LONG TERM DENTAL STABILITY AFTER ORTHOGNATIC SURGERY: AN ANALYSIS REVIEW OF THE LITERATURE

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Aim: the aim of this literature review was to evaluate the long-term dental stability after orthognathic surgery, by evidences available in the literature.

Methods: an electronic search was performed on PubMed (Medline), using the keywords: "Dental Stability" AND "Orthognathic Surgery".

Systematic reviews, RCTs, longitudinal controlled clinical trials written in English, from 2013 to 2023 have been included. Scientific articles not completely related were automatically discarded.

According to these eligibility criteria, 8 articles were selected.

Results: long-term dental stability after orthognathic surgery is a controversial topic in the literature. It is influenced by multiple factors such as patient-related, orthodontic and surgical aspects.

According to the findings from this review, several risk factors for dental relapses after orthognathic surgery are described in literature as: surgical complications, poor occlusal stability, large OB, negative OVJ, deep curve of Spee.

Different studies suggest variability of dental stability in both skeletal class II and III patients. In general, OVJ tended to increase in skeletal class II and decrease in skeletal class III patients over time, independent of the type of osteotomy or direction of movement performed. Overbite increased in class II patients, whereas class III showed variable results.

Conclusions: in conclusion, current evidences suggest that to reduce relapses, risk factor should be prevented. Further, about the different surgical procedures and dento-skeletal outcomes, more studies are required.

NASAL PROSTHESIS RESTORATION IN A PATIENT WITH A SURGICAL RESECTION OF THE NOSE

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Aim: a 60 years-old patient with a surgical resection of the nose due to squamous cell carcinoma, needs to restore the defect with a facial prosthesis. Digital technologies are employed in this case report.

Methods: face scanner: Artec Space Spider (Artec 3D Lussemburgo) is a high-resolution scanner with a 1 mln point/s. Digital impression is rendered by the software Artec Studio Project, allowing the creation of a 3D model.

Sculpting: Zbrush software (Pixologic Inc., Los Angeles, CA) is used for artistic objects. The modelling of the nose is made by tools and brush.

3D Sprint: is a software for editing, management and optimised workflow for printing objects. 3D System Print (Rock Hill, SC USA): Nexdent 5100-3D System is an LCD high resolution printer combined with printing materials for medical device biocompatible. LC-3D SystemPrint Box UV Unit (Rock Hill, SC USA): is used to post-curing the photosensitive material.

Results: using the brand-new digital technology, a device to test out a nasal prosthesis has been made. A very precise facial prosthesis is made using digital impressions taken with facial scanners, software sculpting, and 3D printing. The patient's nose try-in demonstrates the defect's accuracy along the edge, and the patient confirms the aesthetic shape.

Conclusions: maxillofacial prostheses are required to restore facial defects caused by cancer- related surgical resections. New technologies assist producing try-in prostheses that are effective and efficient as well as a less invasive method for detecting impressions.

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GORHAM-STOUT DISEASE IN MAXILLARY BONE, DIAGNOSIS AND NONSURGICAL TREATMENT: A CASE REPORT

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Aim: Gorham-Stout Disease (GSD) is a rare lymphatic disorder which results in bone destruction. The treatments for GSD include drugs therapies and/or radiation and surgical approach. The aim of this study is to report a non-surgical case successfully treated with bisphosphonates.

Methods: a 67 years-old female patient presented facial asymmetry, localized pain to the right maxilla and both vertical and horizontal diplopia. The OPG, the CT and the MRI revealed the presence of an osteolytic lesion involving the zygomatic arch, the orbital floor, the alveolar process and the maxillary sinus. Medical therapy with intravenous zoledronic acid (4 mg every 28 days), vitamin D and calcium carbonate was administered for six months. The patient, with a monthly recurrence, had to check her calcium and creatinine levels. OPG, CT, and MRI were performed alternately every two months for one year to follow up the evolution of the disease.

Results: the patient referred absence of pain without adverse effects and clinical improvement. Radiologic findings confirmed the quiescence of osteolytic phenomena. After one year of therapy no sign of disease progression was observed so medical therapy was interrupted.

