COMPARISON BETWEEN HORIZONTAL COUNTERPARTS IN THE SKELETAL CLASSES I, II, III SUBJECTS

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Aim: the aim of the present study was to assess whether the length of the upper cranial structures takes part in the etiology of different sagittal skeletal discrepances of growing subjects.

Methods: from a sample of 1309 teleradiographs obtained from a radiological center, those of patients aged between 12 and 18 years, without previous orthodontic/prosthodontic/implant treatments, were selected for cephalometric measurements in Deltadent software. Subjects were grouped in three skeletal sagittal classes according to ANPg^: Class I (-1° ≤ ANPg^ ≤5°); Class II (ANPg^ >5°); and Class III (ANPg^ <-1°). The measurement of S-N, ANS-PNS, and Go-Me were used to characterize the length of the upper cranial structures, the maxilla, and the mandibole, respectively. Differences in S-N, ANS-PNS, Go-Me measurements between groups were assessed through the ANOVA test. The p-value was set to <0.05.

Results: subjects who met inclusion criteria were 370, including 265 in class I group; 68 in class II group; and 37 in class III group. Age difference between groups was not significantly. When comparing measurement of cephalometric plans between the groups, differences were found in ANS-PNS (p = 0.006) and Go-Me (p <.001) measurements. Instead, no statistically significant difference was found in S-N measurement.

Conclusions: the results of the present study pointed out that the development of sagittal skeletal discrepances is influenced exclusively by the length of the jaws (ANS-PNS, Go-Me), while the length of the upper cranial structures (S-N) does not appear to be involved in this process.

COMBINED ORTHODONTIC SURGICAL THERAPY TO DISINCLUDE TWO INCISORS

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Aim: this study highlights the importance of combined surgical-orthodontic treatment to restore a smile to a patient in a very delicate period of growth, such as preadolescence.

Methods: an "included tooth" is a tooth that is unable to erupt through the gum by remaining partially or completely trapped in the bone, within the physiological time frame. The "timing" of eruption of the upper central incisors should be at about 6-7 years of the upper lateral incisors at 8-9 years.

The 12-year-old patient presented significant esthetic, and therefore psychological, damage due to the absence in the arch of incisors 11 and 12. From in-depth instrumental, opt and CBCT diagnostic investigations, the two incisors were found to be in bony inclusion and in unfavorable position for spontaneous eruption and with fully formed roots. The first step was to place brackets in the upper arch and surgically expose 11 and 12 with vestibular access, by diode laser with continuous light and power 2-3 W. Brackets were finally applied to the two exposed elements.

After about 10 months, the two incisors were aligned with the other dental elements and in proper closure with the lower arch elements.

Results: combined surgical-orthodontic treatment resulted in the resolution of a case with two included incisors in a nearly horizontal position in a 12-year-old patient.

Conclusions: the major success, however, was not the repositioning of two hidden anterior dental elements and dental alignment, but having restored a smile to a growing girl with a markedly improved psychological outcome.

Doi: 10.19256/abstract.cduo.11.2023

USE OF THE PROVISIONAL MAD AS A TOOL TO EVALUATE THE EFFICACY OF OD IN MILD-MODERATE OSAS

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Aim: the aim of the work is to evaluate the efficacy of provisional MAD in patients with mild-moderate OSAS. OSAS is the partial or complete obstruction of the upper airways during sleep, resulting in episodes of apnea/hypopnea followed by arousals. The therapeutic gold standard is C-PAP, which is not always tolerated. In mild and moderate cases, the AASM leaves the decision to use an OD to the doctor and the patient.
Methods: in order to evaluate the therapeutic efficacy of OD, a provisional MAD is used which has a lower cost than a definitive MAD. The provisional MAD is a standardized silicone device that can be customized: it is immersed in boiling water to make it soft, it cools down and it is possible to proceed with the registration of the arches. It is rinsed and finished. The last steps are the assembly and the titration of 50-60% of the protrusive of the patient.
Results: a retentive device is obtained, which guarantees resistance to the opening mouth during sleep. The temporary MAD is used for about 6 months: in presence of satisfactory results, the definitive MAD is created. The 56-year-old male patient came to our Unit for excessive daytime sleepiness. He had class II malocclusion, BMI 25.8, AHI 24.7 at PSG. The creation of a temporary MAD was arranged, to evaluate whether the patient was a candidate for a definitive MAD.
Conclusions: at the next PSG there was a marked improvement in symptoms with reduction of the AHI. It is now possible to proceed to the creation of a definitive MAD.

USE OF "3D SLICER" IN SURGICAL-ORTHODONTIC TREATMENT OF IMPACTED DENTAL ELEMENTS

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Aim: 3D Slicer is a freeware, open-source software for the visualization, processing and 3D segmentation of radiographic images.The aim of this case report is analyzing the potential of this software in planning complex surgical-orthodontic treatment of impacted elements that require a multidisciplinary approach.
Methods: in January 2022, an 8-year-old male patient came to our observation for a surgical-orthodontic evaluation of elements 11 and 12. In the CBCT these elements appeared included, retained, rotated, with 11 palatalized and 12 with major axis almost parallel to the occlusal plane. Once CBCT files were imported into the software, segmentation was performed with the "segmentation editor" module, using the "threshold" function for maxillary upper jaw and "grow from seeds" for the teeth. In order to have a reference of both hard and soft tissues, sections from the CBCT and those from intra oral scan were superimposed to visualize elements 11, 12, 13 (apical to the crown of 12) and the upper jaw individually on the sections and the reconstruction.
Results: thanks to the previsualization and precise localization of the included elements, it was possible to set up a flap exposing elements 11 and 12. Buttons with eyelets were applied on the mesio-vestibular and vestibular surface of 11 and 12 respectively, proceeding with traction of these elements.
Conclusions: 3D reconstruction obtained by segmentation can be influential in decision making and interdisciplinary communication between the oral surgeon and orthodontist, making radiographic investigations easier to be interpretated.

EVALUATION OF MOLARS' CLASS: DIFFERENCE BETWEEN DIGITAL IMPRESSION AND PHOTOGRAPHY

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Aim: in orthodontics is very important to determine the molars and canine class to be able to establish the appropriate treatment plan. The aim of this study is to evaluate the difference perceived between digital impression and intra-oral lateral photos, considering the Angles' malocclusion classification, in particular the relationship between upper and lower first molars.

Methods: this study included two patients with permanent teeth having second molar class according to Angle's classification. The intra-oral lateral photos were taken with a professional photo camera, Nikon D7000, using a ring-flash; while the digital impression was taken with an intraoral scanner, specifically iTero™. Theoretically, lateral photos should be taken perpendicularly to the occlusal plane (directly or with the help of the lateral mirrors). In the real clinical life this is not always possible because of the difficulties pulling the cheek laterally and uncompliant patients.

Results: observing the lateral photos and the digital impression, a difference could be seen. This could be caused by the capability of the clinician to take the photo with the right angle between the occlusal plane and the camera, that should be 90 degrees.

The difference noted consisted of a reduction of the second class in the photos taken by the photo camera in comparison with the real class visible during the clinical examination and with the digital impression.

Conclusions: in conclusion, the photos are not, in some cases, the best way to analyze the molar class relationships.

ORTHODONTIC SURGICAL TREATMENT OF TWO CENTRAL IMPACTED INCISORS. A CASE REPORT

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Aim: impacted tooth is a common occurrence in dental practice, affecting approximately 20-22% of orthodontic patients. Correct diagnosis of impacted tooth is important and requires understanding the normal development of the dentition as well as the most common etiologic factors (local, general and structural). The most common etiological local factors are: cysts, odontomas, supernumerary and traumatic dislocations.

The purpose of this study is to present a clinical case of orthodontic-surgical treatment of two impacted central incisors due to the presence of two large supernumerary teeth that hindered their physiological eruption.

Methods: our healthy patient was observed at the age of 11. The intraoral clinical examination revealed a good level of oral hygiene, no caries and the absence of teeth 11 and 21, with a Class II malocclusion and a deep bite. Radiographically, it was evident how the supernumerary teeth hindered the normal eruption of the corresponding impacted teeth. The supernumerary tooth was extracted and then an orthodontic-surgical treatment started.

Results: the impacted teeth were effectively recovered using a multibrackets therapy and elastic traction.

Conclusions: the treatment of impacted tooth can be a complex issue to resolve and require a multidisciplinary approach. It is important for pediatric dentists and orthodontists to be prepared to diagnose and intercept permanent teeth with ectopic eruption and to collaborate with surgeons in developing a proper orthodontic-surgical treatment plan.

USE OF PUSHING SPLINTS 3 IN A GROWING PATIENT: A CASE REPORT

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Aim: the aim of this case report is to describe the treatment of a dentoskeletal Class III malocclusion in a growing patient.

Methods: a 9-year-old boy came at the Orthodontic Clinic of the University of Naples Federico II for a first consultation. The main complaint were familiar history of Class III and anterior cross bite. From the extraoral view, he showed a concave profile with a retruded position of the anterior dental limit during smile. Intraoral examination pointed out a bilateral Angle Class I with anterior crossbite and absence of transveral discrepancy during early mixed dentition stage. The cephalometric assessment showed a tendency to skeletal Class III. The patient was treated with a Pushing-Splints 3 (PS-3) device for 18 months (16 hours/day). The patient will be followed up during growth.

Results: following interceptive treatment, at the extraoral view the profile was improved. Dento-alveolar Class II (edge to edge) with positive OVJ was achieved.

Superimposition of lateral x-rays showed a good control of the vertical growth pattern and an improvement of the tendency to skeletal Class III.

Conclusions: the PS-3 is a valuable option for the early correction of Class III. Its design provides favorable correction of anterior cross bite, maxillary advancement and adequate control of mandibular divergency.

CLASS III HYPERDIVERGENT: ORTHODONTIC COMPENSATION (EXTRACTIVE/NON EXTRACTIVE TREATMENT)

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The aim of the study is to present two cases of III class in which optimal occlusion was achieved, in compliance with good periodontal health and very satisfactory facial aesthetics. Surgical treatment is usually required to achieve optimal correction of class III disharmony. If the patient refuses surgical treatment, after a careful diagnostic evaluation, a compensatory orthodontic treatment can be used if the conditions allow the achievement of the pre-established objectives.

In this regard, 2 patients presenting III hyperdivergent skeletal class were compared. It was decided to proceed with extraction treatment for one patient and not to perform any extraction on the other.

Orthodontic compensation generally aims to slightly increase the upper perimeter line and reduce the lower perimeter line by acting above all on the torque of the incisors of both arches.

Both patients underwent orthodontic check-ups 10 years after.

CLASS II DIVISION 2 TREATMENT WITH HERBST APPLIANCE AND TWO MINISCREWS: A CASE REPORT

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Aim: class II division 2 is the malocclusion characterized by deep bite, retroclination of maxillary incisors, small and\or retropositioned mandible, showing a strong genetic link and correlation with dental anomalies. Herbst's fixed functional appliance is considered effective to treat class II mandibular retrusion.
This case report's purpose is to demonstrate how it is possible to manage the Herbst's side effects of lower incisors flaring with two miniscrews in a critical situation of anchorage.
Methods: the patient is a 14-year-old Caucasian female presenting a Class II\2 malocclusion with maxillary protrusion, mandibular retrusion, reduced overjet, deep bite, brachyfacial pattern, redundant lips. Significant proclination of the lower incisors is observed (T1 -1/Go-Gn = 107.7°). According to the Cervical Vertebral Maturation (CVM) method, the patient is in CVs 3 stage.
Results: the treatment goals were resolution of the deep bite, correction of the upper incisal retroclination, achievement of class I relationship, prevent further proclination of the lower incisors and improve the facial profile. Therapy involved the use of fixed multibracket appliance (Ovation; Dentsply-Sirona GAC, USA) with Roth prescription extratorque, Herbst appliance and two buccal miniscrews (PSM Medical Solution, Germany) in positions 36-37 and 46-47 ligated with metallic ligatures to the distal loop of a sectional arch 33-43.
Conclusions: the active treatment time was 28 months and, in the end, all goals stated were achieved with an adequate control of the lower incisal positions (T2 -1/Go-Gn = 108°).

TEMPOROMANDIBULAR DISORDERS AND JUVENILE IDIOPATIC ARTHRITIS: SCOPING REVIEW

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Aim: the purpose of current study is to highlight the potential correlation between Temporomandibular Disorders (TMDS) and Juvenile Idiopathic Arthritis. Juvenile Idiopathic Arthritis (JIA) encompasses a wide range of mostly idiopathic autoimmune arthritis which affect growing individuals. Temporomandibular disorders are a diffuse spectrum of diseases which involve temporomandibular joint (TMJ) and associated structures. However, much more need to be defined in order to detect and manage these conditions.
Methods: the current study has been developed in order to overview what it is known about these disorders and their mutual interactions. Have been reported three case report of patients affected by an Undifferentiated form of JIA developed arthritis to TMJs, complaining pain and functional impairments.
Results: after 2 years, the follow-up with combined pharmacological therapies and a modified oral stabilisation appliance shows no objective worsening of the joints' structures. However, the more complex symptomatic management of inflammation highlights the need for further knowledge.
Conclusions: the present study shows that both literature and clinical activity highlights a strong relationship between JIA and TMDs, that can affect the quality of life of children and adolescents.
Diagnosis and management of these conditions are extremely complex, thus additional studies and evidence are needed. However, the need of an interdisciplinary approach between rheumatologists, pediatricians and dentists has been demonstrated.

PHOTOBIOMODULATION TO REDUCE ORTHODONTIC TREATMENT TIME AND PAIN PERCEPTION: A CASE REPORT

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Aim: to demonstrate the effectiveness of PBM in shortening the duration of orthodontic treatment and reducing discomfort to restore aesthetics and function in an adult patient while ensuring optimal compliance.

Methods: a 61-year-old male subject, smoker, in good general and oral health, skeletal class III, left dental class undetectable due to agenesis of 2.2, class I dental on the right, noncontiguous midlines, OVJ 0.7, OVB 2.1, with severe crowding of the upper and lower arch was selected. The G8 tooth expansion protocol was applied with Invisalign® aligners replaced every 5 days. Oblique attachments were used in the anterior sector of the upper arch for incisor tip control during the opening of the space at site 2.2 for subsequent implant-prosthetic rehabilitation. Treatment was accelerated with the Orthopulse™ PBM device (λ: 850 nm) for 5 minutes per day per arch.

Results: at the end of the 9-month treatment, the patient had a class I dental occlusion, good tooth alignment, good aesthetic outcome, normal OVJ and OVB, centered midlines and space recovery for element 2.2 on which implant rehabilitation and placement of a temporary crown were performed.

Conclusions: the Orthopulse™ device has proven effective in accelerating tooth movement, reducing pain and increasing patient compliance. Radiological investigations showed no bone loss. Orthopulse™ can make a major contribution to increasing access to orthodontic treatment by the adult population.

MINISCREW-ASSISTED RAPID PALATAL EXPANDER, TRANSVERSE MAXILLARY HYPOPLASIA, IMPACTED TOOTH

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Aim: the aim is to show a valid treatment of the transverse maxillary hypoplasia using a rapid palate expander anchored to the palatal bone by means of miniscrews, followed by fixed orthodontic therapy for the recovery of an impacted tooth element and resolution of the malocclusion.

Methods: a 15-year-old male patient presented with bilateral crossbite without mandibular shifting, deficit of the transverse diameter of the upper jaw, 17 and 23 absent in the arch, with no space for 23.

The orthodontic case study allowed us to analyse the position of 23, which was impacted, to verify that 17 and 18 were fused, and to plan the therapy with mixed-anchored rapid palate expander with bands and palatal miniscrews, in combination with a unilateral distal slider to distalise the second quadrant. Multibrackets fixed orthodontic therapy then concluded the entire treatment.

Results: the application of the MARPE combined with a distaliser and fixed orthodontic therapy made it possible to correct transverse maxillary hypoplasia in a 15-year-old patient, with resolution of the bilateral crossbite and recovery of the space required in the arch for element 23, thus avoiding any negative effects on the dento-alveolar area.

Conclusions: where a good anchorage is needed, the MARPE appears to be a valid solution for the expansion of the transverse diameter of the maxilla, guaranteeing an optimisation of the skeletal expansion potential of the palate thanks to its mixed anchorage, and allows the patient to be prepared for a more rapid and simplified fixed orthodontic phase.

INTERCEPTIVE APPROACH TO AN ANTERIOR CROSS-BITE THROUGH DELAIRE'S MASK: CASE REPORT

Pezzolla C.

Aim: class III malocclusion is an orthodontic anomaly in which the mandibular arch is in a mesial position relative to the maxillary arch. In most cases of mandibular prognathism, treatment should be postponed until the growth ceases. However early treatment of class III malocclusion can be initiated to improve occlusal relationships and provide a more favorable environment for future growth. The purpose of this study was to present the treatment of a patient with class III malocclusion in mixed dentition, using a Delaire mask.

Methods: the patient was a 10-year-old male, with an anterior crossbite and undeveloped premaxilla. Familiar mandibular prognathism was present. He presents a concave profile and a shorter lower face third. The cephalometric evaluation showed a value of SNA 78.7° (maxillar retrognathism), SNB 83.4° (mandibular prognathism), and ANB -4.7° (Class III malocclusion). It was decided to start the treatment with a Delaire mask fixed on the deciduous molars with an RPE to improve the maxillary's transverse relationships.

The patient worm it 12-14 hours a day.

Results and Conclusions: five months after the beginning of therapy positive overjet and Class I occlusion of deciduous canines and permanent first molars was achieved. The patient used the Delaire mask for additional six months, therefore at the end of the treatment canines and first permanent molars were in half Class I relationship. The patient's facial aesthetics, however, is already significantly improved.

ANTERIOR CROSS BITE OF A SINGLE TOOTH AND INTERCEPTIVE DEVICE: A CASE REPORT

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Aim: the aim of this study is to highlight the importance of an early-stage treatment in a young patient with dental crossbite and deep bite treated with OG.

Methods: the patient at the beginning of the treatment was a 9-year-old female without menarche. Intraoral examination shows that the young girl is in mixed dentition, has I molar class, crossed 2.1, 6 mm OVB, midline deviation, lower dental crowding and upper malpositioned teeth. Extraoral examination highlights the typical "deep-bite" face, with imposing masseters, an elusive chin and the face squared. According to the treatment plan, the patient has to wear OG size 5G for 4 hours during the day while she does exercise for the activation and every night passively. OG helps to prevent the worsening of a malocclusion, to recover space in the arches by guiding the eruption of canine and premolars and to align frontal teeth. Once achieved the correction, OG was worn by the patient only overnight to stabilize the result and guide the eruption of the remaining teeth.

Results: after 1 year of treatment the dental crossbite and deep bite were resolved and the midlines were coincident.

Conclusions: preventive orthodontics through OG represents an important step forward in the field of interceptive orthodontics since is capable of solving most orthodontic problems and facilitating the next phase of treatment.

VERTICAL DIMENSION RESTORATION IN VIEW OF AN ORTHODONTIC TREATMENT WITH HAWLEY RETAINER

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Aim: this case-report assesses the usefulness of a vertical posterior dimension restoration in a grinding patient, in prevision of an orthodontic treatment in order to correct pro-inclination of maxillary incisors.

Management of severe worn dentition in bruxing patients is challenging, since it can lead to occlusal vertical dimension (OVD) loss and lack of space to correct teeth exo-inclination.

Methods: a 26-year-old grinding man sought orthodontic consultation to treat increased OVJ. Clinical evaluation revealed signs of molar surfaces wearing.

After orthodontic check-up, it was decided to increase posterior OVD before alignment treatment by cementing a resin provisional mock-up, made according to a wax model, on 34-37 and 44-47. Then followed cementation of definitive composite onlays.

During every treatment step, electromyographical Teethan® analyses assessed patient's tolerance to the increased OVD: these evaluations allow to control occlusal balance by checking Neuromuscular Equilibrium Index.

Results: a better maxillary incisors proclination is achieved maintaining a Hawley retainer with an elastic chain for 2 months. The final result is stabilized and after 1 year no signs of relapse/muscle discomfort were recorded.

Conclusions: hawley retainer, together with a vestibular elastic chain, is a valid tool to correct excessive dental proclination, while restorative techniques and EMG allow to rehabilitate OVD and avoid overload.

A multidisciplinary approach in orthodontics is needed in order to restore dento-facial harmony, aesthetic stability and neuromuscular balance.

INTERCEPTIVE ORTHODONTIC THERAPY TO IMPROVE AESTHETICS AND RESTORE FUNCTION: A CASE REPORT

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Aim: interceptive orthodontics must employ simple and predictable therapies that can enhance arch shape, face, and function, with aesthetically pleasing and stable long-term results, in order to be effective and efficient. A correct diagnosis is necessary to choose the best timing and course of treatment.

Methods: our young 8-year-old patient's convex profile, reduced lower third of the face, narrow smile, and wide buccal corridors are all visible on extraoral examination. An intraoral examination reveals a class II malocclusion, second division in mixed dentition, with crowding of the arches, deep bite, and palatal tilt of the upper incisors. A second skeletal class with a normodivergent growth pattern and a slight tendency toward hyperdivergence is visible upon examination of teleradiography in latero-lateral projection.

Results: two years were spent on the treatment. Following treatment, the patient shows a harmonious face in both frontal and profile views, with a pleasing smile that is quite broad. She achieved a class I occlusion, showing leveled and aligned teeth, a proper bite, and a correct position of the upper incisors. Although an aligner finishing phase was suggested, it was rejected because the patient and parents were already satisfied with the outcome.

Conclusions: this clinical case serves as an illustration of how interferences can be removed through a minimally invasive, reasoned approach as the result of a thorough diagnosis, allowing nature to express its full potential for growth and development.

LASER-ASSISTED LINGUAL FRENULOTOMY IN 3-WEEK-OLD NEWBORN: CASE REPORT

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Aim: any reduction in lingual movement can result in a functional alteration, such as difficulty in breastfeeding. A short lingual frenulum, also known as ankyloglossia, is a congenital anomaly in which a small portion of tissue, which should have undergone apoptosis during embryonic development, remains on the sublingual surface and anchors the tongue to the floor of the mouth, greatly reducing its mobility. The aim of this study is to report a case of ankyloglossia causing inability to feed. In particular, it concerns a 3-week-old newborn unable to feed properly due to the short lingual frenulum.

Methods: today, surgical treatment is only recommended if ankyloglossia caused breastfeeding problems such as nipple pain and tears, poor latch, and low infant weight gain. In our study, the patient was unable to feed either by artificial or natural breastfeeding. It was therefore decided, after local anesthesia with lidocaine spray, to perform a laser-assisted lingual frenulotomy.

Results: the result obtained in this case was an immediate increased lingual mobility in absence of bleeding. This therefore made possible to restore the correct tongue's function in the act of feeding.

Conclusions: this case report confirms the importance of early diagnosis of ankyloglossia, as the presence of a short lingual frenulum in. newborn is considered a warning sign for potential breastfeeding difficulties.

The surgical correction via frenulotomy must be carried out to allow better lingual mobility in case of difficulties in natural and artificial feeding.

AVOIDING ORTHOGNATHIC SURGERY THANKS TO ALT-RAMEC TECHNIQUE IN A PATIENT WITH UNILATERAL CLEFT LIP AND PALATE: CASE REPORT

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Aim: this case report aims to describe the effectiveness of alt-RAMEC therapy with temporary skeletal anchorage devices (TADs) appliance in solving midfacial retrusion in a unilateral cleft lip and palate patient, and to evaluate its long-term results.

Methods: the patient is a 14-year-old girl with unilateral cleft lip and palate, she was treated with the protocol proposed by Liou, which consists of 7 cycles with 7 days of expansion and 7 days of constriction using a 2-hinged expander, 1 mm per day, alternately.

In this case a double lingual arch with anterior hooks was soldered on molar and premolar bands and 2 maxillary and 2 mandibular temporary skeletal anchorage devices were used indirectly to avoid dental movement.

After the final expansion cycles, the patient underwent 8 months of active maxillary protraction with intraoral elastics (300 g), used 24 hours a day.

Results: skeletal and dental changes were evaluated by cephalometric analysis based on pre- and post- treatment records of the patient. The study demonstrated successful achievement of the case's therapeutic objectives, including the correction of maxillary retrusion, and the maintenance of stable long-term results, which were confirmed through analysis of the patient's 18-year record.

Conclusions: the results indicate that the Alt-RAMEC technique effectively allowed significant and stable maxillary protraction in the patient, ultimately preventing the need for subsequent orthognathic surgery.

RELIABILITY OF GUIDED MINISCREW INSERTION BASED ON LATERAL CEPH AND MAXILLARY STL FILE

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Aim: the anterior area of the palate is widely used as an insertion site for orthodontic miniscrews. These temporary anchorage devices can be placed either directly or using an insertion guide, and various kinds of digital planning and guides are currently available. This study aimed to verify if the guided procedure can guarantee the correct position of the miniscrews on the patient compared with the digital project.

Methods: twenty-five consecutively treated patients were included in the study. Angular and linear displacements of the miniscrews were evaluated among three groups: the planned position, the printed model position, and the achieved position.

Results: the median achieved angle between two digitally planned parallel screws was 6.22 (interquartile range: [4.35, 9.08]) and the difference between the angles in the planning and the achievement groups was significant (P <0.001). Lateral and vertical differences were also found among the three groups.

Conclusions: results show that the examined workflow is clinically efficient. Differences between the digitally planned position of the orthodontic miniscrews, the control position, and the achieved position were detected both for angular and linear measurements but were not clinically significant.

FIRST MOLAR ROTATION WITH ALIGNERS: A REVIEW

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Aim: the aim of this research is to find out if is possible to achieve first molar rotation and its accuracy and predictability.

Methods: the research has been conducted on the following databases: PubMed and Google Scholar. The keywords used were: “first molar rotation”, “molar rotation” and “clear aligners”. The research produced 13 results, of which only 4 articles met the inclusion criteria. Studies published from 2007 to present day were included, while book or book chapters, abstract, editorials were excluded. Age and gender were not considered as exclusion criteria.

Results: although molar derotation is a difficult orthodontic movement, aligners are found to be effective in performing this movement, the predictability was 82% in adult patients and 66% in growing patients. regarding rotational movement, our results reveal that rotation of the first molars is the only movement with excellent predictability, as reported in previous article.

Conclusions: the rotation movement is well performed with clear aligners and has high value of predictability. the inhomogeneity of the results in the studies analyzed can be due to different malocclusion treated and different aligners systematic used.

A LITERATURE REVIEW OF IMPLICATIONS OF SURGERY-FIRST APPROACH FOR OBSTRUCTIVE SLEEP APNEA

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Aim: the recent trend has been the "surgery first approach" (SFA) in which orthognathic surgery is performed without presurgical orthodontic preparation and it is followed by conventional orthodontics. The SFA, compared with the traditional approach, can reduce treatment time and avoid worsening facial esthetics and dental function during orthodontic preparation. Obstructive sleep apnea (OSA) is associated with significant morbidity so it has been gaining more attention from orthodontists. The aim of our research is to evaluate if SFA with maxillomandibular advancement (MMA) can achieve an early improvement of OSA condition.

Methods: a research on PubMed was conducted by using keywords: "Airway", "Surgery-first", "OSA". The eligibility criteria were: the period of publication-since January 2013; articles concerning OSA treated with SFA using bi-jaw advancement orthognathic surgery. Five articles were included in the review.

Results: the SFA with MMA is effective in treating patients with OSA without negatively affecting facial appearance and dental occlusion. It allows early improvement of OSA and reduces the risk of OSA worsening from presurgical orthodontic preparation.

Conclusions: the immediate correction of OSA condition is sometimes required to be the first consideration for the patients, and minor orthodontic treatment can be performed afterwards. However, pre-surgical evaluation is still mandatory with orthodontists to avoid unfavorable result and post-surgical complications. Further studies are needed to confirm these little results.

COMPARATIVE ANALYSIS OF ROOT RESORPTION BETWEEN TOOTH-BORNE AND BONE-BORNE EXPANDERS

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Aim: the aim of the study was to examine tooth-borne (TB) versus bone-borne (BB) rapid maxillary expansion (RME) in terms of external root resorption (ERR) in individuals.

Methods: pre-treatment (T_0) and post-treatment (T_1 = 6 months) CBCT scans of 40 participants who received tooth-borne RME (TB group; average age 13.3 years; 1.10 years) or bone-borne RME (BB group; average age 14.7 years; 1.15 years), were used to assess ERR. 3D reconstructions of the radicular architecture of the maxillary first molars (M1), first and second premolars (P1 and P2) were performed to calculate volumetric changes (mean and percentage values) and shape changes (deviation analysis of the radicular models) between T_0 and T_1.

Results: first molars were the teeth most affected by the resorption process in both groups, with a substantial reduction in radicular volume and length ($p < 0.05$) across the board (volume and palatal root length).

There were no differences between the examined teeth when volumetric radicular alterations were computed as a percentage of the pre-treatment volumes ($p > 0.05$).

According to the deviation analysis from radicular models' superimposition, the apex, and bucco-medial root surface were the areas most affected by shape change. Overall, the ERR in the TB group was considerably higher than in the BB group (mm3: M1 = 3.11, P1 = 1.04, P2 = 1.24) (mm3: M1 = 17.03, P1 = 6.42, P2 = 5.26).

Conclusions: despite the statistical significance, the different amount of ERR found in TB and BB groups remains clinically questionable.

EFFECTS OF MODIFIED SEC III TREATMENT FOLLOWED BY FIXED APPLIANCES IN CLASS III PATIENTS

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Aim: to evaluate the effects produced by the modified SEC III treatment in growing patients with Class III malocclusion followed by fixed appliances in the permanent dentition compared to untreated Class III subjects.

Methods: a retrospective observational longitudinal study was conducted on 40 patients, aged 7-14 years, diagnosed with Class III malocclusion. Cephalometric data were collected at initial (T_0), intermediate (T_1), and final (T_2) check-ups. Patients were treated from T_0 to T_1 with the modified SEC III protocol, and in the second phase of treatment in permanent dentition with fixed appliances. Final records (T_2) were taken at the end of comprehensive treatment. The treated group was compared to untreated Class III subjects. Statistical between-group comparisons were performed with independent sample t-tests in normally distributed data, Mann-Whitney test was used for data not normally distributed.

Results: comparisons at T_0 showed no significant differences. Statistically significant differences were found in the T_2-T_0 interval. In particular, the treated group showed significant increases in SNA (+1.3°), ANB (+1.9°), Wits (+2.0°), SN-Pal Pl (+2.0°) and decreases in Ar-Go-Me (-6.0°), SN-GoMe (-2.3°), Pal Pl-Md Pl (-3.8°) compared to untreated subjects. Moreover, the treated group showed significant decreases in total mandibular length (Co-Gn -5.9 mm).

Conclusions: subjects with Class III malocclusion showed significantly favorable sagittal and vertical skeletal changes after treatment with the modified SEC III followed by fixed appliances in comparison to controls.

RECYCLING ORTHODONTIC BRACKETS: A LITERATURE REVIEW

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Aim: a common problem during treatment is bracket dislodgement. The process of recycling is defined as removing adhesive from the bracket completely to provide the possibility of bracket reuse, without damaging the bracket backing or distorting the slot dimensions. The purpose is to evaluate the efficacy of different methods of recycling brackets and the effects on shear bond strength (SBS).

Methods: the search was conducted on PubMed database, screening results of the last 10 years. Keywords used are: “Orthodontic brackets” AND “recycling”. Among the initial 18 articles, 3 articles were excluded because they do not mention SBS and of those remaining the entire text was read.

Results: 15 articles related to *in vitro* studies were selected. In each, comparisons were made between recycling methods: flaming, sandblasting, adhesive grinding method and Er: YAG laser by using an Electroforce test machine, scanning electron microscopy, confocal laser scanning microscopy and Raman spectroscopy. Er:YAG laser technique and sandblasting method have highest SBS.

The adhesive grinding method using tungsten carbide bur recorded the least SBS. SBS of ceramic brackets processed by flaming and sandblasting was significantly lower than that of new brackets. Instead, ceramic brackets recycled by Er:YAG have higher values of SBS.

Conclusions: as for the metal brackets Er:YAG laser and sandblasting are the most efficient methods for recycling at chairside. Concerning ceramic brackets, only with Er:YAG laser microcrystalline structures were not damaged.

INTERCEPTIVE ORTHODONTICS IN MIXED DENTITION WITH OCCLUS-O-GUIDE: A SCOPING REVIEW

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Aim: the aim of this study was to evaluate the efficacy of the Occlus-O-Guide (G type) appliance in patients in mixed dentition with dentoskeletal Class II malocclusion, deep bite and increased overjet.

Methods: a scoping review of the literature was conducted using the PubMed databases with the keywords "Occlus-o-Guide; Class II malocclusion; interceptive therapy" without time and language limitations.

The search focused on studies that evaluated the effectiveness of the Occlus-O-Guide in the treatment of Class II patients in mixed dentition. Studies that focused exclusively on patients with deciduous and permanent dentition were not included. A total of six articles were identified and included in the final analysis.

Results: the results of the review showed that the effects of the Occlus-o-Guide were primarily dentoalveolar, with a smaller but significant skeletal effect. The study found an increase in mandibular length, lower anterior and total anterior face height, mesial migration of the lower molars and mandibular posterior dentoalveolar height. The upper incisors were lingually tipped and retruded, while the lower incisors were linearly protruded. The maxillomandibular and molar relationships were improved and there was a significant decrease in overjet and overbite.

Conclusions: this review suggests that the Occlus-o-Guide appliance can be a valuable interceptive therapy for Class II malocclusion in mixed dentition, reducing the risk relapse with the potential to avoid the need for a second phase of orthodontic therapy in many cases.

3D PRINTED ALIGNERS AND ERRORS IN THEIR MANUFACTURING WORKFLOW: AN *IN VITRO* STUDY

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Aim: the purpose of this work is to highlight the CAD errors that may lead to differences among different software used to design a 3D printed aligner.

Methods: starting from the same STL file, obtained from a single patient's arch scan, we designed an aligner using seven different software (Geomagic, Meshmixer, D3 Splint, Maestro 4, Maestro 6, Bluesky, 3Shape) and setting the offset at 0 mm and the thickness at 0.5 mm.

After aligning the reference model and all aligners with each other, we used a customized analysis workflow of Rhino software to calculate each aligner's thickness and gap from the model.

Results: generic software (Geomagic and Meshmixer) overall showed the best performance, having high values of thickness accuracy and precision and a minimum gap from the model. Among the dental software, Maestro 4 and Bluesky had thickness values closer to 0.5 mm, while 3Shape was the best one in terms of fitting.

The interproximal spaces proved to be the areas with the most irregular thickness and fitting values.

Conclusions: our study demonstrates that also the CAD stage can lead to errors during the manufacturing of 3D printed aligners. Some differences among the software are statistically significant: it remains to be seen whether these differences are clinically significant.

Future studies are recommended to expand the sample and eventually confirm our results.

PROTOCOLS OF ORTHODONTIC RETENTION AMONG ITALIAN SPECIALISTS AND NON-SPECIALISTS

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Aim: to evaluate retention protocol and procedures, in Italy, among specialists in orthodontics (SP) and non-specialist dentists practicing orthodontics (NoSP).

Methods: a questionnaire on retention consisting of seven topics was developed. The seven parts comprised: background information of the doctor, retention protocol, retention duration, patient follow-up, information given to the patients, need of guidelines, opinion about bonded and removable retainers. The questionnaire was distributed online, via social media, to SP and NoSP practitioners. Statistical analyses included Chi-square test and P was set as <0.05.

Results: almost all participants use some retention after active treatment (99% of SP and NoSP groups). Pre-treatment situations influence the 76% of SP group, for the choice of the retainer, respect the 60% of NoSP group (P = 0.001). Both in upper and lower arch, in case of extraction, SP significantly use more the double retention (fixed and removable), respect NoSPs. For both group the thermoplastic retainer, in the maxilla, is the preferred mean of retention (SP group = 58%; NoSP group = 68%), instead a fixed retainer bonded to all anterior teeth is preferred in the mandible (SP group = 71%; NoSP group = 79%). 5% of NoSp and 12% of Sp had modified their retention procedures because of Covid 19: principally, the SP group increased the use of removable retainers.

Conclusions: SP and NoSP present some similarities in the retention strategies after treatment. Covid 19 had an impact on a limited percentage of practitioners (more SP than NoSp) about retention procedures.

RISK OF MAXILLARY CANINE IMPACTION IN PEDIATRIC PATIENTS WITH BILATERAL SKELETAL CROSSBITE

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Aim: the aim of the present investigation was to assess whether the bilateral skeletal cross-bite is a risk factor for maxillary canine impaction.

Methods: two groups of 13 patients, matched by gender and age, were composed: a study group of patients with bilateral skeletal cross-bite and a control group without bilateral skeletal cross-bite. The average age was 8.6±1.3 years. For both groups inclusion criteria were: age between 7 and 13 years; deciduous maxillary canines in the dental arch. Exclusion criteria were: previous orthodontic treatments; rare genetic abnormalities, syndromic and/or craniofcial conditions, lip and/or palatal clefts; maxillary lateral incisor agenesis. On the panoramic radiographs three risk factors for canine impaction were measured:

- the α angle, measured in degrees (<25° low/moderate risk; >25° high risk);
- the distance *d* from the occlusal plane, measured in mm;
- the overlapping sector *s* (from 1 to 4).

Fisher's test was used to compare the values of the two groups.

Results: the control group's average *d* was 20.1 mm; *s* was 1 for 24 canines and 2 for 2 canines. The study group's average *d* was 19.1 mm; *s* was 1 for 25 canines and 2 for 1 canine. The parameters s and d don't show a statistically significant difference between the two groups.

Setting the significance level at .05, it emerged that the Fisher value relative to α >25° was 0.0098. It was therefore statistically significant.

Conclusions: considering the difference in α angle between the two groups, there is a higher risk of canine impaction in bilateral skeletal cross-bite.

AREA AND VOLUME EQUIVALENCE OF 3D ANATOMICAL MODELS ACQUIRED FROM DIFFERENT OPTICAL SYSTEM

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Aim: stereophotogrammetry and laser scanning are two methods that allow to digitize and measure the palate of patients with cleft lip and palate (CLP). In order to understand if the data obtained is comparable and corresponding, this study aims to verify the repeatability (RTT) and reproducibility (RDB) of the data acquired with the two optical systems.

Methods: through the two systems, 96 casts of 32 unilateral CLP children were digitized (impressions were taken 3 different times for each patient). Volume (V) and area (A) of cleft area were measured with Vectra 3D Analysis Module (VAM). One validated protocol (automatic) was used for A measurements, while two validated protocols (automatic and semi-automatic) were used for V. For A and V and for all protocols, inter- and intra-operator RTT and inter-instrument RDB were verified through the following measurements: Technical Error of Measurements (TEM), relative TEM (rTEM) and Bland-Altman test.

Results: inter- and intra-operator RTT was higher for area than for volume. rTEM measurements (intra operator: 19.1%; inter-operator: 18.8%) showed that protocol 1 for V measurement was unreliable.

According to inter-instrument RDB results: A was highly reproducible (87%) with low bias; V protocol 1 was not reproducible with high biases; V protocol 2 was poorly reproducible (<46%) with acceptable biases.

Conclusions: the values of A are comparable and therefore equivalent. The values of V depend on the system used. More research needs to be done to identify a standard protocol.

EFFECTS OF MAXILLARY EXPANSION IN CLASS III PATIENTS WITH OR WITHOUT UNILATERAL CLEFT LIP

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Aim: to evaluate changes after treatment with a bonded maxillary expander in growing patients with Class III malocclusion with or without unilateral cleft lip and palate (UCLP).

Methods: the study sample included 51 patients (mean age 10±2.5 yrs), 21 with UCLP (11F-10M), and 30 without UCLP (19F-11M) both treated with a bonded maxillary expander. The digital dental models and lateral cephalometrics were collected before (T_0) and after maxillary expansion (T_1) then imported into the Viewbox4 software. Chi-square test was used for gender data in the two groups, descriptive analysis of data pre- and post-orthodontic treatment and evaluation of the differences between the two groups were performed with the t-test for independent samples. The p-value <0.05 was considered statistically significant.

Results: the comparison between T_0 and T_1 did not show statistically significant differences between the diameters of the upper arch, except for the value between the second premolars at the gingival level. The comparisons of the cephalometric values showed significant results for SNA and PNSA, demonstrating maxillary advancement in the group without UCLP. Moreover, I^SN was statistically significant both at T_0 and T_1 in the two groups.

Conclusions: growing subjects with UCLP showed improvement in maxillary arch morphology after treatment with the bonded expander. The comparison of post-treatment results with a control group without UCLP showed no significant differences. Cephalometric values showed greater jaw advancement and less buccal inclination of upper incisors in patients with UCLP.

SKELETAL EXPANSION USING MARPE IN A 50-YEAR-OLD PATIENT: A CASE REPORT

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Aim: this case report describes the treatment of an adult female patient (50-year-old) with transverse deficiency and bilateral cross-bite.
This study aimed to evaluate the dento-skeletal results obtained with a miniscrew-assisted rapid palatal expander (MARPE) on 4 miniscrews, followed by fixed orthodontic treatment without orthognathic surgery.
Methods: the MARPE appliance consisted of a conventional Hyrax expander anchored to 4 orthodontic miniscrews. The exact location of the miniscrews was determined with virtual planning software.
Cone-beam computed tomography (CBCT) scans were superimposed on the maxillary digital model, and 3-dimensional-printed surgical guides were used to accurately position the mini-implants.
A slow expansion protocol was used, and the appliance was held in place during the entire treatment (almost 20 months).
Results: the treatment was completed in 20 months. After removing the appliance, the post-treatment CBCT, panoramic radiograph, and cephalogram were taken with the MARPE appliance still in place. Pre-treatment, post-expansion, and post-treatment CBCT scans show the parallel expansion obtained without dental torque compensation or bite opening. The post-treatment scan showed that a long period is required to complete the midpalatal suture mineralization.
Conclusions: MARPE has proven effective in correcting transverse discrepancies, even in adults. However, post-treatment CBCT imaging showed incomplete ossification of the midpalatal suture, demonstrating that the retention period should be extended in some adult patients.

COMBINING INVISALIGN® SYSTEM AND LOWER INCISOR EXTRACTION: A CASE REPORT

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Aim: resolution of crowding with lower lateral incisor (4.2) extraction and use of Invisalign® aligners.
Methods: a 24.3-year-old male patient, in good general and oral health, non-smoker, skeletal and dental class I, normodivergent, with increased OVB, increased interincisal angle, severe anteroinferior crowding and mild contraction of the upper middle sectors, has been selected. The 18-month treatment plan included 4.2 extraction and resolution of the malocclusion with the Invisalign® aligners. Standard attachments have been used, allowing extraction space closure through distalization of 4.1 and mesialization of 3.1, 3.2 and 4.3. In the upper arch, dentalveolar expansion of the middle and anterior sectors was performed by the use of optimized attachments. Power ridges have been used to correct torque in the anterior sectors. Interproximal enamel reduction had to be performed to complete the alignment. The Treatment was concluded with a customised bonded Memotain® NiTi CAD/CAM Retainer.
Results: at the end of the treatment, the patient achieved good dental alignment with crowding resolution and extraction space closure, corrected OVB and OVJ, improved interincisal angle, Little's irregularity index less than 1, harmonic arch forms, a good aesthetic result despite the loss of inferior symmetry.
Conclusions: the clear aligners were adequate to solve severe crowding, with a lower incisor (4.2) extraction technique, restoring proper arch forms and tooth relation.

OROFACIAL PAIN, MULTIPLE SCLEROSIS AND OSAS: MANAGEMENT OF A COMPLEX CASE

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OSAS and multiple sclerosis share numerous signs and symptoms such as fatigue, cognitive dysfunction and reduced quality of life. Although studies are still scarce, the results agree that patients with multiple sclerosis are more susceptible to developing respiratory disorders. Dentists have an important role in both diagnosis and construction of a multidisciplinary path that takes into account risk factors common to OSAS and its comorbidities.

To maximize the chances of therapeutic success, dentists must be aware of the therapies that can be associated with mandibular advancement, whether they are of dental or multidisciplinary relevance.

PEDO-ORTHO MANAGEMENT OF A GROWING PATIENT WITH CARIES RECEPTIVITY AND POOR ORAL HYGIENE

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Aim: the purpose of the work is to describe the orthodontic treatment of a growing male patient with a poor oral hygiene, high caries receptivity, previous incongruous dental treatments in a mixed dentition with palatal contraction, crowding and skeletal class II.

Methods: a 12 year-old patient came to visit at dentistry department of San Raffaele Hospital. The visit highlighted a poor oral hygiene, high caries receptivity, previous incongruous dental treatments in a mixed dentition with palatal contraction, crowding and skeletal class II. After a valuation, some deciduous elements were extracted.

The treatment plan was formulated with rapid palatal expansion and maintenance of the Leeway space through a lingual arch.

In permanent dentition treatment with Invisalign® with an MA protocol was undertaken to simultaneously correct skeletal class II, align the smile, and maintain better oral hygiene.

The last aligners of the series had to be used at night to allow spontaneous eruption of the posterior sectors.

The ultimate part of the treatment was a refinement of dental alignment.

Results: there was a complete resolution of the malocclusion and, thanks to the cleaning motivation of aligners, there was an improvement of oral hygiene habits.

Conclusions: clear aligners helped to improve the course of the orthodontic treatment of a highly carioreceptive patient, also improving his habits.

FUNCTIONAL TREATMENT OF POSTERIOR CROSSBITE AND INCREASE IN INTER-ARCH DISTANCES

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Aim: posterior crossbite (PC) is a severe malocclusion associated with maxillary hypoplasia and masticatory dysfunction. We previously reported that the appliance Function Generating Bite (FGB) effectively corrected the altered mastication. This study aims to evaluate the dental effects of PC treatment in mixed dentition with FGB on the transverse dimension of the dental arches.

Methods: this study included 84 PC patients, F = 46; M = 38; mean age 8.2±1.8 [yr.mo], and 69 control patients (C), F = 31; M = 38; mean age 8.9±1.4 [yr.mo]. Measurements were taken with digital calipers on maxillary and mandibular study casts, before (T_0) and after the correction of the malocclusion (T_1): inter-molar distance (IMD), inter-molar gingival distance (IMGD), inter-canine distance (ICD) and inter-canine gingival distance (ICGD).

Results: at T_0, there was a highly significant difference in all maxillary measurements between PC and C ($p < 0.001$), reflecting maxillary hypoplasia in PC. At T_1, there was no difference between the groups. In PC, the mean increase between T_0 and T_1 for IMD was 4.34±2.42 mm, for IMGD was 3.51±2.19 mm, for ICS was 2.78±2.37 mm and for ICGD was 1.89±1.7 mm ($p < 0.001$). There was no significant difference in mandibular measurements at T_0 and T_1.

Conclusions: functional therapy with FGB effectively significantly increases the transverse dimension of the maxillary dental arch in PC.

Considering its efficacy in treating masticatory dysfunction, FGB is a good treatment option for correcting PC in growing children.

ORTHODONTIC MOVEMENT IN SELF-LIGATING SYSTEM THROUGH INTRAORAL SCANNER: A CLINICAL STUDY

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Aim: is to evaluate orthodontic movement obtained by Damon protocol arches in the upper jaw using an intraoral scanner.

Methods: the patients included in this study were bonded with WEPASS self-ligating system with MBT prescription in the U.O.C. of Orthodontics Policlinico Umberto I. 10 patients were selected and 8 completed the study.

Overlapping scans were chosen in addition to simple linear measurement of intercanines and intermolar distance in three different time with two consecutive types of archwires (AWs). Vestibular-oral (V-O), mesio-distal (M-D), and vertical (V) movements of teeth were evaluated. Data were analyzed with ANOVA test.

Results: no statistically significant difference was found between the difference of intercanine and intermolar distance for both AWs. ANOVA test confirmed the significance of three-dimensional movements with each arch-wire: for the 0.014-inch NiTi AW, V-O movement was prevalent, followed by M-D and V; for the 0.014x0.022-inch NiTi AW vestibular-oral and mesio-distal movement prevailed.

Conclusions: orthodontic movements corresponded to expectations: 0.014-inch NiTi AW is useful for alignment and levelling, while 0.014x0.022-inch NiTi AW, is useful to finalize alignment and to initial torque control. The use of intraoral scanner could be considered a valid monitoring tool to evaluate teeth movement during orthodontic treatment.

ECTOPIC ERUPTION OF THE PERMANENT MOLAR AND ROOT RESORPTION OF THE SECOND PRIMARY MOLAR

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Aim: ectopic eruption represents the eruption of a tooth in an abnormal position. The most frequently found ectopic teeth are the maxillary first permanent molars. Generally, the ectopic first molars are impacted under the distal roots of the deciduous second molars. The aim of this study is to determine the frequency of occurrence of the ectopic eruption of the first permanent molars and its correlation with the deciduous second molars root resorption.

Methods: the authors performed a literature review of the PubMed and Scopus databases with no language or time range limitations to identify publications related to the topic. Literature search was performed using combination of the following keywords: "primary second molar" AND "root resorption" AND "ectopic first molar". The first selection involved 19 citations. After further assessment of relevance, 7 articles were selected for the review process.

Results and conclusions: the mean prevalence rate of ectopic eruption of the maxillary first molars reported is 2-6%. The anomaly occurred unilaterally in 36% of cases and bilaterally in 64%.

No pain is associated with this condition and the diagnosis is generally made by premature exfoliation of the primary second molar or routine radiographic examination.

Two types of ectopic eruption of the first molar have been distinguished:

- reversible: the trajectory self-corrects spontaneously and the first molar erupts in a normal position.
- Irreversible: the ectopic molar remains impacted against the deciduous second molar.

Among the first ectopic molars analyzed, 70% were self-corrected and 30% remained impacted.

ALTERATIONS OF ORAL MICROBIOTA WITH CLEAR ALIGNER AND FIXED APPLIANCE: A LITERATURE REVIEW

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Aim: to investigate how orthodontic treatment with fixed appliances or clear aligner influence the oral microbiota and to report differences.

Methods: the research was led on PubMed. The following keywords were used: "oral microbiota", "Orthodontic treatment", "Clear aligner" and "fixed appliance".

PICO's method was applied:

1. population: patients on orthodontic treatment with CA.
2. Intervention: swab for microbiota research.
3. Control: patients on orthodontic treatment with FA.
4. Outcome: data of oral microbiota.

Inclusion criteria:

- Randomized, retrospective studies and reviews on permanent dentition patients.
- Studies proven by microbiological samples.

Exclusion criteria:

- Case report and other type of studies.

Results: of the 49 articles analyzed, 3 articles met the inclusion criteria. The articles affirm that patients receiving orthodontic treatment show qualitative and quantitative differences in the oral microbiota compared to untreated subjects, induced by increased retention of supra and subgingival bacterial plaque throughout the treatment period.

TBL (total bacterial load) increased in the FA group but not in the CA group, while the levels of the individual periodontal pathogenic bacteria species did not significantly increase during the observation period.

Conclusions: the type of orthodontic appliance could influence the subgingival microbiota. Removable clear appliance has less influence on the oral microbiota than the fixed ones.

ANALYSIS OF MANDIBULAR ARCH IN PATIENTS TREATED WITH LIP BUMPER USING 3D CASTS

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Aim: the aim of this retrospective observational study is to assess changes in the lower dental arch after Lip Bumper treatment using 3D digital casts and appropriate software verifying the appropriateness of this method.

Methods: a retrospective case-control study was conducted. Patients with mild or moderate crowding treated with Lip Bumper were enrolled. The data were collected before (T0) and after the Lip Bumper treatment (T1). Digital dental casts were obtained using the intraoral scanner iTero 5D Element (Align Technologies, San Jose, California, USA) and the STL files were transferred to the OrthoCAD software. For each digital cast, arch length and perimeter, intercanine, interpremolar, intermolar widths, crowding and molar rotation were measured. The cephalometric analyses were carried out for each radiograph to obtain the mandibular incisor inclination mensuration (IMPA). The data of the Control Group (CG) derived from a previous study and was paired for age, maturation of cervical vertebral, gender and period of observation with Treated Group (TG). The mean and standard deviation were calculated for the continuous variables considered. The comparison between the continuous variables at T0 and T1 were calculated with the t-test, and the level of statistical significance was set at $p < .05$. To analyze changes in the measurements between Treatment and Control Groups over the two-time points were used repeated measures from ANOVA.

Results: the Treated Group included 28 digital dental casts and lateral cephalometry of 12 female and 16 male patients (aged 9-13 years). The analysis of the data showed, in the TG, an increase in widths in the intercanine (2.42±5.93 mm), in the interpremolar (3.02±2.55 mm) and in the intermolar (2.57±3.61 mm) regions, while in the CG an important decrease of the same measurement was found. Results reported a crowding reduction of 3.37±0.09 mm and a change in molar rotation from 33,58° to 22,53°, both significantly different from the Control Group. In Treated Group, T1-T0 arch length and perimeter have an increase respectively of 0.37 mm and 1.83 mm, without being statistically significant ($p = .168$; $p = .667$). The value of the IMPA T1-T0 was not statistically significant ($p = .762$) between the two groups.

Conclusions: digital dental casts and 3D software, used to analyze arch changes, were confirmed as a valid and efficient system to evaluate the effects of treatments and compare results. The outcomes confirm the hypothesis that the Lip Bumper allows an increase in the transverse dimensions of the lower arch while respecting the inclination of the lower incisor. These changes allow a gain of space in the lower arch to resolve dental crowding.

CLASS II MALOCCLUSION THERAPY WITH REP II SYSTEM AND HERBST APPLIANCE IN GROWING PATIENTS

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Aim: to evaluate the efficacy of Rep II System compared to Herbst appliance and control group in class II skeletal malocclusion growing patients.

Methods: 13 Class II patients treated using the Rep II System (Group R) were compared with 13 patients treated with Herbst appliance (Group H) and with 13 Class II untreated children (Group C). The Rep II System included a Hyrax expander with two arms extending to the canine and a lower clear aligner with hooks on deciduous second molars. Cephalograms were compared at the start (T0) and after 24 months (T1). The following measurements were analysed: SN-PO, LFH (LOWER FACE HEIGHT), COGN, IMPA, OVERBITE, OVERJET, ANB. Wilcoxon test and variance analysis with Tukey post hoc correction were performed.

Results: post hoc Tukey's test showed statistically significant differences as follow:

1. SNPO: R >2.775°C, H >6.373° C, H >3.598° R;
2. LOWER FACE HEIGHT: R <5.467 mm C, H >4.13 mm R;
3. COGN: R <4.335 mm C, H >3.94 mm R;
4. IMPA: H >5.739° C, H >6.4° R;
5. OVERBITE: H <- 2.19 mm C;
6. OVERJET: R <3.59 mm C, H <4.83 mm C;
7. ANB: R <2.15° C, H >1.47° R.

Conclusions:

- the R group had a smaller lower incisors proclination, a lower occlusal plane inclination, a decreased ANB angle, a decreased mandibular length and a decreased lower facial height compared to H group;
- the R group had a decreased mandibular length and lower facial height, overjet and overbite reduction and a greater occlusal plane inclination compared to C group;
- the H group showed a greater occlusal plane inclination and lower incisors proclination, overjet and overbite reduction compared to C group.

The Rep II System seems to have better control of vertical effects and lower incisors inclination compared with Herbst appliance.

Both devices are effective to correct class II skeletal malocclusion in growing patients.

PROPOSAL OF A RELIABLE AND REPRODUCIBLE HORIZONTAL REFERENCE PLANE IN 3D CEPHALOMETRY

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Aim: this preliminary study aims to identify in the literature the most reliable horizontal plane in 3D cephalometry to evaluate alterations and asymmetries of the maxillofacial complex and to compare it with results from anthropometric analysis performed on stereophotogrammetry.

Methods: a PubMed literature review was conducted to find all horizontal planes proposed in 3D cephalometry from January 2000 to September 2022. The following keywords: "3D cephalometric landmarks", "3D cephalometry", "horizontal plane and/or 3D cephalometry". The selected planes were then set up in a dedicated software (SimPlant O&O, Lueven, Belgium). A sample of patient (age 18-55y) with an angioCT taken between January 2019 and May 2022 was selected from the Neuroradiology Department database of the Maggiore Hospital in Parma, Italy; only subjects whose CT scans did not show bone pathology of any kind were chosen. Using SimPlant O&O, 3D skull reconstructions were obtained from angioCT and planes traced. Stereophotogrammetry was then performed on these subjects, using Polishape 3D scanner technology (Face Shape 3D MaxiLine, Bari, Italy); anthropometric analysis was conducted on these shots by an expert operator. The results of 3D cephalometry were compared with those from the anthropometric analysis to determine which 3D plane was most reliable in identifying facial symmetry.

Results: currently, 12 of 22 horizontal plans were found in literature analysis have been used in the 3D cephalometric software.

Conclusions: the statistical analysis of the data is in progress.

MANDIBULAR SYMPHYSIS' SHAPE VARIATION DURING GROWTH: A GEOMETRIC MORPHOMETRIC ANALYSIS

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Aim: the aim of the present paper was to evaluate the morphology changes of the mandibular symphysis (MS) in a longitudinal retrospective cohort of class II untreated subjects.

Methods: the study sample included 120 subjects followed during normal growth and examined at the age of 12 (T0) and 15 (T1) years. MS was traced using two landmarks and ten sliding semi-landmarks. The acquired morphological data were processed via Procrustes superimposition that allowed to study variation and covariation in MS'form according to specific variables such as age, gender, and skeletal pattern.

Results: the first two principal components (PCs) described more than 90 % of the total morphological variation. Both types of form changes of the symphysis could be associated with the different skeletal vertical growth patterns. Age and sex did not interfere with the form of chin symphysis. Moreover, there was no significant covariation between initial MS morphology and form modifications.