Conclusions: maxillofacial surgeons and dentists play an important role in identifying this pathology and should include it in the differential diagnosis of any osteolytic process of the jaw.

DIGITALIZATION OF IMPLANT-PROSTHETIC REHABILITATION IN NOSE CANCER: A CASE REPORT

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Aim: facial rehabilitation in H&N cancer patients has been improved by use of endosseous implants, providing a long-term reliable option for reconstruction. Piezoeletric implantology – with the ultrasonic implant site preparation (UISP) – can be used to improve a faster tissue healing and to maximize primary stability, empowering early loading of implants. The clinical case consists of using of the UISP for the placement of two implants in the anterior maxilla in a patient with nose cancer. The aim is to apply UISP and digital planning to reduce surgical risk and optimize bone healing, allowing shorter rehabilitation times.

Methods: the case study started with the computer-aid surgical planning made on the CBCT. The patient underwent a partial rhinectomy including the tip of the nose, leaving the anterior margin of the upper maxilla free from neoplasia. Then the UISP was performed with piezoelectric inserts and the implant placement was carried out with the dynamometric lever. After, the MUAs were inserted, and the optical impression was taken.

Results: one month after surgery the provisional removable nasal epithesis supported by peek extensions screwed on implants was delivered. The final nasal prosthesis will be constructed after the end of radiotherapy.

Conclusions: the use of the UISP together with the digital planning allowed to achieve primary stability, granting a simplification of the surgical steps and a rapid esthetic rehabilitation, which is essential for the patient to return to the social sphere in the least shattering way possible.

ITALIAN SCIENTIFIC PRODUCTION IN DENTISTRY: A BIBLIOMETRIC ANALYSIS FROM 1993 TO 2022

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Aim: in the last decades, Italian scientific production has grown in different areas of medical sciences, including dentistry. Understanding the trends and patterns of scientific output in dentistry can provide insights into the research interests and priorities of Italian dental researchers, as well as identify potential areas for future research. The aim of this study was to perform a bibliometric analysis of scientific production by authors with Italian affiliation from 1993 to 2022.

Methods: a search was conducted until December 2022 for all articles published in journals indexed under the Scopus category "Dentistry", with at least one author affiliated with an Italian institution. The bibliometric data was extracted and summarized for analysis. Additionally, a comparison of scientific production across three different decades (1993-2002, 2003-2012, and 2013-2022) was conducted.

Results: the study identified 16305 records published in 434 different sources, with an average annual growth rate of 10.2%. The year 2020 saw the highest number of published articles (1038), while the highest number of citations (180688) was collected in the decade 2003-2012.

Over time, the average number of authors per article has increased from 4 to 6.

The University of Milan was the most productive affiliation, while Minerva Dental and Oral Science (formerly Minerva Stomatologica) and Dental Cadmos were the most productive sources. Furthermore, a co-occurrence analysis of author keywords revealed changing topic interests over time.

Conclusions: the total number of publications increased steadily over the years, as did the mean number of citations per year.

However, this analysis is limited to publications in the Scopus database, and further studies are needed to evaluate the quality and impact of Italian dental research and identify areas for improvement and investment.

EFFECTS OF SURGICAL TREATMENT ON MANDIBULAR CONDYLAR FRACTURES WITH HEAD DISLOCATION

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Aim: a radiological classification is necessary to evaluate the topography of mandibular condylar fractures and the grade of displacement of the condylar head and then to decide the treatment, which can be surgical or non-surgical. This study aimed to assess the grade of displacement and to understand its correlation to the success or failure of the surgical treatment.

Methods: CT scans of 34 surgical patients with 40 mandibular condylar fractures were collected before and after surgical treatment. Topography of fracture and displacement of condylar head with regard to the glenoid fossa were analyzed using the AOCMF Level 3 Classification System for Condylar Process Fractures. The grade of displacement was recorded pretreatment and 6 months after treatment.