Conclusions: clinicians should not expect to be faced with spontaneous changes of the form of the symphysis during the orthodontic treatment of adolescents.

LONG-TERM STABILITY: IMPORTANT GOAL OF ORTHODONTIC TREATMENT

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The purpose of the following work is to evaluate the stability and maintenance of orthodontic treatment over the years.
To achieve long-term occlusal stability it is important to achieve a mutually protected occlusion, in which the posterior teeth protect the anterior teeth in the position of maximum intercuspidation and the anterior teeth protect the posterior ones in eccentric movements. The canine guide allows the disclusion between the dental arches in laterality movements, while the incisive guide allows, in the protrusion movements of the jaw, the dislocation of the cusps of the posterior dental elements.
In addition, it is essential to formulate a correct diagnosis and identify the problems underlying the malocclusion itself. It is necessary to respect the 6 keys of Andrews, which concern the interarched relations, the angle of the crowns (tip), inclination (torque), rotation of dental elements, contact points and occlusal plane (Spee curve).
From a gnathological point of view, it is important that there is a health of the temporomandibular joints.
Finally, the orthodontic retention phase should last as long as possible.

CLEAR ALIGNERS AS ALTERNATIVE TREATMENT TO CORRECT DEEP BITE

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Aim: the purpose of this review is to analyse the effectiveness of clear aligners in the treatment of deep bite, as an alternative to fixed multi-bracket treatment.
Methods: an electronic research was performed using PubMed and Scopus databases, using keywords: “orthodontics” AND “clear aligners” AND “deep bite” AND “techniques”.
Results: from the initial search resulted 34 articles, from which, according to inclusion and exclusion criteria, only 4 have been selected.
The first investigated the predictability of deep bite correction using clear aligners concluding that aligner treatment showed 33% overbite correction and additional refinement treatments are needed in most patients with a deepbite.
The second investigated different intrusion patterns of clear overlay aligners and the corresponding orthodontic forces, concluding that Aligners with different intrusion patterns exert different forces, based on shape and position of the attachment and relative movement of the adjacent teeth.
Two studied the efficiency of aligners with bite ramps, one of them also comparing clear aligners with bite ramps and fixed appliances. Both concluding that the use of bite ramps represents a valid option for a successful treatment.
Conclusions: from this review results that clear aligners can represent an alternative for deep bite treatment. Although, since treatment’s outcome do not appear to be very predictable with clear aligners only, further studies are needed.

OBSTRUCTIVE SLEEP APNEA SYNDROME ANALYSIS USING STEREOPHOTOGRAMMETRY: A SISTEMATIC REVIEW

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Aim: obstructive sleep apnea syndrome (OSAS) is a disorder characterized by nocturnal breathing interruptions due to upper airway obstruction.
The aim of the review is to verify the existence of any current literature concerning the craniofacial stereophotogrammetric evaluation in order to predict the presence and severity of OSAS. This technology uses a three-dimensional model obtained from multiple frames of the face taken from different angles.
Methods: the research was performed on MEDLINE-PUBMED without applying temporal or linguistic restrictions. From 19 studies, 4 were selected.
Results: the study of Banabilh et al. 2009 shows how the severity of OSAS depends on the deposition of submandibular fat, neck circumference and body mass index. According to the study of Lin et al. 2018 numerous measurements concerning areas, volumes and anthropometric lines of the head and neck district indicate the presence and severity of the pathology. In the study of Ohmura et al. 2022 it has been demonstrated that mandibular width, length, depth and width-lenght angle are correlated with OSAS severity. In the study of Tyler et al. 2022 emerged that an increasing obtuse angle of facial convexity is found in severe OSAS subject.
Conclusions: in this review emerged a correlation between OSAS severity and submandibular fat deposition, neck circumference, body mass index, facial convexity as well as numerous anthropometric parameters from the literature. It should be note the limited amount of scientific material currently available in this regard.

A NARRATIVE REVIEW OF THE EFFECTS OF FR-3 IN THE TREATMENT OF CLASS III MALOCCLUSIONS

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Aim: the Fränkel function regulator III appliance (FR-3) is used to treat skeletal Class III malocclusions during early mixed dentition stage.
This study aims to assess the effectiveness of the FR-3 to correct Class III malocclusions.
Methods: a review was conducted on PubMed and Scopus databases using the keywords “Fränkel” AND “malocclusion” with no time range limitations.
Of the 210 articles resulting from the PubMed research, only 7 have been chosen since the others were not pertinent to the specific argument of this review. Of the Scopus 209 articles, only 1 has been chosen because the others were either not relevant or had already been included in the PubMed selection. A total of 8 articles have been selected for this review.
Results: although the FR-3 has been used for many years to correct Class III malocclusions, there are many conflicting opinions regarding this device and its long-term effects have not actually been proven.
The goal of the FR-3 was to act on both the mandible and the maxilla, stimulating the development of the maxilla and restricting mandibular growth by counteracting the forces of the surrounding muscles. Some studies have demonstrated that with the FR-3 there are significant effects on either the mandible or maxilla but not on both as was the primary objective.
Four of these studies stated that the greatest effects of the FR-3 occur in the upper jaw, stimulating the development of the maxilla, with an increase of SNA. In contrast of this, the other four articles considered that the FR-3 appliance produced effects mainly from backward and downward rotation of the mandible (with a decrease in the SNB angle) and linguoversion of the mandibular incisors. In all the studies at the end of the treatment, an increase of the ANB angle and of the overjet was found, with a correction of the Class III malocclusions.
Conclusions: there are currently few studies available in literature and, therefore, more studies would be needed to clarify the actual effectiveness of the FR-3 to correct Class III malocclusions.

A REVIEW OF THE CORRELATION BETWEEN HERBST-MULTIBRACKET APPLIANCE AND GINGIVAL RECESSION

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Aim: Herbst-Multibracket appliance (Herbst-MBA) is a possible treatment for Class II malocclusions.
The literature is controversial regarding if the Herbst-MBA can produce gingival recessions (GR) and the aim of this review is to assess the association between GR and Herbst-multibracket appliance (Herbst-MBA) treatment.
Methods: a scoping review was conducted on PubMed database searching the keywords "Herbst" AND "Gingival" with no time range limitation. Of the 12 results from this research, only 8 have been chosen since the others were not pertinent to the specific argument of this review.
Results: this review highlighted that GR after Herbst-MBA treatment occurs mainly on the first premolars and on the lower incisors (for the protrusion and proclination).
Although in most of these studies the presence of GR has been demonstrated after Herbst-MBA treatment, their etiology is multifactorial and their presence were too small to be significant.
Despite that, the study of Batista, Klaus Barretto Dos Santos Lopes et al. proposed Herbst appliance with skeletal anchorage to counteract the possible development of recessions after treatment with Herbst-MBA with dental anchorage.
Conclusions: unfortunately, the majority of available studies only evaluated rather selected patient cohorts fulfilling specific, fairly strict inclusion criteria.
Further studies are needed to clarify the correlation between GR and Herbst-MBA.

PERIODONTAL CHANGES AFTER TOOTH-BORNE OR BONE-BORNE RME: A PARALLEL COHORT STUDY

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Aim: this parallel cohort study evaluated the effects on periodontal (hard tissues) structures of tooth-borne (hyrax) and computer-guided miniscrew-supported rapid palatal expansion appliances.
Methods: 36 subjects were randomly allocated into 2 groups. Group A received treatment with hyrax appliance, while Group B was treated with a computer-guided miniscrew-supported skeletal RME appliance. The same type of expansion screw (10 mm; hyrax click) and the same protocol were used. In Group B, 4 miniscrew were inserted in the paramedian and parapalatal position, using a surgical guide. Periodontal changes (hard tissues) were compared on pre- and post-treatment CBCT images (6-months). The mean differences were analyzed using a Student's t test (significance set at $P \leq 0.05$).
Results: in group B the results showed a slight reduction of buccal and palatal thicknesses at the level of the maxillary first molars (0.15 mm), except for distobuccal thickness level of the first molar with a mean reduction of 0.5 mm. In contrast in group A, there was a greater loss of buccal bone thickness (0.3 mm) with a statistically significant difference on the right side (MBR, $P = 0.02$; DBR, $P = 0.02$). These results are in agreement with other studies, the loss of buccal bone thickness in patients treated with a tooth-supported expander could be caused by the force applied on the maxillary first molars through the orthodontic bands.
Conclusions: according to this study tooth-supported expanders cause a greater reduction of the buccal bone thickness of the maxillary first molar at 6-month follow-up.

LONG-TERM EFFECTS PRODUCED BY RME/FM: A MULTICENTER RETRO-PROSPECTIVE CONTROLLED STUDY

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Aim: to analyze the short- and long-term skeletal effects produced by rapid maxillary expansion and facemask (RME/FM) therapy in growing patients with Class III malocclusion.

Methods: a sample of 44 Class III patients (27 females and 17 males) treated with RME/FM was collected at the University of Florence, the University of Rome Tor Vergata, Italy and at the University of PUC Minas Gerais, Brazil. For all patients lateral cephalograms were available at pretreatment (T0 8.1±1.8 ys), posttreatment (T1 9.8±1.6 ys) and long-term observation (T2 19.5±1.6 ys). A matched control group of 17 untreated Class III subjects (12 females and 5 males) was selected. Between-group statistical comparisons were performed with ANCOVA using the values of the cephalometric variables at T0 as covariates.

Results: no statistically significant differences for any of the cephalometric variables were found at baseline (T0). In the short-term interval (T0-T1) the treated group exhibited significant improvements of ANB (+ 2.9°, P <0.001), Wits (+2.7 mm, P <0.001), SNA (1.8°, P <0.001) and SNB (-1.1°, P = 0.002). A significant closure of the CoGoMe angle (-1.3°, P = 0.031) associated with smaller increments along Co-Gn (-2.4 mm, P <0.001) was also found. In the long-term interval (T0-T2), significant improvements of ANB (+2.6°, P <0.001), Wits (+2.7 mm, P = 0.001) and SNB (-1.7°, P = 0.021) were recorded. A significant closure of the CoGoMe angle (-2.9°, P = 0.006) was also found. The prevalence rate of unsuccessful patients in the long term was 25%.

Conclusions: facemask therapy was effective in improving Class III sagittal skeletal relationships in the short-term and it remained stable in the long term due mainly to favorable mandibular changes.

ACCURACY OF ORTHODONTIC MODELS FOR CLEAR ALIGNERS. ANALYSIS OF 3D PRINTING TECHNOLOGIES

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Aim: the study aimed to evaluate the accuracy of orthodontic models obtained from crowded and spaced dentition and used to create clear aligners.

Methods: two digital master models were obtained from two patients, one with crowded teeth (CM group) and one with edentulous spaces (DEM group). The 3D printers assessed were: Asiga Pro 4K65 (DLP, high-professional), Anycubic Photon M3 (LCD, entry-level), Form 3B (SLA, medium-professional), and Vector 3SP (SLA, industrial). To evaluate the accuracy, each 3D printed model was scanned and registered into the master digital model. Afterward, models underwent digital deviation analysis and the discrepancy (accuracy error) between the master model and scanned model was calculated as root mean square (RMS), All data were statistically analyzed.

Results: SLA 3D printers showed lower trueness error than DLP/LCD ones in both the CM and DEM groups (p <0.001). Anycubic Photon M3 entry-level printer has the highest trueness error (p <0.001). Statistically significant differences were only discovered for the DLP/LCD printers when comparing CM and DEM models made with the same 3D printer (p >0.05). Asiga Pro 4K65 demonstrated lesser precision error compared to the other 3D printers tested. The accuracy error was within the clinically acceptable range to produce clear aligners (<0.25 mm), with the entry-level 3D printer almost reaching this value.

Conclusions: different 3D printing technology and anatomical characteristics of dental arches can affect the accuracy of orthodontic models made for clear aligners.

3D PATIENTS MERGING DIGITAL DENTAL CASTS IN FACIAL RECONSTRUCTIONS

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Aim: this study aims to verify the accuracy of matching digital dental casts on facial stereophotogrammetric images.

Methods: the study sample was composed of 9 adult Caucasians with full dentition and Angle class I. For each patient, a facial sterephotogrammetry (Vectra-3D, Canfield Scientific Inc., Fairfield NJ, USA) with open mouth and dental impressions were recorded. The maxillary dental casts were digitized by laser scanning; afterwards, the files were imported in the Vectra software and matched on the 3D facial scan. Using Vectra software, the digital 3D coordinates of facial (N: Nasion; Ftr: frontotemporale right, Ftl: frontotemporale left) and dental (I: inter-incisor; Pr, Pl: tip of the mesio-vestibular cuspids of right and left first permanent premolar) landmarks were obtained. Said landmarks were also identified directly on each subject using a 3D computerized digitizer (3Draw, Polhemus, Colchester, VT). Seven linear measurements were made between the occlusal plane (Pr-I-Pl) and the facial landmarks (Ftr-N-Ftl). The data obtained by the two imaging systems was compared using paired Student's t tests, mean absolute difference (MAD) and the technical errors of measurement (TEM).

Results: out of the seven analyzed distances, two (Ftl-I and N-I) showed systematic errors ($p < 0.05$). All MADs and TEMs resulted to be <1.5 mm.

Conclusions: it is feasible to superimpose 3D stereophotogrammetric images of facial tissues and digital dental casts using facial landmarks as a reference. To prevent imprecise measurements, however, more accurate dental landmarks should be selected.

NEED FOR ORTHODONTIC RETENTION PROCEDURES: EVALUATION OF PATIENTS AWARENESS AND COMPLIANCE

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Aim: the aim of this study was to evaluate awareness and literacy about the need for retention procedures among patients who underwent orthodontic treatment, and their compliance with the prescribed retention instructions.

Methods: an anonymous 27-items survey was developed with the help of Google Forms and spread through social media among patients older than 18 who finished the orthodontic treatment. The items were grouped in 3 sections: (1) sociodemographic characteristics of the cohort (Q1-Q2); (2) awareness about retention procedures (Q3-Q7); (3) retention protocol experienced and compliance (Q8-Q27). Descriptive statistics was performed for each item.

Results: survey participants were 302, and 74.2% received retention instructions and devices after the orthodontic treatment. Notably, 31.9% received fixed retainer and 68.1% mobile devices, with the instructions to wear them every night (61.6%) or also during the day (33.5%). Currently 50.4% of participants no longer use retention devices and 89.3% stopped its use in the first 10 years after the end of treatment, despite the indication of dentist. In fact, time of retention was not specified by dentists for 33.7% of participants, while 10 years/for life were suggested for 38.6%.

Moreover, 65.3% of participants reported teeth movement after the end of treatment.

Conclusions: the results of the current survey pointed out a satisfactory level of knowledges about the need for retention procedures among orthodontic patients, but a better compliance is needed to obtain a long-term stability of results.

EVALUATION OF TRANSVERSE DIAMETERS ON VIRTUAL MODELS OF CLASS I, II AND III SUBJECTS

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Aim: the practice of performing maxillary expansion in the treatment of class II is widely used in clinical practice, even in cases where there is no cross-bite. The aim of the study is to compare the upper and lower inter-canine (IC) and inter-molar (IM) diameters between Angle class II subjects and Angle class I and III subjects to determine whether there is a correlation between class II and reduced arch diameters.

Methods: a total of 376 virtual models of untreated subjects were selected. Measurements were taken through the software Meshmixer (Autodesk inc.), using the cusps of the canines and the central fossa of the first molars as reference points. According to the Angle class, the sample was divided into 3 groups. ANOVA was used to test the differences among groups' means of IC and IM diameters. The p value was set to <0.05.

Results: the means of the maxillary IC and IM diameters were 32.9±2.63 mm and 45.2±2.77 mm in class I group, 31.9±2.55 mm and 44.4±3.23 mm in class II group and 34.0±1.72 mm and 46.3±4.22 mm in class III group. The means of the mandibular IC and IM diameters were 24.9±2.54 mm and 40.8±3.21 mm in class I group, 24.7±2.64 mm and 41.0±3.33 mm in class II group and 25.5±3.25 mm and 42.5±4.65 mm in class III group.

Conclusions: there was a statistically significant difference in both maxillary diameters between class I and class II groups (IC p = 0.002, IM p = 0.033) and between class III and class II groups (IC p = 0.006, IM p = 0.042). No statistically significant differences between the group were found in the mandibular diameters.

PREDICTABILITY OF UPPER ARCH EXPANSION WITH SPARK ALIGNERS USING THREE PROTOCOLS

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Aim: on the last decades the use of aligners to level and align dental arches has increased exponentially. Aligners are clear and removable appliances that can be used together with attachments bonded to teeth, to help achieving the most complex movements. This study aims to evaluate the predictability of maxillary dental-alveolar expansion with Spark aligners using three different protocols: blocked, contracted or expanded second molars.

Methods: 40 patients have been included in this study, excluding patients with incomplete data, like missing teeth. To make linear measurements the software used was Viewbox 4. The measurement made were on 2nd molars, first molar, 2nd premolars, first premolars, canines. The patients were divided into three groups, based on the results obtained: contractions of the 2nd molar (group A), 2nd molar still (group B), expansion of the 2nd molar (group C).

Results: the result obtained by analysing the measurements is that the predictability of dental-alveolar expansions of first molar, premolars and canine with contraction of the second molar (group A) is higher than the one of groups B and C. Moreover, group B protocol, maintaining unmovable the 2nd molar, has a better predictability than group C.

Conclusions: nowadays aligners are used also for moderate to complex treatments. In treatments where maxillary expansion is needed, through this study, it has been observed that there is a higher predictability of expansions by contracting the 2nd molars than maintaining them still or expanding them.

DOES MANDIBULAR TYPOLOGY AFFECT COMPLEXITY IN THIRD MOLAR EXTRACTIONS?

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Aim: to evaluate any differences regarding the difficulty of impacted third molar extraction among mandibular typologies.
Methods: a total of 40 consecutive patients requiring third molar extraction were radiographically analyzed. The mandibular typology for each patient was established through cephalometric analysis based on the evaluation of SN^GoGn, CoGoMe^ and ANS-PNS^GoGn. The difficulty level was assessed on computer tomographies, applying a difficulty scale based on seven parameters: angulation, available space, depth, relationship with mandibular canal, buccolingual position, bone density and tooth morphology. The correlation was assessed through multinomial regression.
Results: a total of 65 third molars in 40 patients (17 females and 23 males, average age 26.15 years old) were evaluated. The sample was divided into three groups, based on facial typology: brachyfacial (25), mesofacial (30) and dolichofacial (10). Although linear regression did not show any association ($p = 0.728$) between mandibular typology and the total coefficient of difficulty, nominal regression showed a statistically significant association between bone density and mandibular typology ($p = 0.043$).
Conclusions: mandibular typology does not affect complexity in impacted third molars extractions. However, dolichofacial typology has shown less bone density than meso and brachyfacial typologies.

LEVEL OF ORTHODONTICS KNOWLEDGE AMONG GRADUATING DENTAL STUDENTS

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Aim: nowadays the attention about orthodontics and the masticatory function is growing in dental schools and basic knowledge of these topics are essential in order to correctly practice the other branches of dentistry. The objective of this questionnaire is to evaluate the average knowledge of orthodontics among students going to get graduated.
Methods: an anonymized survey, available in Italian, was sent electronically to 100 dental students of different Italian universities. The questionnaire was composed of ten questions made specifically for this study, using Google form (Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA, USA). All participants provided informed consent and accepted the privacy policy for the protection of personal data. It was achieved a number of answers equal to 74%.
Results: 97.3% affirmed to know what the Spee curve is. 50% of the sample declared being able to distinguish the physiological values of overjet. 23% had not understand the correct use of Delaire's mask. When it was asked the differences between the habitual occlusion and the centric relation, the 94.6% gave the correct answers. 95.9% was conscious of the correct use of Invisalign aligners. The knowledge of dental torque was not widespread, in fact 25.7% gave a wrong answer. Eventually 81.1% was aware of the Andrews occlusions keys.
Conclusions: according to these results the middle awareness of the Italian dental students about orthodontics and masticatory functions is not ideal, even if it is evident a general increasing of interesting towards this topic.

MORPHOLOGICAL AND DIMENSIONAL CHANGES OF THERMOPLASTIC RETAINERS AFTER INTRA-ORAL AGEING

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Aim: this study aimed to analyze dimensional changes of thermoplastic removable retainers after three months of intra-oral aging.

Methods: twenty adult patients (9 males and 11 females; age: 21-25 years) were recruited after fixed orthodontic treatment. After intraoral digital impression, upper and lower thermoplastic retainers were realized. With an industrial scanner, the removable retainers were digitized at the start of the retention phase (T0) and after 3 months (T1). The T0 and T1 digitized retainers were superimposed using a point-based and surface-based algorithm. After superimposition, cross-sections of digitized retainers were realized with a 2D slicing tool at the level of central fossa of second molars and inter-incisive papilla. Then, point-to-point linear deviation between the surfaces at T0 and T1 was measured.

Results: the analysis showed a linear deviation between 0.05 and 0.3 mm of an average 42.6% points of upper retainers and 46.4% of lower retainers. The lower right second molar and upper inter-incisive papilla showed the highest percentage of average point-to-point deviation (respectively 56.9% and 46.7%).

Conclusions: both upper and lower thermoplastic retainers showed dimensional and morphological changes after three months of intra-oral ageing.

A COMPLEX MANAGEMENT OF SEVERAL INCLUDED DENTAL ELEMENTS. A CASE REPORT

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Aim: eruption anomalies are frequently encountered in clinical practice and timely interception can be crucial for effective case management, especially in cases of tooth impaction.

The following clinical case presents a complex orthodontic management of a multidisciplinary case with several impacted teeth.

Methods: in 2020, a 10-year-old healthy patient came to our observation.

The intraoral examination showed multiple carious lesions and absence of teeth 11, 12 and 23 in the arch. The patient had a Class III skeletal growth.

Radiographically, it was observed: teeth 23 and 24 involved in a cystic lesion, the agenesis of tooth 12 and impacted teeth 11 and 13, with a supernumerary tooth.

Results: first of all, the treatment of marsupialization of the cystic lesion was performed, then the case was managed with an initial cycle of rapid palatal expander.

The recovery of tooth 11 was managed with an operculization of the vestibular mucosa and the multibracket therapy. Subsequently, orthodontic-surgery treatment of tooth 24 was performed, followed by extraction of ethe supernumerary tooth 13.

Conclusions: tooth impaction can be very complex to manage, requiring a multidisciplinary approach.

It is important that both pediatric dentists and general pediatricians are able to intercept eruption anomalies as soon as possible so that orthodontists can collaborate with surgeons to develop a correct orthodontic-surgical treatment plan.

ORTHODONTIC EXTRUSION, BIOMECHANICAL AND APPLICATIONS IN AESTHETIC ZONES

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Aim: orthodontic therapy is an essential part of dental treatment, especially in the prosthetic field. Orthodontic extrusion, known as forced eruption, was initially described as a treatment option to change the position of teeth in their socket through an occlusally active vertical eruption. The purpose of this study is to describe the treatment of a 57-year-old patient, who needed an improvement in aesthetics and a makeover of the prosthetic device.

Methods: the patient was seen in the Orthodontics department of the "San Giovanni di Dio" Hospital in Cagliari.

The clinical inspection revealed the presence of incongruous prosthetic products, a class II division II malocclusion and reverse gingival architecture. Orthodontic therapy was selected, in particular the orthodontic extrusion of 12 and 22 through the application of light forces in order to obtain an increase in the attached gum and with coronalization of the parabola's gums. Cylindrical section slots are created on the palatal surface of the upper teeth with light-curing composite, inside which a 0.16 mm lingual orthodontic NiTi arch is slid.

Results: the patient was brought to the attention of the clinicians every three weeks to check the orthodontic movement and to eliminate the pre-contacts.

After 9 weeks the planned extrusion was obtained and the prosthetic operations began.

Conclusions: mastery of orthodontic extrusion techniques represents an important option in interdisciplinary treatment plans because it offers predictable results through a minimally invasive or sometimes totally non-invasive procedure.

MULTIDISCIPLINARY APPROACH TO DISINCLUSION OF IMPACTED MAXILLARY CANINE

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Aim: the present study aims to demonstrate the efficacy of canine disinclusion and placement in the arch through the orthodontic-surgical approach.

Methods: the upper canine is the tooth most likely to be included after the third molar, ranging from 0.2-2.8%. The prevalence of palatal impaction of 85% is higher than vestibular impaction of 15%. The persistence of the deciduous canine and the delayed eruption of the permanent tooth are clinical signs. Clinical examination should be confirmed by OPT and CBCT radiographic examination. Localization is diriment by the choice of surgical approach (palatal or vestibular). Management is always multidisciplinary orthodontic-surgical.

A 20-year-old female patient presented to our observation, presenting first canine and molar class, with the permanence of dental elements 5.3 and 6.3. After CBCT analysis, it was possible to assess the actual position of included elements 1.3 and 2.3. It was decided to disinclude both canines first by surgical approach with avulsion of deciduous 5.3 and 6.3, surgical exposure of the two permanents 1.3 and 2.3, and application of orthodontic buttons with orthodontic traction anchored trans-palatal bar.

Multibrackets therapy (ROTH) uses self-ligating brackets and elastic springs in areas to preserve the post-extraction space of the deciduous.

Conclusions: it is correct to try to reposition the included canines in the arch; they are irreplaceable elements within the oral cavity both functionally and aesthetically in the projection of the smile line.

REVERSE CHEWING CYCLES AND SPINAL FLEXION IN PATIENTS WITH UNILATERAL POSTER CROSSBITE

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Aim: to investigate the association between reverse chewing cycles (RCC) and spinal flexion in the frontal plane in unilateral posterior crossbite (UPC) patients.

Methods: this study included 87 patients with UPC (median (IQR) age 8.0 (7.3-9.3)[yr.mo]; M = 44, F = 43) and a control group of 53 patients with normal occlusion (median (IQR) age 10.7 (9.3-12.8) [yr.mo]; M = 28, F = 25). Masticatory patterns were recorded during soft and hard bolus chewing with a kinesiograph (K7-I; Myotronics, Tukwila, WA, USA). Spine alignment was assessed with an electronic inclinometer Spinal Mouse® system (Idiag AG, Switzerland).

Results: the UPC patients showed a higher percentage of RCC on the crossbite side than the control group ($p < 0.001$). Moreover, a clear difference was observed between the spine's left and right flexion angles in the patients' group ($p < 0.001$ and $p = 0.001$), with the crossbite side being more flexible than the non-crossbite side. No such differences were seen in the control group.

Conclusions: this study suggests an association between UPC, asymmetrical chewing patterns, and asymmetrical spine flexion. These results may help improve understanding of any association between dental malocclusions and spine posture, aiding diagnosis and treatment strategies.

PREVALENCE OF REVERSE CHEWING PATTERNS IN ADOLESCENT IDIOPATHIC SCOLIOSIS

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Aim: to evaluate the masticatory function in a group of patients with Adolescent Idiopathic Scoliosis (AIS) with a control group using reverse chewing cycles (RCC) prevalence.

Methods: this study included a group of patients (N = 32; F = 24; M = 8; mean age±SD = 14±3 years) with a confirmed diagnosis of Adolescent Idiopathic Scoliosis and without posterior crossbite and a group of control subjects (N = 32; F = 24; M = 8; mean age±SD = 13±6 years) without spinal disorders and with normal occlusion.

Masticatory patterns were recorded with a kinesiograph (K7-I; Myotronics, Tukwila, WA, USA) during soft and hard bolus chewing, following a standardized protocol, and the prevalence of reverse chewing cycles were compared between the groups.

Results: patients with AIS showed a significantly higher percentage of reverse cycles when chewing on both sides, both with the soft and hard bolus, when compared to the control group (Right side soft bolus: 17.96% for patients AIS and 3.97% for control patients, $p < 0.001$; right side hard bolus: 19.12% for patients with AIS and 2.31% for control patients, $p < 0.001$; left side soft bolus: 20.9% for patients with AIS and 4% for control patients, $p < 0.001$; left side hard bolus: 14.87% for patients with AIS and 3.9% for control patients, $p < 0.001$).

Conclusions: this study's results indicate that Adolescent Idiopathic Scoliosis influences mastication, i.e., one of the main functions of the stomatognathic system. A multidisciplinary approach to these patients may be relevant in providing the best possible treatment outcomes.

BRACKET SURVIVAL AFTER ERYTHRITOL AND SODIUM BICARBONATE PRETREATMENT

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Aim: to test the efficacy of two different enamel pretreating agents on survival rates of orthodontic brackets.