Results: condylar base fractures were the most common (65%), followed by neck region (30%) and condylar head (5%). Before treatment, absence of displacement was observed in 17.5% of fractures, while displacement and dislocation were 65% and 17.5%, respectively. A complete resolution of displacement and dislocation was found in all patients that underwent surgical treatment.

Conclusions: a radiological classification is useful in order to highlight topography of mandibular condylar fractures and the grade of displacement of the condylar head and then to decide the type of treatment to choose. Surgical treatment has proven to be effective in treating displacement and dislocation.

COST-EFFECTIVENESS ANALYSIS OF ENDOSCOPY *VS* GLAND EXCISION FOR SIALOLITHIASIS TREATMENT

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Aim: sialolithiasis is one of the major diseases of salivary glands. For many decades, gland excision represented the treatment of choice. In the last years, attention has been focused on more conservative approaches, making sialoendoscopy increasingly used for diagnosis and treatment of sialolithiasis. The aim of present work is to compare the two approaches in terms of costs and effectiveness.

Methods: a decision tree with two branches, Sialoendoscopy and Sialoadenectomy, has been modelled using TreeAge Pro software. Costs were obtained from hospital services tariff of Campania region (Italy). The effectiveness of each intervention, expressed in Quality Adjusted Life Years (QALYs) was estimated basing on the available literature. Surgical outcome probabilities (success, failure, complications, recurrence) were extracted from a database, containing 248 patients with sialolithiasis treated with sialoendoscopy (150) and sialoadenectomy (98) at University Luigi Vanvitelli.

Results: the sialoendoscopy resulted to be a cost-effective approach, characterized by lower cumulative costs (2276 *vs* 3246 €) and greater utilities (0.97 *vs* 0.96 QALYs), compared to gland excision, even if accompanied by a lower success rate (56%) after first endoscopy and requiring re-intervention in 21% of cases, in comparison to almost 100% of resolution after gland excision.

Conclusions: sialoendoscopy should be considered as primary approach for the treatment of sialolithiasis, since it provides economic benefit and better quality of life for the patients.

QUALITATIVE AND QUANTITATIVE AUTOMATED 3D ANALYSIS ON ACCURACY OF FACIAL SCAN

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Aim: the aim of this study was to evaluate the accuracy of three-dimensional (3D) facial scans taken with a facial scanner App available for iPhone.

Methods: twelve patients requiring large field of view CBCT scans were enrolled, and 3D facial scan was acquired at the same moment with a facial scanner App for iPhone (EM3D) by rotating the phone around the patient's head. The software 3D Slicer was used for the qualitative and quantitative analysis. An automated surface registration was performed using the soft tissue segmentation of the CBCT as reference. The 3D model obtained by the App was superimposed with the 3D model of the CBCT scans for each patient, recording linear and volumetric differences with automated tools. Fifteen soft tissue landmarks were also identified on each model, and linear and angular measurements were calculated. Statistical analysis was performed setting $\alpha = 0.05$.

Results: patients requiring CBCT scans for severe dentoskeletal malocclusions were included. Statistical analysis showed accuracy between CBCT scans and 3D facial scans. The average value of linear differences between the 3D CBCT models and the 3D facial scans was 0.218±1.814 mm. No statistical differences in comparing the two models were recorded neither for linear nor for angular measurements ($p > 0.05$).

Conclusions: three-dimensional facial scans taken with facial scanner App showed negligible differences and a good clinical accuracy when compared with CBCT scans.

CAN FACIAL SKELETAL ASYMMETRY HAVE AN INFLUENCE ON UPPER AIRWAY MORPHOLOGY?

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Aim: a three-dimensional (3D) analysis of the upper airway morphology was conducted to compare Class III patients with and without skeletal asymmetry.

Methods: a retrospective study was designed to collect Cone-beam computed tomography (CBCT) scans of patients with Class III malocclusion. Mandibular deviation higher than 4 mm was the primary predictor variable to distinguish symmetric group (SG) and asymmetric group (AG). Using Slicer3D software, 3D reconstruction of the upper airways was generated and different models were obtained according to different anatomical areas (nasal cavity, nasopharynx, velopharynx, and glossopharynx). Volume and minimal cross-sectional Surface were calculated as outcomes. Statistical analysis was performed setting $\alpha = 0.05$.