Methods: 20 patients about to start fixed orthodontic treatment were enrolled and divided into 2 groups (A and B) according to a split-mouth design. Before the bonding of vestibular stainless-steel brackets, all the teeth were pretreated with erythritol and bicarbonate (with different particle size, respectively 14 and 65 mm) through Air-Flow handpiece for 5 seconds at maximum pressure, at a distance of 5 mm and an inclination of 90° between the enamel surface and the toecap. In group A, erythritol was used in the maxillary left and mandibular right quadrants, whereas sodium bicarbonate in the mandibular left and maxillary right quadrants. In group B, the quadrants were inverted. Bond failures were recorded every month for the first year of treatment whereas the periodontal evaluations including Probing Pocket Depth (PPD), Bleeding on Probing (BoP), Plaque Index (PI), and Papilla Bleeding Index (BPI) were collected before the beginning of treatment and 1, 3, 6 and 12 months after the bonding.

Results: a statistically significant difference in the failure rates between erythritol (3.00%) and sodium bicarbonate (7.50%) was found (P <0.05).

Kaplan-Meier survival plots showed statistically significant differences in terms of risk of failure between the 2 study groups. As regards the indexes, no significant difference was found between the two agents.

Conclusions: the use of erythritol as a pretreatment agent could reduce the failure rate of orthodontic brackets.

CEPHALOMETRIC CHANGES AFTER DISTALIZATION WITH PENDULUM IN SKELETAL CLASS I AND III

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Aim: maxillary molar distalization allows to increase space in the upper arch and to obtain a first class molar ratio. During distalization there is also a loss of anterior anchorage, with mesialization and buccal tip of the first premolar and upper incisors.

Distalization is indicated also in skeletal class III patients: in this case there is often a lack of space in the upper arch, and the loss of anterior anchorage can be used as a therapeutic effect. The aim of this study is to evaluate the distalization in skeletal class III patients.

Methods: laterolateral teleradiographs of 13 patients in skeletal class III, and 42 patients in skeletal class I, aged between 12 and 14 years, were analyzed before and after treatment with a K-Pendulum device.

Results: the results show that there are no statistically significant differences between the two samples. In skeletal class I patients the distalization of the molar was 3 mm, and the mesialization of the incisors 1 mm: 74% of the sagittal movement was therefore due to the movement of the molar, and only 26% due to the movements of the incisors. In the III class group the molar distalization was 2.4 mm, and the mesialization of the incisors was 1.7 mm: the molar movement was 59% of the total, and that of the incisors was 41%.

Conclusions: maxillary molar distalization in skeletal class III patients has no adverse effects, as seen from the comparison with class I. In class III patients there was a greater percentage loss of anchorage: this can therefore be used as a real therapeutic effect to improve the anterior relationships.

ALIGNERS *VS* DEVICES WITH OCCLUSAL BITERAMPS: EFFECTS ON EMG ACTIVITY IN YOUNG PATIENTS

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Aim: to compare the neuromuscular effects of clear aligners (CA) and fixed appliances with occlusal biteramps (FA) on the stomatognathic system after 3 months of treatment, through surface electromyographic (EMGs) analysis.

Methods: a total of 28 patients, between 13 and 22 yo, have been selected: 19 treated with CA and 9 with FA.

EMGs has been performed at the beginning (T0) and after 3 months (T1) of orthodontic treatment; measurements were collected with the Teethan software (Garbagnate Milanese, MI, Italy), evaluating indexes of the occlusal condition for both the time points: Percent Overlapping Coefficient (POC), Barycenter (BAR), Torsion (TORS), Impact (IMP).

Statistical analysis was performed using the R statistical package (version 3.0.1, RCoreTeam, Foundation for Statistical Computing, Vienna, Austria). The normality assumption of the data was evaluated with the Shapiro-Wilk test. Differences between T0 and T1 were compared with the t test. The level of significance was set at $P < .05$.

Results: in FA group, although a slight increase in POC, a decrease of BAR, TORS and IMP indexes were shown; none of these changes were statistically significant. In CA group, POC and TORS indexes increased to the normality range, but not statistically significant; BAR and IMP indexes, instead, had a significant increase ($p = 0,029$ and $p = 0,038$ respectively).

Conclusions: despite the FA group, significant improvements in neuromuscular balance (BAR) and muscle strength intensity (IMP) were found in young patients treated with CA. Given the limited sample size, these results should be taken with caution.

A NEW QUALITY LIFE (OSA WELNESS SCALE) IN DENTISTRY OSA PATIENTS

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Aim: the aim of this observational retrospective study is to present a new short self-test called the OSA Wellness scale (OWS), used to evaluate the health-related life quality (HRQoL) changing in OSA patients treated with MAD.

Methods: 36 OSA patients (5 women and 31 men, mean age 51.7) treated with a fully customizable MAD device (Protrusor) were retrospectively enrolled. Each patient received a home sleep apnea testing (HSAT) at baseline(T0) and after three month of MAD treatment(T1). Two self-test evaluations, the Epworth sleepiness scale (ESS) and OWS were also submitted at T0 and T1. The OWS was a short 8 questions self-test for evaluating the daytime HRQoL. Patients gave an assessment from 0 to 3 for each question. At the end, the questionnaire gave the patient's score from 0 to 24, resulting by the sum of all 8 scores. Hight score test detected the patient's discomfort state.

Results: this Retrospective study showed a significant decrease in the oxygen desaturation index (ODI) and apnea-hypopnea index (AHI) ($P < 0.0001$); no significant changes in body mass index (BMI); a significant reduction of both the ESS and OWS records, in daytime sleepness and HRQoL. ($P < 0.0001$).

Conclusions: the OWS could be a useful method to verify and numerically compare the perceived life quality in OSA patients, before and after MAD therapy.

HOW AGING AFFECTS LIP DIMENSIONS: A 3D ASSESSMENT ON HEALTHY SUBJECTS

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Aim: to evaluate the effect of aging on labial morphology.

Methods: a sample of 37 white Caucasian adults (young: 10 women, 11 men, age range 21 to 34 years, mean age 26; old: 9 women, 7 men, age range 48 to 61 years, mean age 53) was analyzed. Study participants were chosen according to the following inclusion criteria: complete maxillary and mandibular dental arches, Angle class I, OVJ <5 mm; exclusion criteria were: history of craniofacial surgery and/or trauma, congenital anomalies, periodontal disease and caries. Impressions of extra-oral (cutaneous) and intra-oral (mucosal) surfaces of the lips were taken and cast in dental stone. Each cast was then digitized and reconstructed using NURBS (Non Uniform Rational B-Spline) curves. Data concerning vermillion surface area, lip volume and lip thickness was gathered, and comparisons were made through ANOVA tests.

Results: all measurements resulted to be greater in men than in women. Labial dimensions resulted to be inversely related to age.

Differences between genders and age groups were statistically significant (vermillion area: sex, age $p < 0.001$; upper lip volume: age $p = 0.012$; lower lip volume: sex, age $p < 0.005$; lip thickness: sex, age $p < 0.05$).

Conclusions: modifications of facial soft tissues may be noticeable even in healthy individuals with full dentition as they age. In fact, after the 5th decade of life, labial dimensions decrease significantly in the three planes of the space, and said reduction is especially evident in the lower lip. Further research may allow a better understanding of facial modifications due to aging.

SURVEY OF KNOWLEDGE ABOUT PEDIATRIC SLEEP MEDICINE AMONG ITALIAN DENTISTS

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Aim: this study aimed to investigate knowledge and attitude about obstructive sleep apnoea (OSA) in children among Italian dentists.

Methods: an anonymous questionnaire was prepared using Google Forms and sent to dentists in Italy via private social platforms. The first part of the questionnaire contained basic demographic data questions, and the second part included items about paediatric OSA. A total of 125 responses were recorded over one month. For this study, we excluded questionnaires compiled by orthodontists using the answer "no" to the question "have you achieved your orthodontic residency?".

Results: the general dentists who compiled the questionnaire were in total 85, 35 female e 50 male, with an average age of 46,8 years, from regions of North, Centre and South Italy. About 50% of them reports having never received training about paediatric OSA and about 60% consider their knowledge in that field low. Most of the dentists who participated in this study acknowledge the importance of the multidisciplinary team in the management of OSA in children; despite that, they can't correctly identify the figures mandatorily involved and the referral to other specialists is infrequent. Moreover, some of the most common risk factors of the disorder remain underestimated and some severe consequence of OSA are not recognized by at least 30% of the interviewed.

Conclusions: this study shows lack of knowledge about paediatric OSA and its management among Italian dentists, revealing the need to update the dentistry curriculum and to organize educational interventions.

PREDICTABILITY OF TEETH ROTATION IN PATIENTS TREATED WITH CLEAR ALINGERS

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Aim: clear aligners are daily employed for the treatment of several malocclusions. Previous clinical studies indicated low accuracy for the correction of tooth rotations. The aim of this study was to evaluate the predictability of tooth rotations with clear aligners.

Methods: the sample comprised 390 teeth (190 mandibular; 200 maxillary), measured from the virtual models of 45 participants (21 men, 24 women; mean age: 29.2 years old). For each patient, digital dental models (STL files) of pre-treatment (T0), virtual plan (T1) and post-treatment (T2) of both, mandibular and maxillary arch were superimposed with Geomagic Control X. Two landmarks for each tooth were collected to define a vector in T0, T1 and T2, then, with an angular measurement tool, both the angle prescribed in the virtual treatment plane (angle formed by vectors in T0 and T1) and the corresponding angle obtained in the post-treatment (angle formed by vectors in T0 and T2) were calculated and compared to assess their accuracy.

Wilcoxon signed-rank test and paired t-Test were used to assess differences between prescribed and achieved movements ($P < 0.05$).

Results: the overall predictability of rotation movement was 78.58% for mandibular arch and 75.03% for maxillary arch. Second molar accuracy was the lowest in both cases while for the same group of teeth there were noticeable differences between the upper and lower arches.

Conclusions: clear aligners were not always able to achieve 100% of the planned movement.

IN VITRO STUDY TO EVALUATE SHEAR BOND STRENGTH BETWEEN ENAMEL PRETREATED AND BRACKETS

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Aim: to evaluate the bonding failure rates of orthodontic brackets after enamel pretreatment with decontaminating powders showing different particle sizes and RDA values, before the conventional acid etching procedure.

Methods: 80 bovine teeth were randomly and equally divided into 4 groups according to the pretreating agent used and its granulometry: erythritol (14 mm), glycine (18-22 mm) and sodium bicarbonate (65-70 mm). A control group with no pretreatment was considered. A sample of teeth underwent SEM morphologic evaluation of pretreated enamel. Teeth were etched and brackets bonded, then shear bond strength (SBS) was calculated with a universal testing machine.

Results: the SBS values were higher when using erythritol and no significant differences were reported with the untreated control group ($P > 0.05$), but with significant differences with glycine and sodium bicarbonate ($P < 0.05$). No difference was found between erythritol and glycine ($P > 0.05$). The lowest SBS values were found for sodium bicarbonate ($P < 0.05$). Pearson's correlation coefficient showed a moderate negative correlation between SBS values and the particle size of the pretreating agents ($r = -0.6217$). The findings of SEM microphotographs indicate that enamel is subjected to morphologic changes after pretreatment with erythritol, glycine, and sodium bicarbonate, with an increased roughness for higher particle size pretreating agents.

Conclusions: pretreated enamel with erythritol could represent a valid approach to reduce failure rates of orthodontic brackets.

ASSESSMENT OF SPONTANEOUS UPPER FIRST MOLAR DEROTATION AFTER LEAF EXPANDER AND RME

Abate A.

Aim: to assess the spontaneous upper first molar derotation after Leaf Expander (LE) and RME anchored to the deciduous molar.

Methods: inclusion criteria: no systemic disease; maxillary hypoplasia; CVMS 1-2; fully erupted upper first permanent molars. Exclusion criteria: CVMS 3-6; second deciduous molar not available; Class III malocclusion. 114 patients recruited at the Universities of Milan, and Genova were randomly located into LE and RME group. Allocation was performed by using a stratified blocked randomization. Patients were subdivided based on the presence or not of posterior crossbite. The paired T test was used for intra-group comparison. ANOVA test was computed for subgroups comparison. Linear regression analysis was also performed.

Results: a significant derotation was found after LE and RME in no-cross, monolateral and bilateral crossbite groups. LE showed a significant greater derotation in monolateral crossbite subgroup compared to RME.

LE appliance demonstrated a significant greater amount of molar derotation. The linear regression model showed a significant correlation between the amount of expansion and molar rotation.

Conclusions: maxillary expansion performed on deciduous molar produces spontaneous molar derotation. LE showed a significant greater molar derotation with also a greater effect on the crossbite side of the monolateral crossbite subgroup. Molar derotation is correlated to the amount of the expansion obtained on the second deciduous molar.

SKELETAL AND DENTAL EFFECTS OF FGB APPLIANCE COMPARED TO RPE AND UNTREATED CONTROLS

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Aim: the maxillary expansion is a fundamental interceptive orthodontic treatment because several morphological and functional aspects can be affected by a maxillary transversal deficiency. The maxillary expansion can be provided through either rapid expansion protocol or functional devices. The latter are preferred because of a lower risk of complications, but no data exist about their efficacy in providing a skeletal expansion. Therefore, the aim of this study was to compare the effects of the rapid palatal expander (RPE) and the function-generating bite (FGB) on the transversal dimension of the maxilla and dental arch width.

Methods: one hundred eighty-one young skeletal Class I patients with maxillary transversal deficiency were retrospectively enrolled in the study; among these 55 were treated with FGB, 73 were treated with RPE and 51 were untreated subjects retrieved by historical databases. The pre-treatment (T0) and post-treatment (T1) frontal cephalograms were retrieved, the width of maxillary and mandible was measured and the distance between upper first molars and lower first molars were collected. Then, a statistical analysis was performed.

Results: the statistical analysis showed that there are not statically significant differences regard the skeletal expansion and dental expansion between the RPE and FGB groups, while the untreated control group showed statistically significant differences compared to other two groups.

Conclusions: the effects of RPE and FGB appliances on skeletal and dental arch width were comparable between groups.

CRANIOFACIAL MORPHOLOGY RELATED TO TMD: A RETROSPECTIVE STUDY

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Aim: the aetiology of temporomandibular disorders is multifactorial and include trauma, parafunctional habits, psychological and social aspects. A recent review found an association between second skeletal classes, hyperdivergent jaw and the frequency of TMJ disc dislocations. The present retrospective study aims to evaluate the association between condylar height symmetry, vertical skeletal patterns and TMD in adults.

Methods: 200 patients between 18 and 30 years were recruited and divided into two groups: the experimental group included 100 patients with TMD (diagnosed by diagnostic criteria for temporomandibular disorders DC/TMD) and the control group consisted of 100 patients without TMD. For each subject, skeletal divergence was evaluated on cephalometry (SnaSnp^GoGn angle) and condyle height symmetry was assessed on orthopantomography according to Habet's method. Data were submitted to statistical analysis and significance was predetermined at $p < 0.05$.

Results: a strong association between TMD, hyperdivergence ($p = 0.0015$) and condylar asymmetry ($p < 0.0001$) was found. These disorders were observed more frequently in the female sex ($p < 0.04$) which can be related to the hormonal influence predisposing to cartilage breakdown.

Conclusions: hyperdivergent skeletal pattern and condylar asymmetry are important risk factors for TMD in adult patients whose prevalence is higher in women. Orthopantomography and cephalometry are useful preliminary screening methods to intercept patients with functional TMJ disorders.

PREVALENCE OF OXYGEN DESATURATION IN YOUNG ADULTS WITH TOOTH WEAR

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Aim: to investigate the prevalence of oxygen desaturation events during sleep in a population of young adults with tooth wear (TW).

Methods: this retrospective cohort study included subjects between 18 and 45 years with TW who had undergone a sleep study for suspected obstructive sleep apnea. TW was assessed using the Tooth Wear Evaluation System 2.0 and classified as mild, moderate or severe. Age, sex, body mass index (BMI), oxygen desaturation index (ODI, defined as the number of times oxygen saturation dropped to ≥3% per hour of recording) were also collected from medical records. ODI was graded into 4 groups: no desaturations (<5 events/hour), mild (5-15 events/hour), moderate (15-30 events/hour) and severe desaturations (≥30 events/hour).

Results: 26 patients were included. Overall, the prevalence of mild desaturations was 46%, followed by moderate (8%) and severe (4%) ones.

Respectively 43%, 73% and 25% of the patients with mild, moderate and severe TW exhibited mild to severe desaturations. No statistically significant difference existed across different desaturation subgroups for anthropometric data as well as for the severity of TW.

Conclusions: these preliminary data do not support the hypothesis of a correlation between severity of TW and desaturation events.

Further controlled studies on larger sample size are required in order to improve the generalization of the results.

IMPORTANCE OF POSITIONAL OSAS IN AN OSAS PATIENT POPULATION: A RETROSPECTIVE STUDY

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Obstructive sleep apnea syndrome (OSAS) is a sleep disorder characterized by repetitive airway obstructions during sleep, leading to oxygen deprivation and non-restorative sleep. OSAS has been linked to a range of health consequences including hypertension, neuropsychiatric abnormalities, and cardiovascular disorders. Mandibular advancement devices (MADs) have been recognized as a non-C-PAP therapy with proven efficacy in OSAS patients, increasing airway volume to prevent airway collapse. MADs have been shown to improve quality of life and work performance, and are indicated for patients with mild to moderate OSAS or who cannot tolerate C-PAP. However, individual responses to MAD therapy vary, and multidisciplinary approaches and clinical follow-up are crucial for successful treatment. PSG remains the best tool for monitoring OSAS progression.

Positional OSAS (where airway obstruction occurs primarily in the supine position) may also play an important role in predicting the success of MAD therapy. Patients with positional OSAS have been shown to have a better response to MAD therapy, as the device can help to maintain the airway patency in the supine position. Therefore, identifying the positional component of OSAS may be a crucial consideration in predicting the therapeutic outcome of MADs, and in optimizing treatment strategies for individual patients.

EFFECTS OF RAPID AND SLOW MAXILLARY EXPANSION IN PRE-PUBERTAL PERIOD: A SCOPING REVIEW

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Aim: the maxillary transverse skeletal deficiency is a common clinical finding, frequently managed with orthopedic expansion of the maxilla. The objective of this scoping review can be resumed in the following PICO question: (P) in pre-pubertal children in mixed or early permanent dentition (I) the orthopedic expansion of the maxilla (C) performed with rapid (RME) or slow (SME) expansion (O) exhibit statistically significant differences?

Methods: the PubMed, Scopus, The Cochrane Library and EMBASE online databases were searched according to the PRISMA-ScR guideline until October 30, 2022. Inclusion and exclusion criteria were established based on the PICO question: studies involving patients with cranio-facial anomalies and procedures involving mini screws and surgery were excluded. Two authors (S.T. and E.L.) conducted the study selection and data extraction; author's reliability was calculated with Cohen's Kappa statistic, meanwhile the Newcastle-Ottawa (NOS) scale was used to assess the studies' quality.

Results: after full text assessment, only 13 were included in the qualitative synthesis. NOS scores ranged 6 to 9 indicating high quality. The effects of RME (351 patients) and SME (169 patients) were compared and no statistically significant difference was registered, in terms of skeletal and dental changes.

Conclusions: overall, both RME and SME protocols were effective in treating maxillary transverse skeletal deficiency in pre-pubertal patients. Therefore, the choice between the two activation modalities is once again dependent on the clinician's experience and preference.

EVALUATION OF THE VARIABLES THAT INFLUENCE THE ACCURACY IN THE ATTACHMENTS REPRODUCTION

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Aim: the purpose of this study was to evaluate some clinical variables that influence the accuracy of thermoplastic template in reproducing the planned attachment shape. The following variables were considered: template material, type of composite, and pressure application on template during attachment curing.

Methods: the chosen materials used in this study are two types of composite resins: Enaflow (Micerium), Enamel plus dentina HRI (Micerium). Two different materials for the construction of the thermoplastic transfer template: Erkolen 0,8 Erkodent (PE) and Erkodur 0,8 Erkodent (PET-G). Two different light curing lamps: Valo cordless color no pressure and push light pressure (SCS). The 26 models included in the study were imported in the Ortho Analyzer software (3shape, Denmark), and attachments were virtually placed on dental elements of the first premolar and on both sides of the first upper molars. The accuracy of attachment reproduction was evaluated through linear and angular evaluations against the reference model (MCAD). Three physical models were obtained: model A (MA) printed with attachments, model B (MB) with attachments made with PE template and model C (MC) with attachments made with PET-G template.

Results: the results showed statistically significant differences ($P < 0.05$) between the PE and PET-G template with greater precision using PET-G template. Statistically, significant differences ($P < 0.05$) were found among Pasta composite and Flow composite with pressure curing.

Conclusions: in light of the data obtained, it is advisable to use a PET -G template and to not use pressure to cure when the attachment is built in flow.

FOOD CONSISTENCY AND MALOCCLUSION: SUGGESTION OF A QUESTIONNAIRE ON NUTRITION HABITS

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Aim: malocclusion is a condition existing since ancient times nevertheless it has been highlighted that the frequency has increased over the years. Dietary factors play a role in *malocclusion occurrence*. The aim of the study was to develop a questionnaire, which does not currently exist, to investigate the dietary habits regarding food consistency and frequency among pediatric patients.

Methods: following the consistency categories developed from the Nutritional Academy for dysphagia patients, foodstuffs were divided into 5 categories and scored from 0 to 4 as follows: liquid (0), semiliquid (1), creamy (2), soft (3) and solid/hard (4).

Results: a food questionnaire, divided according to the main meals, was developed: this questionnaire has a column on the left where the aliments belonging to a specific consistency category are listed, and a column on the right where it is requested to indicate the frequency of intake.

Conclusions: the questionnaire can be a useful tool to describe eating behaviors and preference of food in order to investigate the impact of diet consistency on orofacial development.

EFFECTS ON FACIAL SOFT TISSUES PRODUCED BY RAPID *VS* SLOW MAXILLARY EXPANSION: A RCT

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Aim: to compare the effects on facial soft tissues produced by rapid (RME) *vs* slow (SME) maxillary expansion in growing patients.

Methods: in the RME group (8.2±1.3 ys) a conventional expander was applied while in the SME group (7.9±0.8 ys) the Leaf Expander was used. The primary outcome was the difference of facial tissue changes in the nasal area measured on facial images captured through stereophotogrammetry before application of the expander and after one year of retention. Secondary outcomes were soft tissue changes of other facial regions (mouth, lips, and chin). Analysis of covariance was used for statistical analysis.

Results: 14 patients were allocated to both groups. There were no dropouts. Nasal width change showed a difference between the two groups (1.3 mm in favor of RME, 95%CI 0.4-2.2 mm, P = 0.005). Intercanthal width showed a significant difference (0.7 mm in favor of RME, 95%CI 0.0-1.3 mm, P = 0.044). Nasal columella width, mouth width, nasal tip angle, upper lip angle, and lower lip angle did not show any significant differences. The Y-axis (ant.-post.) components of the nasal landmark showed a significant difference (0.5 mm in favor of forward displacement of RME, 95%CI 0.0-1.2 mm, P = 0.040). Also, Z-axis (sup.-inf.) components of the lower lip landmark was significant (0.9 mm in favor of downward displacement of RME, 95%CI 0.1-1.7 mm, P = 0.027). All the other comparisons of the three-dimensional assessments were not significant.

Conclusions: RME produced significant facial soft tissue changes *vs* SME. RME induced greater increases in both nasal and intercanthal widths (1.3 mm and 0.7 mm). These findings, though statistically significant, are probably not clinically relevant.

INVESTIGATION OF SLEEP HABITS IN COMPETITIVE AND NON-COMPETITIVE ATHLETES

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Aim: sport leads to better mental and physical health, protecting the individual from cardiovascular disorders. The aim of this study is to establish if physical activity may also have a protective role towards obstructive sleep apnoea syndrome (OSAS). We analysed the routine of sportsmen related in particular to sleep and oral hygiene, in order to investigate the prevalence of OSAS and caries, respectively.

Methods: a questionnaire was administered to a mixed population, consisting of both sportsmen and ordinary people. It consists of three parts: the first one investigates the person's level of physical activity; the second part includes a screening for OSAS based on the Epworth Sleepiness Scale and the STOP-BANG questionnaire; the last part focuses on the consumption of sugary drinks during physical activity.

Results: 263 responses were collected: the sample includes 48 non-athletes and 214 athletes, of whom 149 are competitive. The study focuses on a sample of athletes practicing predominantly aerobic activities, since 66.3% of the competitive athletes practice triathlon, swimming or cycling. 29 persons, or 11% of the total sample, stated that they had experienced breathing apnoea during sleep. More than 80% report having had at least one caries on a permanent tooth.

Conclusions: the survey results are in line with the prevalence reported in the literature and indicate that OSAS is still a poorly understood condition, although it is estimated to be widespread. Carious pathology is also very common in the sports world due to the constant intake of sugary drinks during training.

SOFT TISSUES THREE DIMENSIONAL ANALYSIS FOR DIAGNOSIS OF SAGITTAL AND VERTICAL DISCREPANCY

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Aim: to establish variables based on 3D-imaging of the soft tissues which allow to perform a reliable analysis of the vertical and sagittal mandibular position.

Methods: data were collected at the University of Naples "Federico II", Italy. In this study, 300 participants who presented lateral cephalogram and three-dimensional facial scan were included. Facial scans were taken by means of 3dMD system. For vertical discrepancy, mandibular-plane angle (SN-MP) was considered and the partecipants were classified as hyperdivergent (SN-MP ≥42°), normodivergent (27°≤ SN-MP ≤37°), and hypodivergent (SN-MP ≤22°) facial types. For sagittal discrepancy, ANB angle was considered and the participants were classified as skeletal ClassI (0°≤ ANB ≤4°), ClassII (ANB ≥6°), ClassIII (ANB ≤-2). Nineteen ratio, angular and linear measurements were calculated. A stepwise multinomial logistic regression model was used to determine the best predictors of jaw vertical and sagittal position.

Results: in the vertical discrepancy analysis NTRGN and TRGOGN angles were the most predictive vertical variables to identify jaw divergence and they correctly identified almost the 94% of the hyperdivergent and hypodivergent patients. In the sagittal discrepancy analysis the ratio TRSN/TRPG was the most predictive variable to identify sagittal discrepancy and it correctly identified the 89% of the sagittal diagnosis.

Conclusions: three-dimensional cephalometric analysis of facials scans could represent a useful tool for classifying vertical and sagittal position of the mandible without unnecessary ionizing radiation.

FUNCTIONAL APPLIANCE IN CLASS II MALOCCLUSION: 3D CHANGES OF THE SOFT TISSUES

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Aim: the aim of the study was to evaluate the three-dimensional changes of soft tissues in growing patients with Class II malocclusion, after a treatment with a functional device.

Methods: 17 patients (14 males and 3 females, mean age: 11.7 years), recruited between April 2018 and June 2019 at the Section of Orthodontics at University of Naples Federico II, were included in the study. All the patients underwent a functional treatment with a Sander Bite Jumping Appliance (BJA). Facial scans were acquired using a 3dMD facial scanner before (T1) and after treatment (T2). T1-T2 mean interval was 1.2 years.

The data were analyzed by means of a Student T-Test for paired data and the level of significance was set as $P < 0.05$.

Results: the BJA produced an advancement of the lower jaw as indicated by the statistically significant changes in the Facial Convexity (T2 *vs* T1:2.1, SD:3.8, P = 0.033), LS-N-LI angle (T2 *vs* T1:-0.1, SD:2.3, P = 0.835), SS-N-SL angle (T2 *vs* T1:-1.3, SD:1.5, P = 0.003) and Upper Lip Position (-1.1, SD:1.7, P = 0.016). Moreover, there was a significant increase of the Submental angle (14.5, SD:13.8, P = 0.001).

Conclusions: the results of this study revealed that BJA was effective in determining soft tissue changes in young individuals. These changes were primarily located at mandible soft tissues with a mandibular and a lower lip advancement. There was also an improvement of whole profile subsequent to the increase of the facial convexity.

ORTHODONTIC EVALUATION IN CHILDREN WITH DOWN SYNDROME AND OBSTRUCTIVE SLEEP APNOEA

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Aim: the purpose of the study was to find an association between OSA and malocclusion features in children with Down syndrome.

Methods: a total of 48 children with DS were enrolled at the Department of Translational Medical Sciences, Federico II University, Naples, Italy. Inclusion criteria included children between 4-12 years old, with confirmed diagnosis of Down Syndrome (DS) by karyotype analysis. All subjects' mothers filled out the Child Sleep Habits Questionnaire in Italian language CSHQ-IT, and they were asked to score on a 3-point scale, children's sleep behaviors over a "typical" recent week. The score ranged from 33 to 99, and a cut-off of 41 identified sleep disorders. Children underwent orthodontic evaluation, performed by a specialist and the facial profile, molar relationship, Overbite and transversal molar discrepancy were analysed. Moreover, mothers were asked about sleep bruxism and oral parafunctional behaviors during the day. On the night of the study day, a sleep study with polygraphy (PG) was performed.

Results: the mean CSHQ-IT total score was 63±5.1. The orthodontic evaluation showed orthognathic profile in 68% of cases, class I relationship in 63%, and cross-bite in 51%. PG revealed OSA in 67% of cases (37% mild, 63% moderate-severe). No associations were found between the PG parameters and the orthodontic evaluation.

Conclusions: no significant associations were found between PG and the total CSHQ-IT score or orthodontic data.

GINGIVAL RECESSIONS FOLLOWING INVISIBLE ALIGNERS TREATMENT. RETROSPECTIVE EVALUATION

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A correlation between the use of fixed orthodontic appliances (FOA) and the onset of gingival recessions is now widely demonstrated. In 1999, a new type of treatment was introduced, designed, and created with invisible thermo-printed appliances.

It had great success, especially amongst adults, since it gives greater comfort, as the appliances are removed before meals and home oral hygiene practice; it also turns out to be less impactful from an aesthetic point of view, compared to FOA.

Aim: evaluate the number of gingival recession (REC) before the orthodontic treatment with aligners and compare it with the REC at the end of the treatment and after 5/10 years of a retention phase.

Methods: 49 patients were involved, for each of whom 3 intraoral photographs were taken at 3 different time points: before treatment (T0), at the end of orthodontic therapy (T1) and after following up from a minimum of 5 to a maximum of 10 years.

Teeth from 15 to 25 showing gingival recessions in the photos between T0, T1 and T2 were recorded.

Results: the data analysis showed that the gingival recessions recorded at time T2, almost doubled compared to those recorded at time T0, i.e., before treatment. In particular, the maximum possible increase in the incidence of recessions occurred between T0 and T1.

Conclusions: orthodontic therapy with aligners may increase the onset of gingival recessions during the treatment or in the retention phase. In future, it will be interesting to compare the occurrence of recessions, in the same time frame, between the treated and an untreated sample.

INVISALIGN® FIRST WITH MA TO SOLVE A SKELETAL CLASS II MALOCCLUSION: A CLINICAL CASE

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Aim: resolution of a clinical case of skeletal Class II malocclusion by using Invisalign® First with Mandibular Advancement (MA) device.

Methods: the treatment was performed on a 12-years-old male patient, brachyfacial, with hypodivergent pattern and convex profile, skeletal II class (SNA = 80°; SNB = 75°; ANB = 5°). Intraoral exam show a dental malocclusion II class I division, with increased ovj and increased ovb; presence of interincisal diastema; vestibular inclination of 2.1 and 2.2, extrusion of 5.3, palatoinclination and extrusion of 6.3, mesial derotation of 2.4, deviation of the upper midline to the lower midline; diastemature and slight crowding in both arches. The orthodontic treatment includes 3 jumps of mandibular advancement implemented through the Invisalign® aligners with vestibular Precision Wings features placed between the first molar and premolars, use of II elastic bands and attachments.

Results: through the Invisalign® First MA system, mesialization of the lower arch with wide correction of the dental class II and modest correction of the skeletal class (SNA = 80°; SNB = 79°; ANB = 1°) were obtained. Correction of overjet and overbite, closure of the central diastema and interarch spaces, flattening of the Spee curve, expansion, alignment and levelling of both arches, centered midlines, were achieved.

Conclusions: Invisalign® First with MA represents an efficient tool for the correction of dental-skeletal Class II malocclusion in a growing patient.

BAMP PROTOCOL: CLINICAL OUTCOMES OF CUSTOM-MADE MINIPLATES IN GROWING CLASS III PATIENTS

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Aim: bone Anchored Maxillary Protraction (BAMP) allows the correction of skeletal class III by maximizing anchorage control. The aim of this study is to compare surgery duration, anatomical risks, clinical complications and patient comfort of custom *vs* non-custom-made titanium miniplates in growing patients with skeletal class III.

Methods: patients were selected from the U.O.C. of Orthognatodontics, Sapienza University of Rome, following the inclusion criteria: age (9-14), SNA <80°, SNB >82°, overjet <1 mm. Overall, 4 patients were included: 2 were treated with custom-made miniplates, designed on *Creo PTC* software by matching the pre-surgery CBCT and digital dental scan stl files; 2 were treated with pre-shaped miniplates. In both groups, the pre-surgical CBCT allowed the evaluation of ideal bone thickness and miniplate positioning. Following the surgical placement of miniplates, patients underwent class III maxillary traction with elastics of growing intensity: 150 g, 200 g, 250 g.

Results: the surgery duration and associated risks resulted lower for custom-made miniplates. Patient comfort resulted greater for custom-made miniplates. No complications were observed in patients with custom-made miniplates, whilst mobility, fracture, pain, covering and mucosal inflammation were encountered with non-custom-made miniplates.

Conclusions: the implementation of custom-made miniplates shows promising results. However, due to the limited sample size, further investigations are required to draw a more reliable evaluation of the advantages and clinical implications related to custom-made miniplates.

AMCOP® DEVICE AS A TREATMENT OF CLASS II MALOCCLUSION SECOND DIVISION IN MIXED DENTITION

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Aim: almost one-third of patients requiring orthodontic treatment have Class II malocclusion. The most typical feature of this malocclusion is mandibular retrusion. Considering this topic, the purpose of this study is to describe a clinical case with a Class II skeletal relationship that was successfully treated using the AMCOP® device.

Methods: a 12-year-old female patient had a mandibular retrusion with an ANB angle of 6°. She also had a skeletal and dental Class II relationship. She displayed hypodivergence. She had palatalized central upper incisors and vestibulo-inclined lateral incisors. She had a 7 mm overbite and a 2 mm overjet. Her profile displayed a convexity and a very pronounced mentolabial sulcus.

AMCOP® appliance was used in this case to advance the retrognathic mandible. The patient used the device actively for 1.5 hours throughout the day and passively the entire night. She was required to work on her breathing, swallowing, and chewing throughout the day.

Results: the clinical treatment shows that this case was intercepted and after the cephalometric analysis in T0 and T1 phase, it was verified that the SNB angle continued to increase achieving an ANB = 3°. The divergence has also improved with a FMA angle of 23°. Lip competency, facial convexity, and mentolabial sulcus improved as the mandible advanced. The patient's facial esthetics change was the most impressive part of his treatment.

Conclusions: it is possible to achieve favorable outcomes with functional management in Class II malocclusion patients, using AMCOP® device.

USING CLEAR ALIGNERS AND RUBBER BANDS TO SOLVE A MALOCCLUSION WITH LOWER MIDLINE SHIFT

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Aim: demonstration about the effectiveness of the combined use of orthodontic elastics and Invisalign® aligners in the functional asymmetry of the resolution caused by premature contacts between 2.3 and 3.3.

Methods: 17-year-old female patient in skeletal class I, dental class II in the right hemiarch, dental class II in the left hemyarch, OVB is 4 mm, OVJ is 2.5 mm, the mandibular midline is deviated to the left of 2.8 mm. The treatment included 3 series of Invisalign® aligners and 4.5 oz intermaxillary bands with a diameter of 6.4 mm placed between 1.6 and 4.3 and between 2.3 and 3.6.

Results: treatment lasted 11 months and achieved bilateral dental class I, centered the midlines, reached 2 mm OVB and 2,4 mm OVJ, corrected the dental torque, flattening the curve of Spee with anterior sectors intrusion and middle sectors extrusion.

Conclusions: the combined use of Invisalign® aligners and orthodontic elastics proved to be effective in the resolution of the overcrowded I class malocclusion and mandibular shift.

ORTHODONTIC-SURGERY TREATMENT OF A TRAUMATIZED TOOTH. A CASE REPORT

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Aim: the consequence of intrusive trauma to a deciduous tooth, as well as an abnormality in the structure of the permanent counterpart, may result in an alteration of its eruptive pathway, requiring orthodontic-surgical recovery. Timing of intervention is crucial to reduce the risk of impaction and improve prognosis.

Methods: our healthy patient presented at the age of 9. He reported a history of intrusive type of incisal trauma at the age of 2, as well as permutational anomalies. Radiographically, an anomaly of the eruptive pathway of tooth 21 was observed, with suspected corono-radicular dilatation as a result of the trauma.

Results: the treatment plan involved in a first cycle of rapid palatal expander.

Subsequently, orthodontic surgical treatment was performed with an elastic traction connected to the palatal expander. Upon eruption of the impacted tooth, direct aesthetic restorations were carried out.

Conclusions: it is crucial to promptly identify traumatic events involving deciduous teeth to manage their consequences and operate timely with minimally invasive techniques, as described in this case report.

AUTOTRANSPLANTATION SUPPORTED BY DIGITAL WORKFLOW: AN OPTION FOR SEVERE IMPACTED CANINES

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Aim: following third molar impaction, canines are the second most common evidence of teeth displacement. The canine tooth is relevant for aesthetics and function and its recovery should be performed as soon as possible. Orthodontic traction of impacted canines can be challenging. The disinclusion often requires a multidisciplinary approach and the success is not guaranteed.

Methods: this case report describes the orthodontic treatment of a young male patient, aged 8 years, with a class II malocclusion and transverse maxillary deficiency. The tooth element 1.3 e 2.3 are impacted. Initially it has been executed a rapid palatal expansion to overcome maxillary constriction and deciduous canines has been extracted to promote canine eruption. After two years the canines have not erupted, therefore it has been executed a CBCT exam. The exam showed an altered canine axis that does not allow orthodontic traction. Thus, it has been proposed the autotransplantation procedure following a digital assisted workflow combined to a fixed orthodontic treatment. The canine anatomy has been segmented through Mimics to define the real tooth morphology and dimension. The canine stl file has been imported in Blue sky Bio software to plan its placement and to realize a surgical guide for *in vivo* canine transplantation. The space in the arch has been obtained through fixed appliance, however the real canine dimension required a mesio-distal enamel reduction to allow the *in vivo* placement. Finally surgical extraction and fixation of the canine has performed with Orthodontic fixed appliance.

Results: after six months the canine was stable and vital. The orthodontic treatment has been continued.

Conclusions: the digital workflow guided surgical and orthodontic procedures. The digital planning previsualized the necessity of canine reduction and improved the accuracy of canine placement.

TREATMENT OF A PATIENT WITH CLASS III AND SCARRING RESIDUALS OF CLEFT LIP-PALATE

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Aim: this study examines a patient with III skeletal class malocclusion and residues of cleft lip palate. Patients with cleft lip-palate manifest problems with discrepancies between jaw bones.

Methods: a female patient, 7 years old, with mixed dentition, presented dental-skeletal class III malocclusion with negative overjet. Photos, rx opt, lateral teleradiography, cephalometry, and study impressions were taken and evaluated. It was planned for the first phase of treatment: E.R.P. for the upper jaw and lower plate with an expansion screw for the lower jaw. In the second phase of treatment, it was used Delaire's face mask to guide the growth of the upper jaw in sagittal e vertically.

Results: after 5 months the E.R.P. was removed to add arms with hooks for the elastic bands of Delaire's face mask and then the second phase of treatment had been started. It obtained a significant improvement in the growth and correction of jaw bone discrepancy, with good divergence control.

Conclusions: the interceptive devices are very useful to correct the transverse, vertical, and sagittal bone discrepancy in growing patients, and it is also important to have good patient cooperation in the use of removable devices.

ORTHODONTIC MINISCREW TO PREVENT BONE RESORPTION IN A GROWING PATIENT: A CASE REPORT

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Aim: to evaluate the validity, in contrasting bone resorption, of an orthodontic miniscrew inserted in an agenesis site, perpendicularly to the alveolar process from palatal to vestibular, supporting a prosthetic crown.

Methods: a 14-years old female, with agenesis of the element 1.2, was recruited. After the orthodontic fixed terapy, a CBCT of the maxilla was performed to evaluate the agenesis site. A bone thickness of 3.54 mm was showed. Thus, a self-drilling and self-tapping miniscrew (Orthoeasy Forestadent, 6 mm) was inserted, at the level of the first palatine ruga, with a flapless surgery, after local anesthesia. A prosthetic crown was connected to the miniscrew by a 0.021x0.025 SS wire.

Results: according to the Literature and the pilot study in question (Ciarlantini and Melsen, 2017), the following results should be expected: space and bone preservation for the future implant insertion. A CBCT evaluation of the agenesis site, after 15 months, has shown no radiographical bone loss.
Clinically, the vestibular-palatal width of the alveolar process has not be reduced, since the miniscrew was positioned bicortically.

Conclusions: thanks to oral function, such as chewing and speaking, the miniscrew undergoes stresses that are transmitted to the surrounding bone, with the result of increasing its turnover.
This case report shows a possible temporary solution to replace missing maxillary lateral incisor in a growing patient. To date the patient is fully satisfied with her own aesthetic and function.

ORTHODONTIC EXTRUSION AND SURGICAL CROWN LENGTHENING FOR TREATING A CROWN-FRACTURED TOOTH

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Aim: Orthodontic extrusion (OE) is defined as tooth movement favored by coronally directed orthodontic forces. Several authors proposed OE of fractured teeth, eventually in association with circumferential supracrestal fiberotomy (CSF), to get ferrule effect for prosthetic restorations. In addition, periodontal surgery was described as useful in some cases to re-establish supracrestal tissue attachment dimension after OE. The reported case describes a multidisciplinary approach to recover a fractured tooth, by means of orthodontic extrusion and surgical crown lengthening.

Methods: a 29 years-old female patient reported, after facial trauma, a deep crown fracture of tooth 2.5. After mobile crown fractured fragment removal, the sound tooth margin was detected 6mm apical to the gingival margin at palatal side. Then, OE was performed, to move the tooth coronally, with a 2 weeks routine follow-up. During OE, both endodontic treatment and a composite restoration were performed. After 10 weeks the fracture margin became more superficial, but still subgingival. It was then performed surgical crown lengthening to expose enough tooth structure for the prosthetic restoration. After complete tissue maturation, a monolithic zirconia crown was placed.

Results: the 2 years follow-up showed complete healing and stability of hard and soft tissues. The patient reported satisfaction with aesthetic and functional result.

Conclusions: OE can be a conservative but effective alternative to recover severely damaged teeth. In some cases, surgical crown lengthening is beneficial.

ORTHODONTIC TREATMENT FOR HARMONIC DEVELOPMENT IN GROWING PATIENT: A CASE REPORT

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Aim: dental crowding is still the most widespread orthodontic malocclusion. Early orthodontic treatment allows to work on the patient's growth pattern in order to reestablish the dental arches' harmonious development. The purpose of this case report is to describe a two-stage orthodontic treatment strategy to inducing the correct eruption of permanent teeth in cases of severe tooth crowding.

Methods: this is a case report of a female patient who started the treatment at the age of eight years. Aesthetic and cephalometric analysis of the patient reveals a Class II biretrusion profile, brachifacial biotype, and a horizontal growth pattern. Dental analysis revealed molar class I, palate contraction, and tooth crowding in the upper and lower arches of 8 and 9 mm, respectively. In the orthopantomography, the severe crowding of the upper arch represents a risk factor to the physiological eruption path of the permanent canines. An interceptive phase of orthopaedic expansion of the upper jaw with a HAAS-type expander was performed to increase intraosseous space. Avulsions of the upper and lower deciduous canines, as well as the first deciduous molars, were also performed to enable the eruption of the first definitive premolar and to stimulate spontaneous correction of the canine position. A trans-palatal bar in the upper arch and a lingual arch in the lower arch were applied to preserve the Leeway space. After two years from the beginning of the treatment an orthopantomography was performed to assess the intraosseous position of the canines: the eruption of the permanent canines resulted still obstructed. It was decided to extract teeth 1.4, 2.4, 3.4, and 4.4. After all permanent teeth had spontaneously erupted, the case was refined with 18 months of fixed therapy using self-ligating brackets in the upper and lower arch.

Results and conclusions: crowding was resolved by obtaining the first dental class, correcting overjet and overbite, dental midline coincidence, and closure of the extraction spaces. Early orthodontic treatment combined with serial extractions is a successful strategy for developing an adequate arch size and resolving dental crowding.

ORTHOPEDIC-ORTHODONTIC TREATMENT OF DENTO-SKELETAL OPEN BITE IN A GROWING PATIENT

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Aim: this study aimed to show the treatment of a class II malocclusion with open bite and atypical swallowing through lingual re-education, functional orthopaedics and finally straight-wire technique.

Methods: the case patient was a 9-year-old girl presenting with class II division 1 malocclusion, transverse maxillary deficiency, dento-skeletal open bite and positive overjet. The treatment plan included a first phase with logopaedic myofunctional therapy and bionator II functional appliance with a lingual shield. The patient was required to wear the appliance for about 12 to 14 hours; the upper rebate plane was periodically milled in order to achieve functional expansion of the upper arch. After 4 months of functional tongue re-education and about 10-12 months of application of the orthodontic appliance, a good soft tissue balance and a reduction of the overjet have been achieved. In a second phase, the correct molar and canine class I relationship was achieved through the straight-wire technique.

Results: post-treatment cephalometric values showed an improvement of the sagittal and vertical skeletal relations. Dental changes were also significant including a reduction of the overjet and an increase of the overbite.

Conclusions: the combination of the functional appliance and the logopaedic myotherapy allowed the achievement of hard and soft tissues correct relationships.

The straight-wire appliance finally allowed to correct the dental relationships and to achieve a functional occlusal stabilization.

RAPID DIGITAL PALATAL EXPANSION IN PATIENT WITH CLEFT LIP AND PALATE

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Aim: the rapid palatal expander is a frequently used orthodontic device to treat problems in the developmental age. With full digital techniques today, it is possible to make orthodontic artifacts customized to the patient's morphology and needs from the scanned arch model. The purpose of this work is to illustrate the advantages of the full digital technique in a case of palatal expansion in a patient with dental anomalies and cleft lip and palate by a rapid palatal expander device made by the digital cad-cam method.

Methods: the male patient, aged 8 1/2 years, presented with severe palatal contraction, severe crowding, incomplete cleft lip-palate and soft palate cleft, crossbite from 5.4 and 2.1, and hyper-divergent third dental-skeletal class. Elements 5.5 and 6.5 were found to be microdontic to accommodate the bands so it was evaluated to use an expander made by a complete digital technique using study models reprocessed with the scanner and transformed into STL files. The expander was cemented with the adhesive technique and the expansion protocol included 1 lap every 2 days for 42 days obtaining 5 millimeters of expansion.

Results: the crossbite was resolved by expansion by increasing the arch perimeter without incurring appliance debonding.

Conclusions: the full-digital technique allowed the fabrication of the custom device to be perfectly stable and adherent, despite the impossibility of inserting classic bands. Rapid digital palate expander eliminated the need for separators and the subsequent band trial appointment, redeeming the procedure faster and more comfortably for the patient.

MANDIBULAR PROPULSION THROUGH MAGNETIC ATTRACTION DEVICES

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Aim: the following case report describes the development and use of a new magnetic mandibular advancement device, evaluating its efficacy and its effects during the treatment of a patient affected by OSAS.

Methods: in the specific clinical case, the patient was treated in the dental clinic of the University of Messina using an experimental magnetic mandibular advancement device, in which passive mandibular propulsion was determined through the attraction of rare-earth magnets embedded in the thickness of thermoformed PET-G masks. This device is able to change the mandibular position leading to an increase in the patency of the respiratory tract, and reducing the resistance at the level of the nasopharyngeal tract. The device was delivered ti the patient and it was tested its advancement mandibular efficiency. It was ask the patient to wear the device every night. The following parameters were evaluated every 3 months. AHI (apnea-Hypoapnea Index), ODI (Oxigen Desaturation Index).

Results: a new polysomnographic examination was carried out at 3 and 6 months after the start of the mandibular magnetic attraction advancement device therapy. Compared with the pre-treatment values of AHI (24.8) and ODI (27.3), a progressive reduction was observed at three months after the start of treatment and a further decrease at six months; the AHI and ODI values were 11.0 and 10.6, respectively, at three months and 8.1 and 9.7 at six months.

Conclusions: the propulsion mandibular magnetic device was an efficient therapy for the resolution for moderate degree OSAS.

TWIN BLOCK IN HYPERDIVERGENT SECOND-CLASS THERAPY

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Aim: this study examined a case of hyperdivergent Skeletal class II treated with removable Twin Block orthodontic therapy. The Twin Block is an effective mandibular advancement device in class II malocclusions with mandibular retrusion that allows good control of verticality through posterior resin planes. All class II appliances increase the vertical dimension, which in hyperdivergent subjects is a side effect that should be avoided.

Methods: female patient, 10 years old, with mixed dentition, presented dento-skeletal class II malocclusion, hyperdivergent grown pattern, contracted arches and increased overjet (OJ). Cephalometric values ANB 5.9°, SNA 82°, SNB 76°, FMA 32°. The construction bite was made in a head-to-head relationship. To correct the transverse contraction of the upper and lower arches, an expansion screw was inserted into both the upper and lower plates, activating it 1 turn per week. The appliance was worn at least 14 hours a day for approximately 2 years.

Results: after 14 months, there was a significant improvement in the Class II with good divergence control. Final cephalometric values demonstrated a reduction in ANB of 3° and an increase in SNB of 3°, a reduction in FMA of 2.8°.

Conclusions: from the results, it is concluded that the Twin Block can be considered a valuable appliance for the resolution of mandibular retrusion second classes in growing subjects, allowing control of verticality, a key feature in hyperdivergent patients. Being a removable appliance, it is important to have good patient cooperation for malocclusion correction.

PREDICTABILY OF MAXILLARY EXPANSION WITH CLEAR ALIGNERS IN MIXED DENTITION

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Aim: the aim of this preliminary study was to evaluate the predictability of upper arch expansion in patients in mixed dentition treated with clear aligners.

Methods: the investigation was conducted on a sample of 44 patients (24 females and 20 males) treated with Invisalign First (Align Technology, Tempe, AZ, USA) clear aligners. The expansion planned with the ClinCheck software at the beginning of the treatment was compared with the expansion achieved at the end of the treatment, measured on the digital impressions. The expansion was measured at deciduous canines, deciduous molars and first permanent molars both at gingival and cuspidal level.

Results: the average age was 9,7 years and the average number of aligners used for the treatments was 26. The average predictability at cuspidal level was 59,7% for deciduous canines, 63,77% for deciduous first molars, 66,99% for deciduous second molars and 55,61% for permanent first molars, while at gingival level was 48,87%, 53,11%, 53,36% and 45,16% respectively.

Conclusions: with clear aligners it is possible to expand the upper arch in a predictable way. The predictability ranges between 45% and 67%. A key role is determined by overcorrection and digital treatment planning.

ALT-RAMEC PROTOCOL FOR THE TREATMENT OF THIRD SKELETAL CLASSES: A CASE SERIES

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Aim: the aim is to analyse the validity of the Alt-RAMEC protocol (Liou et al. 2003, 2005) for the correction of the skeletal class III malocclusion in a group of 9 patients (3 male with complete unilateral cleft lip and palate and 6 non affected female) between 9 and 12 years old.

Methods: after analysing orthopantomography, latero-lateral teleradiography, cephalometry, clinical photographs and plaster templates, the treatment plan is outlined following the Alt-RAMEC protocol, modified from the original (Yen Protocol, 2011). A double-fan expander is cemented with bands on first permanent molars and first premolars, with palatal arms up to the centrals and vestibular arms up to the canines with hooks for the Delaire mask, and a lingual arch cemented on first permanent molars with vestibular arms up to the canines with hooks for the third class elastic bands. For 7 weeks the activation was carried out every other week in opening and closing. The upper jaw has been shown movable, therefore the traction phase was started using the nocturnal Delaire mask and diurnal intraoral elastic bands.

Results: the skeletal class III malocclusion improves with therapy with evident upper jaw advancement and mandibular post-rotation.

Conclusions: in conclusion, it can be said that the Alt-RAMEC protocol is effective in correcting the skeletal class III malocclusion both in patients with complete unilateral cleft lip and palate and in non-affected patients.

THE TREATMENT OF OPEN BITE AS A CONSEQUENCE OF CONDYLAR PROCESS FRACTURES

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Aim: the most common malocclusion because of mandibular condyle fracture is Anterior Open Bite (AOB). Aim of the study is to evaluate different outcomes based on the use of four different functional treatments in patients with AOB.

Methods: we included patients with uni/bilateral condylar fractures with AOB (t_0). Patients were divided into 4 classes on the basis of AOB width and then referred to 4 different treatments. We proposed: a) orthodontic device, with sectional orthodontic wires and use of intermaxillary elastics; b) orthodontic device, anterior elastics and intermaxillary elastic traction with class II component; c) Intermaxillary Fixation (IMF) screws on maxilla and multi-brackets appliance on lower arch with the intermaxillary elastics to obtain rotation of the lower occlusal plane; d) monitoring and physiotherapy exercises. A second measurement was performed after 1 year of post-treatment follow-up (t_1).

Results: among 31 patients having 41 condylar fractures, 10 patients presented AOB (range 1-6 mm). At time t_0: 1 patient with AOB = 1 mm was treated by D therapy; 2 patients with AOB = 2 mm were treated by A therapy; 1 patient with AOB = 2 mm was treated by C therapy; 6 remaining patients with AOB range 3-6 were treated by B therapy. At time t_1 all patients had an open bite equal to zero.

Conclusions: accurate choice of treatment based on evaluation of the post-traumatic AOB leads to resolution of AOB in 100% of the sample.

MASTICATORY FUNCTION EVALUATION WITH CLEAR ALIGNERS: A PRELIMINARY STUDY

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Aim: the aim of this study is to objectively assess the masticatory function of subjects with transparent aligners, to obtain an evaluation about the wearing of these devices even during meals, to extend the time of use and thus the effectiveness of the treatment. Although the Invisalign® aligners are minimally invasive, is necessary to estimate whether the aligners' thickness compromise the chewing ability. An effective method of assessing masticatory function is the mixing test by using of two-coloured chewing gums and an optoelectronic analysis software.

Methods: it was used the ViewGum© software to detect the degree of mixing of two-tone chewing gum. 20 participants, with full dentition, a maximum DMFT index of 4 and without diagnosis of temporomandibular disorder were involved. To each subject was asked to chew two Hue Check Gum® chewing gums in two different colours (blue and pink) for 5, 10, 20 cycles with and without aligners. The samples were then pressed to 1 mm and scanned on both sides.

Results and conclusions: it was possible to take over that aligners do not cause alterations in masticatory function while they are worn, therefore the clinician can take advantage of the using of the aligners for chewing to obtain a better fitting of the plastic material to the dental surface and to the attachments and for the patient's benefit, in order to reduce the treatment time. The tests performed with Hue-Check Gum®, proved how the number of chewing cycles modify colour mixing results. From the comparison of the groups with and without aligners, with same numbers of cycles, the statistical analysis of the results obtained didn't show any statistically significant differences.

PROSTHETICALLY GUIDED ORTHODONTICS (PGO): INTREGRATION OF ORTHODONTICS AND PROSTHETICS

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Aim: treatment of partial prosthesis or the placement of veneers are typically involved in conformative rehabilitation. In this context, conformative rehabilitation is interested in creating an aesthetic prosthetic solution with the minimal possible of tissue removal while preventing the generation of occlusal input.

Methods: pre-prosthetic orthodontics aims to restore the perfect location or inclination of the adjacent or antagonist teeth, creating adequate space for the prosthetic crown. Clear aligners therapy (CAT) is an important tool in the management of prosthetic cases with a conformative approach. In the present study, we present and illustrate the concept of prosthetic guided orthodontics (PGO). In particular, we discuss three cases that were treated with the Invisalign GO system, which was created for the clinical management of multidisciplinary orthodontic-prosthetic cases with a conformative approach.

Results: all patients presented showed excellent functional and aesthetic outcomes. A comprehensive approach is necessary for aesthetic rehabilitation in order to meet patient expectations and preserve orofacial biological and functional principles. The use of prosthetically guided orthodontics (PGO) maximizes the maintenance of biological tooth preparation parameters and the efficacy of cosmetic rehabilitation.

Conclusions: clear aligner treatment (CAT) offers dentists a thorough digital planning tool for pre-prosthetic orthodontic movement and a clear aligner cosmetic orthodontic solution.

MANEUVERS CAN BE CARRIED OUT TO HELP ERUPTION OF ECTOPIC CANINES: SOME CASES

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Aim: among clinical orthodontic conditions requiring early interceptive treatment include dental inclusion of the maxillary canine. The absence of maxillary canine in the dental arche influence the aesthetics of the smile, being located in the angle on the dental arch that marks the transition between the anterior and the posterior teeth , and negatively affects the physiology of the chewing process, given its important guiding role during the chewing processes and mandibular in laterality (canine guidance).The aim of the study is to evaluate if the early extraction of the primary canine may constitute a manouvre valid for avoiding surgery for help eruption of ectopic canine. Scientific studies suggest that early extraction of deciduous canine could represent a valid alternative to the surgical-orthodontic approach.

Methods: we have analyzed the cases with ectopic canines, evaluating the different path taken by the tooth and the resolution of problem using which manouvers early extraction of the primary canine, and guided surgical therapy is required. Physical examination of oral cavity, medical history, intraoral photographs, orthopanoramic of the dental arches, lateral teleradiography were used in this study.

Results: the results of our study showed that early extraction of the deciduous canine in case of bone malposition of the permanent canine is a therapeutic aid in 80%of cases in patients between 10 and 13 years.

Conclusions: this approach couldn't guarantee the resolution of the problem.

TIMING IN TREATMENT OF CLASS III DENTOSKELETAL MALOCCLUSIONS DUE TO MAXILLARY DEFICIENCY

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Aim: highlight the importance of timing in the treatment of patients with class III dento-skeletal discrepancy with upper jaw deficiency.

Methods: three cases were analyzed at three different stages of growth (childhood, adolescence, adulthood) using the growth indices sought on PubMed, Scopus, The Cochrane Library until November 4, 2022 (vertebral index, open apex waiter method, second waiter molar indices, waiter's third molar index) for the choice of treatment in Border Line cases. The 3 clinical cases were treated at the Department of Orthodontics of the University of Cagliari.

Results: in the child there were good results with orthopedic therapy (Rep and mask), in the adult patient the treatment of choice was found to be orthognathic surgery, in the adolescent patient examined correction was achieved with orthopedic and orthodontic therapy.

Conclusions: n class III adolescent patients, growth indices are an important aid in the choice of treatment, as the age of the registry is not always correlated with the biological age of the patient. Therefore, the use of such indices allows adolescent patients to discriminate between orthopedic and orthognathic treatment allowing them to carry out a specific therapy for each individual patient, based on the values obtained with interceptive therapy in pediatric age pre peak growth and those of adulthood where there is no room for development.

DOES LIP BUMPER THERAPY INCREASE THE RISK OF SECOND MOLAR IMPACTION? A LITERATURE REVIEW

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Aim: the aim of this literature review is to investigate if lip bumper appliance increases the risk of second molar impaction.

Methods: this research has been conducted on the following databases: PubMed and Science Direct. The keywords used were: "lip bumper" AND "second molar impaction". The studies published from 2010 to present day were included, while book or book chapters, abstract and editorials were excluded.

Results: the research produced 30 results, of which only 4 met the inclusion criteria. Lip bumper therapy significantly increases the risk of second molar impaction. The negative predictors impaction were: the second molar's angulation greater than 30 degrees, and the initial anterior crowding. Incorrect fitting of the first molar bands but also incisal lip bumper position have been noted as the possible causes for second molar impaction.

Conclusions: the studies demonstrates that lip bumper is associated to a greater risk of second molar eruption disturbances like impaction and ectopic eruption, but the evidence was of very low quality. Methodologically sound prospective clinical trials are deemed necessary to provide higher levels of evidence.

THERAPEUTIC STRATEGIES OF PRIMARY MOLAR INFRAOCCLUSION: A SYSTEMATIC REVIEW

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Aim: infraocclusion of deciduous molars is a clinical disturbance that occurs during primary and mixed dentition and has some orthodontic implications. Infraoccluded teeth are believed to be potential sites of malocclusion, with a risk of tipping neighbouring teeth and losing space. This systematic review investigated the management of primary molars infraocclusion and gives an update guideline.

Methods: a literature search was performed using PubMed, Scopus, and Web of Science databases from 1 January 2017 to 28 November 2022 using this keyword: ("infraocclus*" OR "ankylos*" OR "submer*" OR "secondary retention") AND "molar". The inclusion criteria were: studies only on human subjects; open access studies, case reports, randomised trials, retrospective, and observational studies, and English language. In addition, studies that dealt with treatment and not studies on diagnosis and prevalence or correlation were selected.

Results: a total of 372 publications were identified from the databases and a final number of 9 studies were included in the review for qualitative analysis.

Conclusions: management of patients suffering from infraocclusion depends on the severity, age at diagnosis and presence of succeeded premolars. Early diagnosis of infraoccluded primary elements is fundamental and cannot be postponed. Preservation of the primary molars may be a valid option with long-term stability if there is no or moderate primary molar infraocclusion, root resorption of less than half of the root, and no decays or restoration.

A NARRATIVE REVIEW OF THE EFFECTS OF FR-4 IN THE TREATMENT OF AOB

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Aim: anterior openbite (AOB) is a malocclusion in which patients are unable to properly occlude with the anterior teeth and occlusion only happens in the posterior region.

For its multifactorial etiology it is difficult to treat effectively AOB. One of the possible treatments for the AOB is with the Frankel's function regulator IV appliance (FR-4). The aim of this study is to review the effectiveness of this device.

Methods: a search was conducted on Pubmed typing "(Fr OR Frankel) AND openbite" with no time range and without other filters. The results were 91 articles but only 7 were selected for the review process since the others were not pertinent to the specific argument of this review.

Results: although the treatment of the AOB is difficult, all the 7 studies analyzed have shown that the association of FR-4 with lip-seal training is a good option to correct the AOB malocclusion, according to the hypothesis of a postural etiology of the AOB.

In agreement with the articles reviewed, the FR-4 can produce or just skeletal effects, or only dentoalveolar effects, or both skeletal and dentoalveolar effects.

In the clinical trial of E Erbay et All in the treated group AOB was successfully corrected through upward and forward mandibular rotation, in accordance with the study of Frankel and Frankel.

Differently from them, B Haydar and A Enacar proved that FR-4 did not produce an anterior rotation of the mandible but rather caused backward rotation of the mandible.

Conclusions: despite the articles reviewed have shown that FR-4 is effective to treat AOB, further studies are needed to establish this with certainty.

EVALUATION OF RESPIRATORY PARAMETERS IN PATIENTS TREATED WITH FUNCTIONAL DEVICES

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Aim: the main objective of our study was to evaluate the clinical appropriateness of Mallampati score in patients with potential sleep disorders treated with functional orthodontic devices.

Methods: patients of the orthodontic operative unit of Rho hospital, age between 7 and 14 years old, needing an orthodontic therapy with functional appliances were evaluated. Patient were assessed at three time points evaluating the Mallampati score, a sleep questionnaire and panoramic radiographs and lateral cephalometric teleradiographs.

Results: 100 patients met the inclusion criteria and were enrolled. The 36% of the patients had a skeletal class I while the other 64% had a skeletal class II. The Mallampati score at T_0 was as follows: Mallampati II 47%, Mallampati III 38%, Mallampati IV 15% and the entity of sleep disorders reported in the questionnaire followed the trend of the Mallampati score. At T1, after 12 months, and at T2, after 15-20 months there were similar results: the 76% of Mallampati III and 47% the Mallampati II patients showed a decrease of the score while patients with stage IV were often diagnosed with macroglossia and only in the 30% of cases there was an improvement.

Conclusions: Mallampati score is a useful and appropriate index for the evaluation of respiratory parameters but we suggest to use it in association with other clinical and radiological indices for the purpose of a more complete evaluation of the patient without the use of further instrumental tests.

A QUESTIONNAIRE ABOUT LIFESTYLE, FOOD HABITS AND ORAL HYGIENE DURING INVISALIGN TREATMENT

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Aim: this study aims to collect data on home oral hygiene habits before and during treatment with aligners, the hygiene of aligners, eating habits and lifestyle, to elaborate a protocol to present.

Methods: this study was conducted on 35 patients (32 M, 23 F, 18-66 years old) at the department of oral Hygiene at the Vita Salute San Raffaele university - Milan.

A 35-question survey (divided into 6 sections) addressed the following aspects: home oral hygiene habits before and during treatment, the maintenance of aligners during the daily routine, eating habits, and lifestyle. The survey included a final question on how the Invisalign clear orthodontics aligners changed over time according to the patients.

Results: this study shows positive changes in home oral hygiene and lifestyle thanks to the motivation and education that most patients received at the beginning of orthodontic treatment.

Almost half of the patients use the same aids to clean the aligners that are used for home oral hygiene: toothbrush and toothpaste.

Patients notice a loss of transparency and yellowing of their aligners at the time of the change.

Conclusions: patient compliance and positive behaviour are essential for the therapy to be successful.

Further clinical studies with larger samples are needed to obtain more data and develop an ideal hygiene protocol to follow.

ASSESSMENT OF NEUROMUSCULAR STABILITY OVER TIME POST-ORTHODONTIC TREATMENT

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Aim: the study aims to evaluate the neuromuscular stability post-orthodontic treatment in patients wearing a splint fixed retainer and a removable retainer on the upper arch.

Methods: we evaluated 70 patients (39 males and 31 females) aged 14 to 25 years. Only healthy patients with no history of TMJ dysfunctions, craniofacial syndromes, or periodontal disease were accepted.

We analyzed the occlusal stability using Teethan surface electromyography system. The test was performed at different times.

The first test was at the time of debonding, which we considered as T_0. Then every year, we performed a new test: at 12, 24, 36, 48 and finally at 60 months from T_0.

Results: we analyzed all data through the Wilcoxon test ($p = 0.05$) to identify if there was statistical significance. All patients had normal and symmetrical occlusion at T_0. The data did not show any statistical difference between the different times. The only difference we found was between T_0 and T24 on the IMPACT data. However, this was only a statistical difference with no clinical consequence since there were no variations in the others follow-up. No significant difference was found in the other variables (POC, ASIM, BAR and TORS) during the follow-up period.

Conclusions: it is possible to assume that the fixed retainer from 3.3 to 4.3 and Essix on the upper arch maintained the occlusal and neuromuscular stability during the time.

CHARACTERISTICS OF RESPONDERS AND NON-RESPONDERS TO MAD SIMULATOR DURING DISE

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Aim: to compare the characteristics of responders and non-responders to mandibular advancement during drug-induced sleep endoscopy (DISE) in adults with obstructive sleep apnea (OSA).

Methods: this retrospective cohort study included 295 patients with a polygraphic diagnosis of OSA who underwent DISE with mandibular advancement simulator at 75% of antero-posterior mandibular excursion in order to predict the success of mandibular advancement device (MAD) therapy. The patients were monitored with a portable polygraphy set; obstruction sites were endoscopically evaluated. Success was defined by resolution or significant improvement of the apnea hypopnea index (AHI) for at least 5 minutes, associated with endoscopic evidence of improvement of the upper airway patency.

Results: non responders showed statistically significant higher body mass index compared with responders, with no differences being observed for age and sex. Responders had less severe polygraphic parameters at baseline (AHI, supine AHI, non-supine AHI, oxygen desaturation index, percentage of time spent at oxygen saturation below 90%, lowest oxygen saturation), except for mean oxygen saturation.

No between group difference was found for the percentages of obstructions at the velopharynx, tongue base and epiglottis level, while responders showed a lower percentage of obstruction at the oropharyngeal level compared with non-responders.

The number of obstruction sites did not differ between the groups.

Conclusions: lower body mass index, less severe polygraphic parameters at baseline and significantly reduced percentage of obstruction at the oropharyngeal level seem to characterize good responders to MAD simulator.

ELASTODONTIC THERAPY IN HYPERDIVERGENT CLASS II PATIENTS: A RETROSPECTIVE STUDY

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Aim: a skeletal class II malocclusion is frequently characterized by a retrognathic mandible and a hyperdivergent pattern of growth, which requires an appropriate treatment plane. The current study investigates the efficacy of elastodontic treatment using AMCOP® devices in treating children with hyperdivergent class II malocclusions, as well as the impact on upper airway patency.

Methods: the trial group included of 21 patients (10 males and 11 females) who had hyperdivergent skeletal pattern and a class II malocclusion treated with AMCOP® devices. AMCOP® devices were used on the patients for an average of 16-18 months. In severe high-angle subjects, AMCOP® OPEN was used first for 6-8 months, followed by the SC device; in slightly increased angle cases AMCOP® INTEGRAL was used first for 6-8 months, followed by the SC device. Cephalometric analysis was done both before (T_0) and after therapy (T_1).

Results: after treatment, cephalometric study demonstrated a correction of the class ii malocclusion and a change of the development pattern with a decrease in divergence. There was also an improvement in upper airway space.

Conclusions: in growing patients, elastodontic treatment might be efficient in class II hyperdivergent malocclusion. The long-term stability of the acquired results has yet to be determined, and more research is necessary.

CLEAR ALIGNERS TREATMENT OF A PATIENT WITH CLASS I MALOCCLUSION AND MULTIPLE DIASTEMAS

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Aim: multiple diastemas in a teenage patient are an issue because they not only affect the appearance of the smile but can also have severe psychological effects. The purpose of this study is to demonstrate the efficacy of clear aligner orthodontic therapy.

Methods: a 16-year-old teenager with permanent teeth is the subject being treated. In frontal view, he exhibits a symmetrical face on extraoral inspection; nevertheless, in lateral view, the profile looks convex with a decrease of the lower third of the face. The patient exhibits a right and left first canine class as well as a right and left first molar class during an intraoral examination. He has a diffuse spacing between the upper incisors, an increased overjet, and a lower midline that is off to the left of the upper midline in the frontal view.

Results: after a 12-month of therapy, the upper and lower jaw diastemas were completely closed, and the deep bite was corrected by flattening the Spee curve.

Conclusions: the patient benefited from a noticeable improvement in facial aesthetics after the procedure. The upper diastemas have been closed, improving the incisors' exposure to the grin, which now appears more pleasing and in line with the lower lip edge.

BILATERAL CROSS-BITE CORRECTION USING A RAPID PALATAL EXPANSOR IN MIXED DENTITION

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Aim: the posterior crossbite is a very common malocclusion. Expanding the maxilla in patients with mixed dentition using the rapid palatal expansion has a positive impact on the treatment of associated deficits.

Methods: a 9-year-old male patient came to our attention with a skeletal and dental Class II relation by mandibular retrusion. He exhibits a hyperdivergent tendency. His upper incisors were very vestibolarized and the inferiors are normal. He had 2,5 mm of overjet, 4 mm of overbite. The following factors were revealed on oral examination: diastema between the central incisors and lack of space for lateral incisors eruption, bilateral posterior cross-bite and functional deviation of the median line. The patient received treatment with a Hyrax-modified type expander (A0621-11 "Micro" expansion screw, Leone, Italy) anchored on the first permanent molars.

Results: clinical treatment shows that this case was intercepted and after intraoral and cephalometric analysis in T_0 and T_1 phases, it was verified that the bilateral posterior cross-bites were resolved. Lip proficiency, facial convexity, and mentolabial sulcus improved with advancing mandible. The patient's facial and dental aesthetics change was the most impressive part of his treatment.

Conclusions: it is possible to obtain favorable results in both the transverse and sagittal planes in patients with Class II malocclusion using the RPE.

REHABILITATION OF UNILATERAL CROSSBITE USING INVISALIGN® AND RUBBER BANDS: A CASE REPORT

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Aim: orthodontic and functional rehabilitation in a III skeletal class patient with unilateral crossbite using Invisalign® clear aligners and III class rubber bands.

Methods: a healthy 40.6 years old female patient presented with a III skeletal and dental class malocclusion with hyperdivergence and open bite, facial asymmetry and unilateral cross (21-25), presence of diffuse and accentuated gingival recessions in the cross side. Temporomandibular disorders with pain and clicking, masticatory difficulty and absence of anterior canine guides were detected. The patient declined to undergo maxillofacial surgery. Treatment with Invisalign® aligners and III class rubber bands was performed to resolve dental and functional issues and improve smile and facial aesthetics. The treatment involved the use of 3 sets of aligners for 24 months with weekly replacement, III maxillary class rubber bands (4 oz., ¼") and final retainers with Vivera system.

Results: this technique allowed intrusion of the posterior segments and extrusion of the anterior elements with resulting closure of the open bite and anterotation of the mandible. It also allowed superior dentoalveolar expansion with compensation of the torque values without worsening gingival recessions. I class dental relations were obtained with resolution of TMDs. Facial and smile aesthetics were greatly improved.

Conclusions: the use of this technique has achieved good aesthetic and functional results avoiding the surgery.

POSTERIOR CROSSBITE CORRECTION BY CLEAR ALIGNERS: IS IT POSSIBLE?

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Aim: the aim of this Case Report is to treat a patient with class III malocclusion characterized by unilateral cross bite with clear aligners.

Methods: the treated patient presented on intraoral objective examination with a bilateral third molar class and monolateral cross on the right side. The cephalometric analysis revealed an ANB (^)-2.8. The patient refused orthodontic surgical treatment and therefore compensation treatment was carried out using clear aligners.

Results: the photo documentation and instrumental diagnostic records were collected before and after treatment and showed how the orthodontic device of serial clear aligners was able to successfully treat the malocclusion. At the end of therapy, intraoral objective examination, revealed adequate correction of the unilateral crossbite and a first dental class relationship. Post-treatment cephalometric analysis showed good control of vertical dimension and anterior limit of dentition. Objectives were achieved. The following arrangements were used: 1. Hypercorrection of anterior and transversal expansion was carried out on set-up. 2. To reduce linguo-buccal tipping of premolars and molars attachments with gingival undercuts were used on all teeth in cross. 3. Was asked to the patient to wear a criss-cross elastic on the second molars. A one-year follow-up with photo documentation was carried out and the result obtained is stable.

Conclusions: the use of clear aligners may be a valid device for the correction of a class III malocclusion with monolateral crossbite when the patient's refused elective surgical therapies.

A THIRD DENTO-SKELETAL CLASS WITH AN ANTERIOR OPEN BITE TREATED USING DAMON TECHNIQUE

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Aim: to show the success of a Damon approach (passive self-ligating) orthodontic procedure in a case of third-class dento-skeletal malocclusion, with an anterior open bite and moderate tooth crowding in both arches.

Methods: the case in question involves a 16-year-old patient who displayed good facial symmetry on external frontal examination. The patient presented as a hyper-divergent patient, with the middle-lower third increasing in proportion to the other two on the exterior profile analysis. The case was handled using fixed multibracket equipment with the Damon technique. Early class III elastics (2.5 oz 1/4) and vertical nocturnal canine-canine elastics (2.5 oz 1/4) were applied first on round arches (0.14 Cuniti, 016 Cuniti sequence), and then class III elastics (6 oz 1/4) and rectangular 14 x 25 Cuniti and 18 x 25 Cuniti arches were used in combination with them. Each three months, every wire was replaced. About 18 months were spent on active treatment and the stabilization, by which the outcome was achieved, was done using a retainer essix.

Results: by using the Damon technique, this orthodontic therapy was able to close the anterior spaces correctly and produce proper occlusion overall by obtaining an acceptable dento-alveolar compensation.

Conclusions: as a result, we show how passive self-ligating brackets and elastics work well together to produce a wonderful result from a dental and facial perspective, not to mention the positive effects of the new smile on the patient's quality of life.

SLOW EXPANSION IN MIXED DENTITION WITH THE QUAD HELIX: CASE REPORT

Carpentiere V.

Aim: to evaluate the therapeutic effect of the quad helix in a 9-year-old girl with dental crowding in both arches.
Methods: in this clinical study, the patient in the mixed dentition presented a reduced arch space in both jaws.
RX OPT, lateral skull RX, impressions of the dental arches, cephalometric analysis and initial photos of the case are carried out.
After a careful evaluation of the data obtained, it was decided to proceed with the insertion of a quad helix on the upper arch to obtain dento-alveolar expansion.
Every four weeks the appliance was checked and if necessary an appropriate intraoral activation was carried out.
Results: after 9 months of therapy the quad helix was removed and the therapy continued with the application of a superior utility archwire to correctly reposition teeth 11 and 21.
After 12 months of therapy it is possible to observe the resolution of the crowding teeth and good arch shape.
Conclusions: the use of the quad-helix in mixed dentition allows to obtain a dimensional gain of the intercanine and intermolar diameters and a greater symmetry of the dental arch.

ORTHODONTIC TREATMENT TO PREVENT INCLUSION OF THE PERMANENT MAXILLARY CANINE

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Aim: to demonstrate the potential of early treatment with rapid palatal expander and primary canines extraction to prevent maxillary canines inclusion.
Methods: the patient in early mixed dentition showed molar class I relationship and the presence of a conoid right lateral incisor. The radiographic evaluation made evident a deviation from the correct maxillary canines eruptive path. The treatment started using a RME appliance with bands on 55 and 65 and one daily activations for twenty five days. After 6 months the 5.3 and 6.3 elements were extracted. After the palatal expansion, the RME passively provided to retention for one years, then it was removed and a schwarz appliance was applied to maintain the space for permanent canines. After 12 months, the radiographic check showed an improvement of the correct eruptive path of the maxillary canine and after 18 months the 1.3 element appeared in the maxillary arch.
Results: after 18 months of orthodontic therapy, the spontaneous eruption of tooth 13 and the improvement of the pattern of eruption of 23 demonstrates the efficacy of the synergy of treatment with RME followed by early extraction of the primary canines.
Conclusions: as we find in literature, early intervention on the direction of eruption of the maxillary permanent canines makes it possible to reduce the incidence of the canine impaction and improve patient comfort since, if necessary, the second phase of treatment will certainly be faster and comfortable.

CORRECTION OF POSTURAL ASYMMETRY USING MYOBRACE® INTEGRATED IN A PHYSIOTHERAPY PROGRAM

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Aim: the term posture refers to the upright position in which there should be an alignment of the segments of the human body with each other and of the body with respect to space. In the determination of posture comes into play information provided by several districts, including the position of the jaw and the tongue.
The purpose of this case report is to describe the treatment of a postural asymmetry, characterized by elevation of the left shoulder and elevation of the right iliac wing, contextual to a mandibular deviation to the right, in a 13-year-old patient with Down syndrome and scoliosis spinal using a preformed myofunctional device, integrated into a physiotherapy program.

Methods: Myobrace® is a preformed silicone orthodontic device that is able to correct bad habits, promote the correct shape of the arch and the development of the jaws. It can change the posture of the jaw; in fact, if it worn during the night, for 10-12 hours, as indicated by the manufacturer, it induces neuromuscular re-education by forcing the jaw into a correct position.

Results: the use of a myofunctional oral device, integrated in physiotherapy, has allowed to obtain an improvement of postural asymmetry.

Conclusions: this case report confirms the need to consider the correction of an altered postural relationship of the jaw in a physiotherapy plan.

MAXILLARY MOLAR DISTALIZATION THERAPY WITH DISTAL SCREW: CASE REPORT

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Aim: the aim of this clinical case is to describe and verify the efficacy and efficiency of the terapy with Distal Screw.

Methods: a 14-year-old male patient arrived at the polyclinic of the University of Messina for a first dental visit. Dental examination reveals: agenesis of 1.2 and 2.2, bilateral molar and canine class II and deep-bite. We opt for distalization of the maxillary molars and subsequent space recovery for the replacement of the missing teeth. The first phase of treatment involved insertion of the Distal-Screw: after seven months, a bilateral class I relationship was obtained. A multibracket device of the Empower type was therefore positioned on the maxillary arch. We used a sequence of arches which allowed resolution of the crowding and distalization of the canines. After space opening, a Maryland bridge was applied to the upper arch while waiting for the final implant-prosthetic rehabilitation.

Results: the treatment allowed to obtain: resolution of the crowding in both dental arches, bilateral molar and canine class I, correction of the overjet and overbite, coincidence of the median lines, correction of the occlusal plane and space opening necessary for the implant-prosthetic rehabilitation of agenetic 1.2 and 2.2.

Conclusions: the Distal Screw seems to be effective in molar distalization and it doesn't cause any type of undesirable effect. The screws are stable during treatment and do not produce inflammation of the soft tissues.

TREATMENT OF A SEVERE DEEP BITE WITH CLEAR ALIGNERS

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Aim: to describe the orthodontic treatment of an adult patient with Class II malocclusion and deep bite with the use of clear aligners (CA).

Methods: a 19-year-old male patient presented to the Orthodontic department of "Federico II" University of Naples, with protruded upper frontal teeth, convex profile, a full permanent dentition, molar and canine Class II with increased overjet and overbite. Cephalometric tracing revealed a skeletal Class I relationship (ANPg = 3.9°), with hypodivergent growth pattern (SN/Go-Gn = 22.5°), and normal lower incisor inclination (L1/Go-Gn = 96.1°). The patient was treated with CA and Class II elastics, and the extraction of upper third molars was programmed one week before starting treatment. Treatment consisted of 54 aligners for each arch, with a weekly change protocol. The working set-up included a sequential distalization of upper arch (50% protocol), and a simultaneous staging for the leveling of the Curve of Spee. A finishing phase of 16 aligners was required.

Results: at the end of the treatment (after 1.5 years), molar and canine Class I relationship with a flat occlusal plane was achieved. Superimposition of pre- and post-treatment cephalometric tracings showed distal crown tipping and intrusion of upper first molar, extrusion and mesial crown tipping of lower first molar, and proclination of lower incisor (L1^GoGn = 102.1°) of 6°.

Conclusions: the use of CA with Class II elastics and the extraction of upper third molars can be an alternative for the correction of both Class II malocclusion and deep bite.

CLEAR ALIGNERS TREATMENT OF LATERAL INCISOR AGENESIS: A CASE REPORT

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Aim: missing maxillary lateral incisors create an aesthetic and functional problem with specific orthodontic and prosthetic considerations. The purpose of this case report is to describe a case of agenesis of the right maxillary lateral incisor treated with aligners and upper frontal teeth camouflage.

Methods: an eleven-year-old female patient was reevaluated following previous interceptive therapies with rapid maxillary expander and Frankel II. At the clinical exam she presented a bilateral class II with agenesis of 1.2, reduced size of 2.2, 1.3 incorrectly located. It was performed a diagnostic check-up of the patient and a digital planning of the orthodontic treatment with aligners to achieve a satisfactory occlusal relationship and an appropriate position of the frontal teeth. In fact, it was planned to perform a space closure of the 1.2 and a conservative rehabilitation by performing 1.3 camouflage and conservative treatment to the upper frontal teeth. After aligner treatment the conservative reconstruction of the teeth was performed and followed by a finalization with another aligners phase.

Results: at the end of the therapy, the patient achieved a good functional and aesthetic goal. A good control of the space closure and of the torque of the 1.3 root was achieved with clear aligners treatment.

Conclusions: clear aligners can be useful in performing multidisciplinary orthodontic and conservative/prosthetic rehabilitations achieving a predictable final position of the frontal teeth even in cases that require specific biomechanical needs.

MINIMALLY INVASIVE ULTRASONIC APPROACH TO ORTHODONTIC DEBONDING: AN *IN VITRO* STUDY

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Aim: to evaluate the experimental safety and efficacy of a new piezoelectric tool for orthodontic clean-up after bracket removal.

Methods: a total of 45 teeth removed for orthodontic reasons were used in the present *in vitro* comparative study. The test-tool (Treatment 1) was matched with two other procedures: One step finisher and polisher (Inverted cone One gloss Shofu Dental, Kyoto, Japan) (Treatment 2) and twelve- fluted tungsten carbide bur (123-603-00, Dentaurum, Pforzheim, Germany) and Sof-Lex discs Pop-On XT Kit (3M ESPE) (Treatment 3), accounting for n:15 samples in each group. Clinical safety (enamel volume loss) and efficacy (residual adhesive volume) were measured with the use of Atos Compact Scan 3D structured light scanner (GOM GmbH) with the support of Atos Professional software. The enamel surfaces were scanned three times to evaluate: (i) residual adhesive volume (RAV) after bracket debonding; (ii) relative residual adhesive volume (dAV) after clean-up; (iii) enamel loss volume (EVL) at the end of the procedure.

Results: the distribution of mean RAV (mm 3) and the mean EVL (mm 3) resulted asymmetrical between groups. Moreover, the data do not reveal a statistically significant difference from normal distribution.

Conclusions: the instrument tested demonstrated to be effective and safe for cleaning after orthodontic treatment. Even for orthodontic treatment by means of clear aligners, the possibility of using an ergonomic and fast instrument can benefit both patient and practitioner.

BONE THICKNESS OF MANDIBULAR BUCCAL SHELF FOR MINISCREW INSERTION: LITERATURE REVIEW

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Aim: the objectives of this systematic review were to analyze the buccal bone thickness and bone depth of the mandibular buccal shelf (MBS) to determine the most suitable sites for miniscrew insertion.

Methods: electronic research was performed on PubMed database, using the PRISMA (Preferred Reporting Items for Systematic Reviews and meta-analysis) checklist. Keywords used were: “Buccal shelf AND miniscrew”. Articles from 2013 to 2023 have been considered.

Results and conclusions: 20 articles were found and 13 articles, that met the inclusion and exclusion criteria of the review, were selected. 12 studies agreed that the site of the MBS with the optimal anatomic characteristics was the distal root of the second molar, and one study claims that it is not the ideal site. The three scan planes have been refocused. The axial view has been reoriented to pass through the bifurcation point of first and second molar. In the axial plane, two points were identified at the mesial root of the mandibular first molar and the distal root of the second molar to reorient the sagittal scan plane. The coronal plane was reoriented in the direction of the coronal two-thirds of the mesial and distal roots of the first and second molars. The thickness of the cortical bone of distal root of the second molar it was typically greater than 6 mm from the amelocement junction and where the ideal bone depth is it is located 4 mm from the amelocement junction. The thickness of the buccal bone is instead usually thinnest at the level of the distal root of the mandibular first molar. No statistically significant differences according to gender were found for the characteristics of the buccal shelf. Three studies analyzed the influence of the divergence on the bone thickness for mini-screws insertion, however the results aren’t in agreement with each other.

CAN INTERPROXIMAL ENAMEL REDUCTION (IPR) INFLUENCE TEETH'S SUSCEPTIBILITY TO CARIES?

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Aim: the aim of this study was to investigate whether the interproximal enamel reduction was associated with an increased incidence of caries.

Methods: the search was conducted through the PubMed browser database using a combination of keywords: interproximal enamel reduction AND cavities OR caries OR complication, without time limits. The search produced 27 results, only 12 were selected for relevance to the topic.

Results: some studies found that different IPR instruments might produce enamel surfaces with different degrees of roughness, which in turn might influence its integrity and susceptibility to caries. Polishing after this procedure is thought to be helpful to reduce these adverse effects. However, the majority of studies agrees that the occurrence of caries on surfaces previously treated with IPR was the same as that on intact surfaces, indicating that IPR does not increase the risk of caries and demineralization on treated teeth.

Conclusions: after the analysis of the data from included studies, it was concluded that the IPR procedures could be useful in orthodontic clinical practice without negative effects. However, more randomized controlled clinical trials with a longer follow-up time and high-quality studies are required to confirm these assertions.

PROPOSAL OF RELIABLE AND REPRODUCIBLE MIDSAGITTAL REFERENCE PLANES IN 3D CEPHALOMETRY

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Aim: this preliminary study aims to identify in the literature the most reliable midsagittal plane in 3D cephalometry to evaluate alterations and asymmetries of the maxillofacial complex and to compare it with results from anthropometric analysis performed on stereophotogrammetry.

Methods: a PubMed literature review was conducted to find all the midsagittal planes proposed in 3D cephalometry from January 2000 to September 2022. The following keywords were used: "midsagittal plane and 3D cephalometry", "3D cephalometric landmarks", "3D cephalometry". The selected planes were then set up in a dedicated software (SimPlant O&O, Lueven, Belgium). A sample of patient (age 18-55y) with an angioCT taken between January 2019 and May 2022 was selected from the Neuroradiology Department database of the Maggiore Hospital in Parma, IT; only subjects whose CT scans did not show bone pathology of any kind were chosen. Using SimPlant O&O software, 3D skull reconstructions were obtained from angioCT and planes traced. Stereophotogrammetry was then performed on these subjects, using Polishape 3D scanner technology (Face Shape 3D MaxiLine, Bari, IT); anthropometric analysis was conducted on these shots by an expert operator. The results of 3D cephalometry were compared with those from the anthropometric analysis to determine which 3D plane was most reliable in identifying facial symmetry.

Results: currently, 24 of the 34 mediosagittal planes found in literature analysis have been used in the 3D cephalometric software.

Conclusions: the statistical data analysis phase is still in progress.

EFFECT OF WHITENING AGENTS ON ADHESION STRENGTH OF ORTHODONTIC BRACKETS: SYSTEMATIC REVIEW

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Aim: fixed orthodontic devices require the adhesion of brackets on dental enamel, therefore the effect that whitening agents could have on the orthodontic enamel-brackets interface should be investigated.
The purpose of this systematic review is to evaluate the effect of whitening agents on the adhesion strength (SBS) of orthodontic brackets.
Methods: the literature research was based on the keywords: “bleaching AND brackets AND adhesion” and was conducted using the following databases: PubMed, Scopus, Web of Science, Cochrane, Embase and Google Scholar. The protocol was registered and published at OSF (https://doi.org10.17605/OSF.IO/UY62C).
Results: the bibliographic research produced 8689 articles; according to the criteria of inclusion and exclusion only 11 scientific articles were selected. The SBS values were collected and analyzed using an universal mechanical testing machine. As a result, whitening treatment can worsen the adhesion of orthodontic brackets when these two procedures take place over a short period of time.
Conclusions: the adhesion of the brackets after whitening treatment must be postponed by 14 days; instead, the application of antioxidant agents after dental whitening could improve the SBS. In addition, other factors such as the chemical agents used in the treatment, the type of bracket and the adhesive system can affect the binding forces.

SOFT TISSUE NASAL CHANGES AFTER NASOALVEOLAR MOLDING: A LITERATURE REVIEW

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Aim: the recovery of nasolabial soft tissues in patients with CLP is mainly obtained through surgery. However, patients often have collapsed nares, flattening of the nasal tip, enlarged alar base, short and angled nasal columella towards the non-cleft side. Tissue remodeling by NAM treatment before cheiloplasty leads to a better postoperative outcome. The objective of the review is to evaluate the effect of NAM therapy before surgery. The evaluation of the soft tissue morphology is carried out through 3D stereophotogrammetry.
Methods: a research on PubMed was performed using the following keywords: “NAM” - “soft tissue” - “change”. The eligibility criteria were the type of study: Randomized Clinical Trials, Prospective Non-Randomized Controlled Studies and Controlled Clinical Trial, Systematic Review, Retrospective and Prospective Studies. The period of publication: after January 2013. Starting from 34 articles found, 6 were included in the Review.
Results: the 3D images of the craniofacial soft tissues, before and after NAM treatment, were measured using three-dimensional software. Significant changes were observed in nasal tip protrusion, columella length and width, and substantial modification in the position of subnasale and labius superius improved nasolabial symmetry.
Conclusions: the nasolabial shape is greatly improved by the combined treatment of NAM and surgical technique. There is a notable improvement in nasolabial anatomy after NAM, which further improves the results of primary reconstructive surgery.

ORTHODONTIC REPOSITIONING AFTER INTRUSIVE TRAUMA ON PERMANENT INCISORS: A SCOPING REVIEW

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Aim: intrusive luxation is defined as the displacement of the tooth apically into the alveolar bone due to a traumatic event and it is one of the most serious injuries of the periodontal ligament in dental traumatology; its prevalence is about 18-33% in permanent teeth. Aim of this review is to analyse available literature data to identify an accepted protocol for orthodontic treatment of intrusive luxations.

Methods: the research was conducted from September to November 2022 using Medline/PubMed, Scopus and Web of Science databases using proper keywords: dental traumatology; orthodontic splint; dental trauma; traumatic intrusion; intrusion injury.

Results: first screening of databases provided 236 articles, whom only 8 fully respected the inclusion criteria.

Therapeutic approach of immature apex is based on spontaneous re-eruption; the "watch and wait" choice in teeth with closed apices was used in a single case.

Orthodontic repositioning is an optimal treatment option when no evidence of re-eruption occurs in 3-9 weeks.

In 7 cases was used fixed multi bracket appliance; in only one case was sectional and bonded on the anterior incisors. At the end of active treatment the teeth returned in their original position with normal mobility and no sign of root resorption or periapical lesion. The follow up ranges from 30 months to 8 years.

Conclusions: orthodontic repositioning could be considered as a valide treatment option in >7 mm intrusion traumas involving permanent teeth with open and closed apex; currently a protocol about orthodontic repositioning is not proposed.

DECIDUOUS CANINE EXTRACTION IN INTERCEPTIVE THERAPY OF DISLOCATED CANINES: SCOPING REVIEW

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Aim: to analyze the effectiveness of deciduous canine extraction in mixed dentition in the presence of palatally displaced canines as an interceptive treatment to reduce permanent canine inclusion risk.

Methods: the search was set up following the PRISMA checklist. Different keywords were used (*palatally displaced canine*, *deciduous canine extraction*, *canine interceptive treatment*, *impacted canine)* on Medline, Pubmed, Google Scholar, the Cochrane Central Register of Controlled Trials and Scopus. There were included RCT with at least 12 months of observation after surgery, that analyzed patients in mixed dentition with the presence of unilateral or bilateral palatal dislocation of the permanent canine, that were focusing on the results of early extraction of the deciduous canine with no intervention or with the extraction of other deciduous elements and that reported clear results on the success rate of eruption of permanent canines.

Results: out of 1828 articles only 8 were included in the review providing data on the alpha angle change of the permanent canine and on the success rate of the permanent canine eruption.

The extraction of the deciduous canine represented a statistically significant benefit on the eruption of the permanent canine compared with no treatment; it did not produce any statistically significant results on the degree of the root resorption of adjacent elements.

Conclusions: early extraction of the deciduous canine may potentially increase the likelihood of successful eruption of palatally displaced permanent canine, even though more studies should be run.

THE NATURE AND ACCURACY OF INSTAGRAM POST CONCERNING OBSTRUCTIVE SLEEP APNEA

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Aim: to investigate origin and contents of Instagram posts as a source of information on obstructive sleep apnea (OSA).
Methods: using #sleepapnea the top 100 posts were collected from the "popular" tab.
Duplicates, irrelevant and non-English language posts were excluded. Posts were categorized in relation to account (health professional, academic, commercial, laypeople) and content type (personal experience, medical information, advertisements).
Accuracy was assessed based on the presence of claims regarding definition, symptoms, risk factors and management of OSA. A score from 0 to 3 was assigned for each category. All procedures were performed independently by 2 authors experienced in dental sleep medicine, with conflicts resolved by discussion.
Results: of the 45 posts included, most were health professionals (51%), followed by commercial (27%) and laypeople (22%). None were academics. Overall, 53% of posts promoted commercial products, followed by medical information (42%) and personal experiences (27%). Posts from laypeople reported more personal experiences compared with others ($p < 0.0001$); commercial posts promoted more products compared with laypeople ($p = 0.003$). Accuracy was poor: 10 posts were given a score of 0 and only 5 posts reached a score of 6 out of 12. Overall, symptoms and treatment were the most frequent themes (respectively, 44% and 36%).
Conclusions: the majority of Instagram posts fail to or do not properly address the most important aspects of OSA. Given the easy access to social media, efforts should be made to promote more accurate information.

ACCURACY OF EXPANSION WITH CLEAR ALIGNERS

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Aim: to assess the predictability of expansion with clear aligners, evaluating the upper and lower arch dentoalveolar transverse changes and the variations of the upper first molar inclination.
Methods: pre-treatment (T_0), virtual plan (T_1), and post-treatment (T_2) digital models of 39 dental arches (19 maxillary and 19 mandibular) were uploaded on a 3D metrology software (Geomagic Control X). Digital models were superimposed and buccal cusps tips and centres of gingival margins, were selected as landmarks to measure the transverse diameters of upper and lower canines, premolars, and first molars. The angle formed by the intersection of the vectors projected onto the coronal plane and passing through the distobuccal and mesiolingual cusps of both maxillary first molars was measured to determinate molar inclination. Molar inclination and transverse diameters (on both gingival and cusp sides) were analysed by assessing the Prescription (planned movement, T_1-T_0), the Achieved movement (T_2-T_0), the Accuracy as the amount of movement that clinically occurred compared with the movement planned in virtual plan, expressed in percentage (T_2-T_0)/(T_1-T_0) %.
Results: mean upper arch accuracy for expansion was 65% (71% at cusps and 60% at gingival), and 63% for the lower arch (67% at cusps and 59% at gingival). An accuracy of 40% was reported for molar inclination.
Conclusions: aligners do not achieve 100% of the prescription; thus, constant monitoring and an overcorrection of the expansion might be recommended.

RADIOGRAPHIC EVALUATION OF MANDIBULAR ASYMMETRY IN TWINS WITH III SKELETAL CLASS

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Aim: this study aims to evaluate mandibular deviation or asimmetries in couples of twins who have a skeletal III class through measurements made on frontal telecranium in postero-anterior projection.

Methods: twins with skeletal III class were selected because literature reports that patients with skeletal III class are more predisposed to mandibular asimmetry. Frontal telecranium in postero-anterior projection of 4 couples of twins were analyzed thanks to the permission of AAOF Craniofacial Growth Legacy Collection and Forsyth Institute. RX were all taken before the beginning of an orthodontic treatment. Measurements used were: distance between GA, AG and PM; GA/AG ratio; distance between GA and AG's perpendicular projections on MP (Mid-plane).

Results: 3 of the 4 couples analyzed had a GA/AG ratio less than 1, so there was a left transverse deviation. The other couple instead had a GA/AG ratio higher than 1, so a right transverse deviation. Every twin in each couple had a deviation on the same side (left or right). 3 of the 4 couples presented a normal range of vertical asymmetry (0+/-2 mm). The other couple had higher asymmetry respectively of 10 and 5 mm, both of them on the left.

Conclusions: despite a poor sample, all couples of twins had concordant transversal and vertical asymmetries. Other studies should be taken to validate this analysis.

PREDICTABILITY OF ALIGNERS IN DENTOALVEOLAR TRANSVERSE CHANGES: A RETROSPECTIVE STUDY

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Aim: this work aimed to compare the cross-sectional measurements of Nuvola simulation software with the final clinical result and evaluate the degree of dentoalveolar expansion achieved with Nuvola aligners on the maxillary arch.

Methods: this study retrospectively observed a sample group of 35 patients who underwent orthodontic treatment with clear aligners. A comparison between actual outcomes and planned treatment final position was made. The sample was divided into groups: group A, composed of 10 patients, and group B, consisting of 25 patients. Each model was provided at t_0 (pre-treatment), t_1 (post-treatment), and final digital setup (s1). Group A was treated with 12 aligners, while group B was treated with 24. Using a digital calliper researchers recorded the linear values of the widths of the jaw arches considering the tips of the cusps and the most palatal points of the gingival margin of the canines, premolars, and first molars.

Results: with reasonable doubt, the aligner treatment in group A (12) and group B (24) shows a good degree of adherence to the prescription, especially in the dental tip measures. On the other hand, the gingival measures show a higher degree of bias, and the differences were statistically significant. The effects, however, did not differ between the two groups (12 *vs* 24).

Conclusions: the evaluated aligners had proven useful, within certain limits, in determining the predicted movements in the transverse plane especially considering movements related to the vestibular-palatal inclination of the dental elements.

DISCREPANCY EVALUATION BETWEEN THE PLANNED AND FINAL INSERTION AXIS OF MINISCREWS

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Aim: the purpose of this study was to evaluate the accuracy of surgical guides obtained by 3D printing process, considering the digitally planned position and comparing this one to the axis of final orthodontic miniscrews.

Methods: 24 subjects were included with permanent dentition. It has been performed a preliminary CBCT examination to plan the insertion of miniscrews in the anterior palatine vault. Once inserted, the specific scanbodies were coupled with the miniscrews and their position were registered by performing a new intra-oral scan. The scan with scanbodies was superimposed, using EXOCAD Software (Exocad DentalCAD, exocad Gmgh Darmstadt, Germany) to the virtual analogues of miniscrew planned in the digital project. BluSkyPlan Software (Blue Sky Plan software version 4.7, Blue Sky Bio, LLC, Grayslake, IL, USA) was used to identify the maximum discrepancy between the planned and final miniscrew placement. The maximum insertion angle discrepancy and the maximum linear difference between the head and tip of the miniscrew were measured on the model with the planned miniscrew position superimposed to the model with final placed miniscrew.

Results: descriptive and inferential Statistics was performed. On average, there was a discrepancy between the planned insertion axis and the final insertion axis of 2,95 ° (SD +/- 1.13 °), with 10 mm miniscrew lenght.

Conclusions: digital planning for surgical guided miniscrew insertion has been shown to be reliable. However, 4.5° of discrepancy can cause clinically significant alterations at the apex between the planned position on the CBCT of the orthodontic miniscrew and the final clinical position.

CONDYLE CHANGES AFTER TREATMENT OF FUNCTIONAL POSTERIOR CROSSBITE: A CBCT STUDY

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Aim: to evaluate the morphological changes of mandibular condyle after miniscrews-assisted rapid palatal expansion (MARPE) in subjects affected by functional posterior crossbite FPXB.

Methods: the sample consisted of 20 adolescents with FPXB (10 boys, 10 girls) with a mean age of 13.8±1.1 years. The scans were taken CBCT before and after MARPE immediately. A specific 3D imaging technology was used to perform, firstly, semi-automatic segmentation of the condyles (Mimics software), and, secondly, digital registration between pre-treatment and post-treatment condyle (Geomagic software). Volumetric analysis and surface-to-surface analysis was performed to evaluate post-treatment changes. All data were statistically analyzed.

Results: significant differences were found in the condylar volume between both sides, with the volume at the CB side being smaller than non-CB side ($p > 0.05$). No significant difference in condylar volume were found between T_0 and T_1 at both sides ($p > 0.05$).

The deviation analyses showed no difference in the morphology of the condyle surface between pre-treatment and post-treatment condition.

Conclusions: within the limitation of this retrospective study, clinicians should not expect a significant morphological change of the condyles after treatment of FPXB with RME in youngsters.

CEPHALOMETRIC ASSASSMENT IN CLASS III MALOCCLUSION TREATMENT

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Aim: to validate the predictive model using the CondAx-MP variable proposed by Franchi and Bacetti to predict the long-term stability of early treatment with rapid maxillary expansion (RME) and facial mask (FM) in a sample of growing Class III patients.

Methods: the study was carried out between November 2020 and March 2021, examining the cephalometric records of 24 patients at the dental Clinic of Policlinic of Bari. From the inizial sample, 13 patients passed the selection criteria. Cephalometric surveys were performed at T_0 (before treatment) and T_1 (long-term follow-up). The mean age at T_0 was 7.1±1.6 years, while the mean age at T1 was 20±3.2 years after pubertal growth. The average period of active treatment was 1 year, characterized by the application of a palatal expander associated with Delaire mask traction. The angle examined in the predictive study was the CondAx -MP angle.

Results: of the 13 patients, 9 (69%) responded successfully and had a CondAx-MP angle of 147.8° below the critical value. 4 patients (31%) had a poor prognosis, specifically, 3 patients had an angle value greater than the critical value of 147.8° and thus concordant with the study, only one had a value of 145°, discordant with the angle examined.

Conclusions: the major variable determining the failure of early orthopedic treatment is the amount and direction of vertical growth understood as the post-rotation of the mandible during and after adolescence. The CondAx-MP variable is useful in predicting early treatment failure of the third skeletal classes.

RAPID PALATAL EXPANSION AND PEDIATRIC OSA: A CASE-CONTROL STUDY

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Aim: this study aims to compare respiratory parameters of patients undergoing rapid palatal expansion (RPE) positive and negative for OSAS.

Methods: 41 patients with maxillary transverse deficiency (22 M, 19 F, age 6-12) underwent to a first Home Respiratory Polygraphy (HRP) for two consecutive nights.
Their caregivers were asked to answer the PSQ to assess the risk for OSA. After the active phase of treatment, 31 of the 41 children underwent a second HRP. 12 months after the treatment, patients suffering from OSA underwent to a third follow up HRP.

Results: the initial HRP evidenced 11 patients with AHI >1. 14 initial PSQ resulted positive for OSA risk whereas after RPE treatment only 8 patients reported positive questionnaire. Out of 11 patients 7 manifested improvement in AHI after RPE while only one showed an increase of AHI due to weight gain.
The control group maintained normal respiratory parameters except for 5 children who recorded a slight worsening of the AHI.

Conclusions: this study showed the improvement in respiratory parameters in most of the OSA patients after RPE.
The control group maintained comparable values, with a slight worsening in some patients.

ORTHODONTIC APPLIANCES FOR OSA: A LITERATURE REVIEW OF EFFECTIVENESS AND COMPLICATION

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Aim: the aim of this review is to evaluate the effectiveness of different orthodontic appliances, with particular attention on the MAD appliance and Klearway appliance in treating OSA.

Methods: a systematic search was conducted on the PubMed database using the keyword "Orthodontic appliances OSA". The author considered articles published until 2015 and only referred to humans. The eligibility criteria were the type of study: Randomized clinical trials, prospective non-randomized controlled studies and controlled clinical trials, systematic review, retrospective and prospective studies. Of the 202 articles only 12 articles were selected from the review process.

Results: MAD and KW appliances were found to be effective in reducing the apnea-hypopnea index (AHI), and snoring frequency, and improving the quality of the patient's life, with minor side effects that improved over time. However, there were differences between the two types of appliances in terms of retention and construction methods, material flexibility, adjustability, freedom of jaw movement, and quantity of mandibular protrusion.

Conclusions: MAS and the KW appliance are effective in treating OSA, but their effectiveness and advantages may vary depending on the specific patient and the severity of their condition.

The KW appliance is particularly effective in reducing high apneic events during sleep and improving upper airway obstruction in the supine position. Clinicians should consider patient characteristics and condition severity when selecting the most appropriate appliance for OSA treatment.

CORRECTION OF A SKELETAL CLASS II MALOCCLUSION USING FORSUS APPLIANCE

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Aim: the purpose of this case report is to describe the management of the Forsus Appliance to correct a skeletal class II in an uncooperative patient.

Methods: 11.5-year-old female patient. Profile analysis shows a slightly open nasolabial angle, a tendentially convex profile with retroposition of the mandible. The intraoral examination allows us to appreciate the retroinclination of the upper incisors and the presence of a dental class II full right and left with deep bite. Cephalometric analysis confirms the presence of a skeletal class II (Wits Index = 3) from mandibular retrusion (SNA = 79°; SNB = 74°; ANB = 5°) in a normo-divergent patient. As the patient was still in the growth phase, the treatment plan included the use of a Forsus appliance during treatment with fixed straight-wire appliance. Since the lower incisors are correctly inclined relative to the mandibular plane (value of 95°), the undesirable mesializing effect of the Forsus appliance was managed clinically.

Results: as a result of overlapping cephalometric tracings, both skeletal and esthetic improvement was observed.

Conclusions: the Forsus Appliance, therefore, is an effective alternative in the treatment of moderate Class II skeletal malocclusions in uncooperative patients.

ORTHODONTIC MANAGEMENT OF IMPACTED TOOTH DUE TO THE PRESENCE OF SUPERNUMERARY: CASE REPORT

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Aim: pediatric dentists often have to handle with challenging situations during dental occlusion development, including deviations from the normal eruption sequence. Supernumerary elements are the main cause of delayed maxillary incisors eruption. This case report wants to show how early diagnosis of these conditions can led to less invasive management of included teeth.

Methods: in 2018, an 8-year-old male patient came to our observation.

Radiographically, element 12 was observed to be retained and obstructed in its eruptive pathway by the presence of a supernumerary element that was extracted.

After nearly 24 months of waiting, in the absence of spontaneous eruption of the element, we decided for the aid of a rapid palate expander (RPE) with bands on the sixths and fourths.

Results: after 20 RPE activations, 12 began to be palpable. After a total of 32 activations, the element was close to permutation, opting for the end of activations.

The intraoral radiography showed 12 erupting, although the apex was not clearly visible. At 10 months from the beginning of therapy, 12 was erupted in the arch.

Conclusions: management of an impacted tooth can be complex and often requires a collaborative approach among multiple dental specialties.

It is crucial having the skills to diagnose and to identify impacted teeth in the early stages in order to make the management of these cases less invasive, achieving the correct position of an element by taking advantage from the action of devices, such as RPE, also aimed at correcting co-present skeletal discrepancies.

ADOLESCENT PATIENT WITH 1.3 AND 4.3 CROSSBITE

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Aim: the aim of this case report is to consider the results achieved with a treatment of fixed orthodontics in an adolescent patient.

Methods: the patient is a 16-year-old girl, with permanent dentition. A study of the case was carried out with the collection of dental objective examination, Rx opt, lateral teleradiography, posteroanterior teleradiography, cephalometry, photos and impressions. It was obtained the diagnosis of dental skeletal class I, mesodivergence, dental deep bite, right lateral deviation, 1.3 and 4.3 in crossbite, superior and inferior dental crowding. A fixed orthodontic therapy was performed for management of this patient case.

Results: the orthodontic fixed therapy has been scheduled for 18 months. At the end of the treatment the problems above mentioned were resolved. A lower fixed retainer and a superior essix were used.

Conclusions: in conclusion, fixed orthodontic treatment can give excellent results for alignment and control of occlusal plane.

CLASS II LEFT SUBDIVISION IN ADULT PATIENT TREATED WITH INVISALIGN

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Aim: demonstrate the effectiveness of Invisalign® aligners in resolving a left subdivision Class II malocclusion with scissor bite, unilateral crossbite, strong tooth inclinations, moderate crowding, and deviated midlines.

Methods: patient female 27 years old. Frontal aesthetic analysis of the face at rest showed a mild increase of lower third compared to the middle and upper third. The analysis of the profile showed a normal profile. Second class left molar and canine and first class molar and canine with open bite tendency. Cross bite between elements 2.4 and 3.4 and a right unilateral scissor bite on 3.5. The lower arch showed moderate crowding and a rather irregular arch and elements 3.4 and 3.5 with a very unfavorable root torque. The patient underwent Invisalign® aligners treatment for approximately 18 months, consisting of a main phase of 34 weeks, 2 terminal refinement stages of 14 weeks and 10 weeks. During the treatment an interproximal reduction (IPR) was also carried out to allow the alignment of crowded elements. The aligners were worn carefully and constantly for 22 hours a day and changed after a week.

Results and conclusions: the dentoalveolar expansion was achieved with right unilateral cross bite and scissor bite correction, anterior crowding resolution, rotation corrections, and parabolic arch shape. The correction of the shape of the lower arch and of the root torque of the elements led to the resolution of the occlusal interferences allowing the resolution of the malocclusion and therefore the re-centering of the midlines. Furthermore, the aligners have made it possible to obtain a correct smile line, a greater fullness of the buccal corridors and an overall winning aesthetic result.

SPINAL FLEXION AFTER FUNCTIONAL THERAPY IN UNILATERAL POSTERIOR CROSSBITE

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Aim: to investigate the effect of functional treatment with the removable appliance Function Generating Bite (FGB) on spinal flexion in unilateral posterior crossbite (UPC) patients.

Methods: 38 Patients with UPC (M = 17, F = 21, mean age ± SD 8.6±1.7 [yr.mo]) and 35 control patients with normal occlusion (M = 19, F = 16, mean age ± SD 11.3±2.4 [yr.mo]) underwent spine alignment evaluation with the electronic inclinometer Spinal Mouse® system (Idiag AG, Switzerland) before the beginning of treatment (T_0), and after the correction of the malocclusion (T_1).

UPC was treated with FGB, manufactured with acrylic resin, expansion springs, and resilient, stainless steel posterior bites that prevent occlusal contacts between opposing teeth during swallowing.

Results: UPC was corrected in all patients (n = 38). The mean time between the spine alignment evaluations (T_0/T_1) was 1.8±1.7 [yr.mo] in UPC and 0.8±0.6 [yr.mo] in the control group. The pre-treatment (T_0) left and right flexion angles showed a significant difference in the UPC group ($p < 0.001$), with the crossbite side being more flexible compared to the non-crossbite side. After treatment with FGB (T_1), there was no difference between the left and right sides ($p = 0.44$ and $p = 0.15$, respectively) in UPC patients. No difference between the sides was observed in the control group at T_0 and T_1.

Conclusions: UPC in growing patients is associated with asymmetrical flexion of the spine. Functional treatment with FGB effectively treated the malocclusion and re-balanced spinal flexibility between the sides.

CONDYLAR ASYMMETRY IN CHILDREN WITH UNILATERAL POSTERIOR CROSSBITE MALOCCLUSION

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Aim: Unilateral posterior crossbite (UPC) is a common, severely asymmetric malocclusion characterized by maxillary hypoplasia and masticatory dysfunction. This research aims to evaluate the asymmetry of mandibular condyles and rami in orthopantomograms (OPG) of children with UPC.

Methods: this study included 33 children with UPC (F = 15, M = 18; mean age ± SD = 8.0±1.3 [yr.mo]) and 33 age- and gender-matched controls (F = 15, M = 18; mean age ± SD = 8.4±1.3 [yr.mo]. A line tangent to the most lateral points of the ramus and condyle (V) was traced on pre-treatment OPGs, followed by 3 perpendicular lines: one tangent to the highest point of the condyle (H1); one intersecting line V at the most lateral point of the condyle (H2); one intersecting V at the most lateral point of the ramus (H3). The distances H1/H2 (height of the condyle) and H2/H3 (height of the ramus) on each side were measured with digital calipers. The asymmetry index between the right (R) and left (L) sides was calculated with the formula |(R-L)/(R+L)|x100; asymmetry was considered present for values >6%.

Results: UPC showed a significantly increased asymmetry of mandibular left and right condyles (mean ± SD = 10.7% ±9, p <0.001) but not of rami (mean ± SD = 1.9% ±2.3), compared to control, who showed symmetrical condyles and rami.

Conclusions: the presence of an increased condylar asymmetry index in a developing patient with unilateral posterior crossbite is a sign of altered skeletal growth: it should be considered in the diagnostic process and treatment plan.

CARRIER MOTION *VS* SEQUENTIAL DISTALIZATION WITH CLEAR ALIGNERS IN CLASS II TREATMENTS

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Aim: to compare the type and entity of tooth movement of the maxillary arch obtained with clear aligners alone (CA) or with aligners in combination with Carrier Motion 3DTM (CM), in post-peak pubertal patients presenting class II malocclusion.

Methods: 2 groups of patients were analyzed: CA group (6 M and 7 F, 18 mean age +/- 5 yo) was treated exclusively with aligners, CM group was treated with Class II Carriere Motion 3DTM and aligners in the lower arch (4 M and 4 F, mean age 15 +/- 2 yo). The following inclusion criteria were observed: class II malocclusion with non extractive treatment plan; vertebral stage higher than CS3 and the visibility of rugae and palatine vault on digital models.

The *software* Geomagic Control X (version 2020.1.1, ©2020 3D Systems, Inc.) and Viewbox 4 (version 4.1.0.1 BETA, dHAL Software, Kifissia, Greece) were used to make the required overlaps and measurements.

Results: the following statistically significant results were found:

1. greater sagittal movement of molars in CA group.
2. Increased coronal-palatal retraction and loss of torque of the central incisors in the CA group.
3. Distal tipping of central incisors and vertical movement of canines were greater in CM group. In addition, intrusive movement was detected in the CA group canines.

Conclusions: class II sagittal relationship correction was achieved in both groups analyzed. Distalisation of the 1st molar was greater with clear aligners, but careful control of anterior tooth movement design is necessary to avoid unwanted movement.

FAILED RESTORATIONS IN ORTHO-TREATED PATIENTS: CORRELATION BETWEEN FUNCTION AND FRACTURES

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Aim: the possible influence of bruxism on the fracture of direct additive restorations was investigated in the present study, placing as a null hypothesis the inability of bruxism to condition them.

Methods: 12 comparable patients which were submitted to an ortho-resto treatment more than 5 years ago were recruited.

Of these patients, 6 had fractured restorations (group 1) while the other 6 had intact restorations (group 2). To all patients the muscular activity was measured with BruxOff device, while a Brux-Checker was performed to evaluate mandibular dynamic movements during night.

Finally, replica models of the composite restorations were performed and analyzed through SEM.

Results: BruxOff recordings showed that Group 1 had more marked activity of the masseter muscles than Group 2. In particular, between the two groups, the following variables were statistically significant: phasic contractions ($p = 0.003$), tonic contractions ($p = 0.003$), mixed contractions ($p = 0.002$), heart rate ($p = 0.027$) and total masseter contractions ($p = 0.0001$). Brux-Checker and SEM failure analysis underlines how fractured surfaces have steps resulting from the propagation of the initial crack through the adhesive interface.

Conclusions: given that there are no other studies in the literature investigating the correlation between bruxism and fracture of direct additive restorations and given that the sample analyzed is small, further studies would be needed to confirm the results of this study.

OCCLUSAL CONTACTS REGISTERED WITH INTRAORAL DIGITAL SCANNER AND ARTICULATING PAPER

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Aim: the recording of the occlusal contacts is a pivotal step of many dental procedures, yet the lack of a standardized method could introduce clinical errors. The introduction of digital impressions has provided an alternative method for the recording of occlusal contacts, although the precision of this technique when scanning a complete dental arch is still not clearly established. The aim of this study was to compare the occlusal contacts recorded with a digital intraoral scan to the contacts registered with articulating paper.

Methods: thirty adult patients were enrolled for this study. Digital impressions and intraoral photos of the colored marks impressed by articulating paper were both taken at the same time point for every patient.

Using a standardized occlusal template, two operators recorded the number of occlusal contacts for every tooth provided by the two techniques. Statistical analysis was used to compare the number of occlusal contacts recorded with digital scans versus articulating paper.

Results: the statistical analysis showed that there were significant differences between the number of contacts reported by digital impressions and the ones reported by the photographed articulation marks, except for upper central incisors and first premolars.

Conclusions: there is not a match between the occlusal contacts taken with the intraoral scanner and the one taken with the articulating paper.

INFLUENCE OF CLEAR ALIGNER TREATMENT (CAT) ON PERIODONTAL AND MICROBIOLOGICAL PARAMETERS

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Aim: clear aligner treatment (CAT) shows less plaque accumulation and periodontal risk compared to fixed orthodontic treatment.

This study aimed to evaluate changes induced by CAT after 2 months on periodontal status and oral microbiological composition by CAT compared to orthodontically untreated people within 2 months.

Methods: 40 patients were recruited considering the following inclusion criteria: age >12 years, good periodontal health, skeletal and molar class I, dental malocclusion, no periodontal treatment.

Patients underwent professional oral hygiene and after 14 days were recalled (t_0) to evaluate PPD, BOP, PI and to perform microbiological tests; they were divided into Group 1 (20 orthodontic patients) and Group 2 (20 untreated patients).

After 2 months (t_1) the same assessment was repeated.

Data underwent statistical analysis with significance at $p < 0.05$.

Results: no significant differences were found between the two groups neither for PPD, PI or BOP, nor for the specific bacteria strains expressed in copies/ml or as a percentage ($p > 0.05$).

The only increase in total bacterial count from t_0 to t_1 resulted significantly different in both groups ($p < 0.05$), but this parameter includes common oral microbiota bacteria, therefore not representing a clinically significant result.

Conclusions: CAT is a valid treatment as it does not significantly influence periodontal and microbiological parameters for the first 2 months of therapy.

Studies with longer follow-up and considering further laboratory parameters are needed to confirm the findings of the present study.

THE CARRIERE MOTION APPLIANCE FOR THE CORRECTION OF CLASS II MALOCCLUSION

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Aim: to evaluate dental and skeletal changes produced by the Class II Carriere Motion appliance, in growing patients with Class II malocclusion, through cephalometric analysis.

Methods: the sample included 13 subjects, aged between 9 and 13 years, with Class II malocclusion. Patients were treated with the Class II Carriere Motion appliance. Cephalometric tracings were performed at the beginning and at the end of treatment. Comparison was performed using the paired Student's t-test. P values <0.05 were considered statistically significant.

Results: in terms of skeletal changes, SNA remained stationary ($p = 0,98$) and SNB increased slightly ($p = 0,001$); there was a mandibular advancement, probably due to the removal of occlusal interferences. ANB and Wits decreased (respectively $p = 0,012$ and $p = 0,000$). No statistically significant changes were found in the inclination of the bispinal plane ($p = 0,39$), the occlusal plane ($p = 0,79$) and the mandibular plane ($p = 0,70$). Therefore, the lower Essix retainer is an effective tool in controlling the divergence.

In terms of dental changes, a statistically significant change was found in the proclination of the lower incisors ($p = 0,018$) and in the distalization of the maxillary molars ($p = 0,048$) but not in the proclination of the upper incisors ($p = 0,19$).

Conclusions: the results of this study have shown that the Carriere Motion Appliance is an effective method for distalizing maxillary molars. Dental effects, produced by this appliance, were more significant than skeletal effects. The compliance of growing patients was high.

UPPER CENTRAL INCISORS INCLUDED: LITERATURE REVIEW AND THERAPEUTIC STRATEGIES

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Dental impaction represents a significant challenge. It occurs when a dental element has been absent in the arch for more than 6 months compared to the physiological eruption and affects about 6% of the population if wisdom teeth are excluded. Among the causes there are systemic factors (drugs or pathologies that alter bone density, genetic alterations) and local factors (trauma, supernumeraries, neoformations, early loss of the deciduous tooth). Inclusions are classified according to the type of obstruction and position of the tooth: I incisors with buccal impaction; II palatal impacting incisors; III vertically impacting incisors. The only surgical removal of the obstruction to the eruption often allows the eruption of the retained tooth in 12-36 months in 65% of cases without orthodontic traction. The surgical orthodontic approach with traction is the most used: exposure to a cold blade is the most used, although the use of the diode laser is widespread (it reduces bleeding, the intake of painkillers and healing times; it has a biostimulant). The orthodontic traction is performed with: continuous arch, double arch system (piggy back), auxiliaries linked to a continuous arch, levers, equipment created in the laboratory and, recently, miniscrews, which reduce the orthodontic counter-effects. The literature shows that an approach to the inclusion of incisors must be as swift as possible: the surgical orthodontic approach with laser and the biomechanical approach with miniscrews are the best, fastest and safest system for the patient and the operator.

BIOMECHANICAL STRATEGIES FOR THE RESOLUTION OF SECOND CLASSES DIVISIONS 2

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Aim: class II Division 2 malocclusion is characterized by retroclination of the upper central incisors and severe overbite and has a reported prevalence of 7%-8% in Italy.
The aim of the study is to analyze the biomechanical strategies for the resolution of this malocclusion, respecting the final aesthetic result of the smile.
Methods: the inclusion criteria are malocclusions of class 2 division. All cases were treated with different biomechanical strategies, specific to each patient.
The first biomechanical step is to transform the malocclusion in division I by aligning the central incisors to the lateral incisors usually in an adequate position to favor a mandibular unlocking. In this way the anterior repositioning of the jaw is favored, with an initial correction of the class ratio.
Results: the cases ended in overlapping times, with the achievement of class I molar and canine on the right and left SIDE, normalized overjet and overbite, coincidence of the dental medians. In addition to the following objectives, special attention was given to the final exposure of the patients' smile.
Conclusions: since there is no single line of treatment of the second classes division 2, the most effective biomechanical strategy for the individual patient must be guided by the experience of the clinician, who will protect the final result from a functional and aesthetic point of view.

GERMECTOMY OF THE THIRD MOLAR IN ORTHODONTICS: A REVIEW OF THE LITERATURE

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Aim: germectomy is a surgical treatment defined as the removal of a tooth at the beginning of its development, when it has no contacts with the surrounding anatomical structures. The aim of the work is to present an international literature review to offer an overview on indications and ideal timing for this practice.

Methods: a literature review has been done on PubMed database [www.ncbi.nim.nih.gov/pubmed] looking for the articles dealing with indications, contraindications and discussions about this technique. Among the articles found, those ones published between 2013 and 2023 were selected.

Results: germectomy is a convenient, rapid, atraumatic technique without important post-surgical side effects. It's executable in local anesthesia and it's much less invasive than the traditional surgery of the third molar: for this reason a lot of authors are favorable to this practice.

Among the authors, the debate about the ideal timing to operate is still open.

Conclusions: despite the conflicting opinions found in the literature, it's univocally recognized the importance of a careful evaluation of each single patient, in order to establish/decide the real need of germectomy and the right period to operate.

THE ROLE OF ORTHODONTIST IN JUVENILE IDIOPATHIC ARTHRITIS

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Aim: Juvenile idiopathic arthritis (JIA) is the most common inflammatory rheumatic disease of childhood. The temporomandibular joint (TMJ) is one of the most frequently involved joints. When TMJs are affected, patients may present with pain at joint and masticatory muscles, and dysfunction with crepitus and limited jaw movement.

Moreover, TMJ arthritis affects mandibular growth, resulting in skeletal deformity (convex profile and facial asymmetry), and malocclusion. The aim of this review is to describe the role of the orthodontists in the management of patient with JIA and TMJ involvement.

Methods: this is an overview of evidence for the diagnosis and treatment of patients with JIA and TMJ involvement.

Results: orthodontists should be able to identify TMJ involvement by screening for orofacial manifestation of JIA. The treatment protocol of JIA with TMJ involvement requires an interdisciplinary collaboration between rheumatologist, radiologist and orthodontist. Orthopedic/orthodontic treatment and surgical interventions for the management of growth disturbances are recommended. Orthodontists are also involved in the management of orofacial signs and symptoms: the treatment protocol suggested includes behavioral therapy, physiotherapy, and occlusal splints.

Conclusions: since disorders of mandibular growth often appear during childhood, the orthodontist could be the first clinician to see the patient and can play a crucial role in the diagnosis and management of JIA patients with TMJ involvement.

NOONAN SYNDROME: CRANIOFACIAL AND DENTAL ANOMALIES

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Aim: Noonan syndrome (NS) is a multisystem disorder featuring unusual face, multiple malformations and congenital heart defects as Noonan and Ehmke described firstly.

Frequent craniofacial abnormalities are: high forehead, small and triangular face, large skull with narrowing at the temples and hypertelorism. These features usually occur with occlusal disorders, it can cause feeding difficulties and, if it's added to swallowing and digestive problems, frequent vomiting and decreased appetite, can cause a growth delay, which requires a multidisciplinary team help. It is vital, therefore, that doctors recognize clinical conditions of NS in order to accelerate diagnosis time and improve the clinical management of these patients.

Methods: a narrative revision of the literature was conducted using the PubMed and Google Scholar databases. Keywords: Noonan syndrome, dental, facial and orthodontics features, dental issues.

Results: the main occlusal disorders in NS are ogival palate, dental malocclusion, joint difficulties and micrognathia.

Other oral signs are periodontal problems, delayed eruption, agenesis, impacted teeth, hypodontics, taurodontism, macrodontia and giant cell mandibular lesions.

Conclusions: craniodental-facial anomalies can be related to important aesthetic and functional consequences, interfering with normal feeding and growth. According to systemic problems usually associated with NS, careful evaluation of craniodental-facial abnormalities and treatment planning by an appropriate multidisciplinary team can help to improve the quality of these patients' lives.

IN VIVO EFFECTIVENESS OF 3D-PRINTED TRANSFER TRAYS FOR INDIRECT BRACKET POSITIONING

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Aim: to assess *in vivo* the effectiveness of digital customized transfer trays for indirect bracket positioning.

Methods: the search for articles was carried out in PubMed, Scopus, Web of Knowledge and Google Scholar including articles published in English until December 2022.

The search identified every human study report potentially relevant to the review, applying a specific search strategy for each database.

After duplicate study selection and data extraction procedures according to the PICOS scheme, the methodological quality of the included papers was assessed by the Swedish Council on Technology Assessment in Health Care Criteria for Grading Assessed Studies (SBU) method.

Results: the initial search identified 126 articles, 43 of which were selected by title and abstract. After full-text reading, 3 papers were selected. The evidence quality for the selected studies was moderate.

Conclusions: the 3D-printed transfer trays have a transfer effectiveness which is clinically acceptable according to the American Board of Orthodontics (ABO), except in the vestibular-lingual direction. Therefore, Hence, 3D-printed transfer trays may be considered accurate for the *in vivo* indirect bracket positioning.

CHEWING PATTERNS AND MUSCULAR ACTIVATION BEFORE AND AFTER FUNCTIONAL THERAPY OF DEEP BITE

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Aim: deep bite, a frequent malocclusion with a tendency to relapse, is associated with craniofacial features that need to be considered during orthodontic treatment. This study evaluates the masticatory patterns and muscular activation in deep bite patients before and after functional therapy with Function Generating Bite (FGB).

Methods: this study included 81 patients with deep bite malocclusion (11,4±1,1 [yr.mo]; M = 32 F = 49) and 14 age- and gender-matched controls (9,11±1 [yr.mo]; M = 5; F = 9). Patients with deep bite malocclusion received functional treatment with FGB (n = 25). Chewing cycles and masticatory muscle EMG activity were recorded concomitantly before treatment in both groups (n = 95). Following the malocclusion correction, a second recording occurred (n = 25).

Results: kinematic variables showed the same dependency on bolus hardness in those with deep bite and in controls ($p < 0.001$). Masticatory muscle EMG activity was increased in those with deep bite and decreased as a result of functional treatment ($p < 0.05$). In addition, chewing patterns showed a tendency towards a reduced lateral component, which significantly increased after treatment ($p < 0.01$), indicating that functional therapy impacts neuromuscular coordination of mastication as well as dental positioning.

Conclusions: deep bite is a complex malocclusion involving chewing and masticatory muscle activity alterations. Considering the results of this study, orthognathodontic treatment of this malocclusion should consider and correct not only teeth position but address muscular hyperactivity.

EFFECTS OF MAXILLARY EXPANSION IN IMPROVING SAGITTAL PARAMETERS OF CLASS II MALOCCLUSION

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Aim: the present systematic review aimed to assess the effectiveness of maxillary expansion (ME) in improving sagittal dental and skeletal parameters in growing patients with Class II malocclusion.

Methods: relevant literature published in English without date restrictions was searched across Cochrane Library, Scopus and MEDLINE/PubMed databases, using the keywords: palatal expansion OR maxillary expansion AND Class II. Changes in SNA, SNB, ANB, 6/6 molar relationship, OVJ were analyzed. The risk of bias of nonrandomized and randomized studies were assessed through MINORS and Rob2 tools, respectively. A narrative synthesis of results was performed.

Results: the selection process brought 10 studies, including 745 growing patients, characterized as having either Class II dental malocclusion or skeletal discrepancy. Patients 546 received ME treatment, and 199 were untreated. Changes in 6/6 molar relationship (-1.44 mm), SNB° (from +1.24° to +2.25°), and ANB° (from -1.36° to -2.03°) were reported after ME. Moreover, when assessing treatment effect in relation to control, significant improvement were found in 6/6 molar relationship, OVJ, and ANB°. However, only two studies were randomized clinical trials with potential evidence quality. Remaining non-randomized clinical trials included presented several inadequacies related to control groups and lacked of adequate statistical analysis.

Conclusions: our results pointed out the need for better planned studies in order to confirm the effectiveness of ME treatment in improving sagittal parameters of Class II malocclusion.

PALATAL EXPANSION IN LABIO-PALATAL CLEFT PATIENTS: A SCOPING REVIEW

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Aim: the purpose of this study is to provide, through a literature review, an overview of the orthodontic treatment in cleft lip and palate and to examine the dentoalveolar outcomes of palatal expansion in patients with cleft lip and palate; obtained with different devices orthodontics. The hypothesis is that the dentoalveolar effects of the expansion performed with the various devices are similar.

Methods: a bibliography research was conducted through different databases (PubMed, Scielo, Lilacs) and it was performed independently by two authors, for a period of time from January 1990 until December 2022. All articles selected are written in English, and concern palatal expansion in human patients with labio-palatal cleft.

Results: after full reading of 1133 articles only 11 of those met the inclusion criteria.

The orthodontics appliances that have been used are: Quad Helix, Hyrax, 4-band expander, Haas, Maxillary Expander with Differential Opening (EDO). Overall, all the appliances used have proven effective in correction of cross-sectional problems of patients with labio-palatal cleft, with little statistically significant difference.

Conclusions: slow expansion with quad helix, though requiring a longer treatment time, allows to have more control over molar rotation.

The use of devices with anterior expansion screws can be useful for expanding mainly the anterior sector, which is particularly contract in these patients.

As for the side effects of dental tipping, the results of this review are controversial and make it impossible to draw a definitive conclusion.

RELATION BETWEEN DENTAL ANXIETY AND SELF-RATED DEGREE OF MALOCCLUSION IN ADOLESCENTS

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Aim: to assess the relation between dental anxiety and subjective degree of malocclusion in adolescents.

Methods: Adolescents (10-18 years old) were recruited at the Clinic of Orthodontics of the University of Naples Federico II. Dental anxiety was measured with two scales: the Modified Dental Anxiety Scale (for subjects <14 years old), and the Dental Anxiety Scale (for subjects 14-18 years old). The self-rated degree of malocclusion was assessed with the Aesthetic Component of the Index of Orthodontic Treatment Need (AC-IOTN). The sample was divided according to the AC-IOTN scores: AC-IOTN <4, no/mild malocclusion and AC-IOTN ≥4, moderate/severe malocclusion). Means and standard deviations were computed for the anxiety score. An unpaired sample t-test was used for the between-groups comparison and a linear regression analysis was used to measure the association between variables. Significant levels were set at $P < 0.05$.

Results: thirty-one (31) subjects were recruited (17 M; 14 F). More than half of them (N = 17) rated themselves as having no/mild malocclusion.

Subjects with moderate/severe malocclusion presented significantly higher anxiety score as compared to individuals with no/mild malocclusion (17.8±5.8 *vs* 11.5±5.5). Also, a significant association between dental anxiety and self-reported malocclusion was found (B = 6.3; C.I. 95% 2.1-10.5, P = 0.004).

Conclusions: self-perception of a more severe degree of malocclusion is associated with increased anxiety levels in adolescent individuals.

3D EVOLUTION OF THE LIP-TO-TEETH RATIO AS A FUCTION OF AGE IN A HEALTHY GROUP

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Aim: this study aims to evaluate the effects of aging on the relationship between the deep and superficial structures of the face, in particular the lip area, by analyzing in the three dimensions of space the lip line (LL), the occlusal plane (OP) and the position of the teeth.

Methods: twenty-nine Caucasian adults were selected without major facial disharmonies, without caries or periodontal disease, with complete dental arches and in Angle class I. Participants were divided into two age groups: G1 (18 subjects - 21 to 34 years) and G2 (11 subjects - 34 to 50 years). Using dental plaster, impressions of the skin surface and labial mucosa were taken. Using a computerized electromechanical digitizer, several points on standardized vertical and horizontal lines were digitized for both casts. Through a commercial software for the 3D creation of solids, starting from single reference points, the casts were digitally reconstructed and modeled using NURBS (non uniform rational B-spline) curves. On the digitized solid, OP, LL and teeth position were analyzed and compared using Student *t*-test.

Results: LL values in relation to OP were significantly lower in G2 than in G1. Age significantly influences the morphological characteristics of the labial area ($p < 0.05$).

Conclusions: labial area significantly varies with age. 3D reproduction could be a non-invasive solution to evaluate the relationship between the effects of aging, deep structures, teeth and lips.

PARENTS' KNOWLEDGE ABOUT EARLY ORTHODONTIC CONSULTATION: A SURVEY STUDY

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Aim: orthodontic treatment during growth has a crucial role in the interception of dental-skeletal developmental problems. The aim of this study was to evaluate parents' knowledge about early orthodontic consultation and treatment for their school-aged children.

Methods: an anonymous online 26-items survey was developed with the help of Google Form and spread to parents of children aged between 6 and 11 years from Southern Italy. The items were grouped in 3 sections: (1) sociodemographic characteristics of parents/children; (2) parents' perception of their child dentoskeletal issues; (3) parents' awareness about early orthodontic treatments. Descriptive statistics was performed, and frequencies and percentages were computed for each item.

Results: survey participants were 142 (83.8% mothers, 16.2% fathers), mainly aged between 40 and 50 (46.5%). More than half of the respondents thought that their children had problems with the alignment of their teeth, and most of them also performed a first dental consultation.

Almost all parents who perceived skeletal problems consulted a dentist for these problems. In addition, only 12 parents observed problems in the oral functions of their children, of which 9 considered appropriate to have a dental examination and 11 a consultation with other specialists. Most parents believed that early orthodontic treatment could resolve jaw development issues and could reduce the need for further treatment during adolescence.

Conclusions: a satisfactory level of awareness regarding the need for early orthodontic consultation and interventions was observed in the studied population.

DEVELOPMENT OF NEW INSTRUMENT FOR THE EVALUATION OF ORAL BEHAVIOURS IN CHILDREN

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Aim: the aims of this study are to create an oral behavior checklist (OBC) questionnaire intended for children and adolescents and to evaluate its reproducibility.

Methods: two questionnaires were submitted to 255 students at school. Both questionnaires were suitable for children and adolescents, the first version include 21questions written in a more understandable language with only 3 options of answer and 21 corresponding images and emoticons, was administrated to 128 pupils (mean age 10.39).

The second questionnaire was without images or emoticons and was administrated to 127 pupils (mean age 10.64). For the evaluation of the reproducibility of the questionnaire, they were administered to both groups on the same day, in order to subsequently compare the two answers for each question of each pupil.

Between one administration and the next, the pupils were given a lesson in oral hygiene and prevention of dental caries, in order to forget the first answer given.

Results: analysing the total Cohen's K coefficient of both the number of pupils and that referred to the individual answers, there are no differences in terms of reproducibility between the questionnaires with images and without images, therefore, the linguistic translation performed was sufficient for understanding. Even if the submission of the two questionnaires on the same day brought some advantages , a longer period of time would have been necessary between one questionnaire and another.

Conclusions: this study created a new adapted version of the OBC-21 for children and adolescents. In this study both version with and without images were reproducible.

UPPER AIRWAY CHANGES IN II CLASS PATIENTS AFTER THE APPLICATION OF AN INTERCEPTIVE DEVICE

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Aim: mandibular retrognathia in II skeletal classes is often associated with reduced air passage in the upper airways because of their dimensions.

This study aims to analyze the effects of Twin Block appliance on sagittal pharyngeal dimensions in growing skeletal class II patients.

Methods: cephalometric analyses were performed at the beginning (T_0) and end of treatment (T_1) with Twin block of 16 growing patients (12 M and 4 F) with II class malocclusion recruited at the Department of Orthodontics of Policlinico of Bari.

The statistical analysis was carried out using T-test to analyze the cephalometric differences between T_0 and T_1. The level of significance was set at $p < 0.05$. Then, a simple linear regression was conducted to identify a correlation between sagittal and vertical changes and pharyngeal dimensions at five different levels (P1, P2, P3, P4, P5).

Results: cephalometric comparison of SNB and Go-Me revealed mandibular advancement after treatment.

It also found a statistical correlation between the changes in mandibular length and the changes in the volume of the airway at P3 and P4.

Conclusions: this study reported that sagittal upper airway dimensions are related to the sagittal position of the mandible. Use of devices that promote mandibular advancement in growing patients results in increased upper airway diameters.

DENTOALVEOLAR EFFECTS RELATED TO MAXILLARY EXPANSION: COMPARISON OF TREE DEVICES

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Aim: maxillary transverse deficit is most common problems in craniofacial region; evaluation of dento-alveolar effects was performed on growing patients treated with REP (Hyrax expander), SME (Leaf expander) and Invisalign First.

Methods: all digital models in STL format were analyzed with Mimics Materialize. Points and lines of upper and lower arch were identified: 5.3-6.3-5.4-6.4-5.5-1.6-2.6-3.6-4.6 mesiobuccal cusps of the corresponding teeth G16 and G26: gingival margins palatal permanent molars; measurements were evaluated T_0 and T_1 after expansion and statistical analysis was carried out on three groups studied using the Ttest, ANOVA test and post hoc Tukey's test with Bonferroni's correction.

Results: comparable maxillary deficits of groups at T_0 and a same amount of device expansion, similar maxillary expansion on 5.5-6.5 in LEAF and REP group. FIRST group shows similar values to other two groups for first molars, but REP group expands more on deciduous canines than FIRST group. LEAF group expands more on deciduous molars and canines than FIRST group.

Conclusions: FIRST group showed improvement in shape of maxillary arch, unlike REP and LEAF groups, retained the initial triangular shape in the anterior portion of maxilla.

FIRST group is able to induce significant morphological changes in shape of arch as in REP and LEAF groups, but the characteristic feature of this group compared with the other two is that the increased space in the incisal sector, is immediately used for the correct positioning of the central and lateral incisors.

CEPHALOMETRIC EVALUATION OF THE UPPER AIRWAYS CHANGES ASSOCIATED WITH THE PENDULUM

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Aim: the aim of the following study was to describe if any dimensional changes occurred in the upper airways in growing patients with class II malocclusion after therapy with the Pendulum appliance.

Methods: to analyze changes in the upper airways, the cephalometric tracings of 88 growing patients were analyzed, including 36 patients in skeletal class II and 54 patients in the skeletal class I who represented the control group. A specific cephalometry was formulated and used for the evaluation of the upper airways. Cephalometries were drawn before starting the therapy (T_0) and after the Pendulum therapy (T_1). The average age of patients was 12 years and 6 months at T_1, and the average duration of the therapy with Pendulum appliance was 7 months.

Results: in the assessment of the values obtained, no significant changes in thicknesses, spaces, and distances of the upper airways between T_0 and T_1 was observed in patients in skeletal class I (control group), whereas in skeletal class II the values remained rather stable with the exception of a significant reduction of the IPS and EPS pharyngeal spaces between T_0 and T_1.

Conclusions: treatment with the Pendulum appliance in growing skeletal class II patients did not cause major changes in the upper airways other than a reduction in the pharyngeal spaces.

3D ANTHROPOMETRIC STUDY OF MOUTH AND LIP AREA IN HEALTHY YOUNG ADULTS

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Aim: this study aims to describe three-dimensionally the morphometric characteristics of the mouth of healthy young adults, with a focus on the lips area, volume and thickness.

Methods: an anthropometric investigation was performed on young adults who met the following criteria: white Caucasians, Angle class I, OVJ <5 mm; exclusion criteria were: history of craniofacial trauma, congenital anomalies and/or surgery, prosthodontic and/or conservative restorations of frontal teeth. 21 subjects (12 men, 9 women, age range 21 to 34 years, mean age 25.6 years) were enrolled in the study. Impressions of the extra-oral (cutaneous) and intra-oral (mucosal) surfaces of the lips were taken and cast in dental stone. Afterwards, landmarks on standardized horizontal and vertical lines were digitized using an electromechanical digitizer (Microscribe G2, Immersion Corporation, USA); casts ware digitized through a software for 3D modelling of solids (Rhinoceros 3.0; Robert McNeel & Ass.) and shaped using NURBS (Non Uniform Rational B-Spline) curves from single landmarks. Data concerning vermillion surface area, lip volume and lip thickness was gathered. Comparisons between women and men were made using Student's t-test.

Results: vermillion area of upper and lower lips resulted to be larger in men than in women, however statistical significance was not reached. Volume of both upper and lower lips was significantly larger in men (upper lip: $p = 0.037$; lower lip: $p = 0.007$). Mean lip thickness was smaller in women ($p = 0.002$).

Conclusions: sexual dimorphism for labial volume and thickness was highlighted.