Results: the study included 28 patients in AG and 30 patients in SG (mean age 28,1). Descriptive statistics showed higher values in the SG compared to AG for each variable. Minimal cross-sectional Surface didn't show any statistical significance neither in the total evaluation, not in the different areas of interest ($p > 0.05$). The total volume was significantly higher in SG compared to AG ($p < 0.05$). Linear regression model showed a positive significative correlation between the total volume with the glossopharinx volume, with the minimal surface of the total upper airways, and with the minimal surface at velopharinx ($p < 0.05$).

Conclusions: upper airways morphology in class III patients could be slightly influenced by skeletal asymmetry. Prospective studies with breathing assessment should evaluate the clinical relevance.

CUSTOM-MADE SUBPERIOSTEAL IMPLANTS FOR PROSTHETIC RESTORATION IN SEVERELY ATROPHIC JAWS

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Aim: subperiosteal implants were introduced in 1941. Poor clinical results led those implants to be progressively abandoned. This study aimed to evaluate an operative and surgical procedure for the application of custom-made 3D-printed subperiosteal implants for fixed prosthetic restoration of severely atrophic jaws to minimize complications.

Methods: between January 2017 and December 2021, all patients who presented to our department with partially and total edentulous jaws, who did not want to undergo bone regenerative procedures or were not eligible to other rehabilitation treatments, were included in this study. These patients were rehabilitated with custom-made subperiosteal implants, designed from CBCT and fabricated in titanium. Evaluation was carried out using a questionnaire before the treatment and one year after the treatment for four items: Chewing, Esthetic, Fonetic and Comfort. All patients were followed up for 1 year after surgery.

Results: 18 patients, were included in the study. At the one-year follow-up, no implants were lost (survival rate 100%). One implant presented late minor complication with slight exposition (2 mm) of the implant. The final complication rate amounted to 5,6% (one out of eighteen patients). In the entire sample, the post-operative questionnaire score increased for all four items.

Conclusions: this surgical technique may represent an alternative treatment procedure in patients with severely atrophic jaws, since it permits to avoid of regenerative bone therapies. Further studies are needed to confirm these outcomes.

CHANGES IN THE UPPER AIRWAYS MORPHOLOGY IN RELATION TO ORTHOGNATHIC SURGERY

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Aim: this pilot study aimed to evaluate the 3D modifications of the upper airway morphology after orthognathic surgery, correlating the results with the amount of the jaws' displacements.

Methods: pre-surgical (T1) and 1-year post-surgical (T2) CBCT scans of adult patients with skeletal Class III malocclusion were collected. 3D Slicer and Dolphin Imaging software were used for the 3D analysis. After T1 CBCT orientation, T2 CBCT was automatically registered selecting the cranial base as the reference area of superimposition. Automated landmarks identification was performed to determine the maxillary and mandibular movements in all three spatial directions. Automated segmentation of the upper airways was generated, and different models were obtained (nasal cavity, nasopharynx, velopharynx, and glossopharynx). Automated quantitative assessments allowed to calculate the volume and the minimal cross-sectional area at T1 and T2. Statistical analysis was performed ($\alpha = 0.05$).

Results: the study included 15 patients. Descriptive statistics showed higher values at T2 for all measurements with an increasing trend after surgery. However, no significant difference in volume and area was recorded comparing the two timepoints ($p > 0.05$). Linear regression showed that the upper airways surface is negatively correlated with mandibular setback, whereas the volume is directly related to area's changes ($p < 0.05$).

Conclusions: preliminary results indicated that orthognathic surgery may influence the upper airways morphology in patients with class III malocclusion, mainly after mandibular repositioning.

MMA IN PATIENT WITH SEVERE OSAS: "SURGERY FIRST" APPROACH AS AN IMMEDIATE SOLUTION

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Aim: in the present study the authors discuss the application and the reliability of "Surgery First" approach as an Alternative for Maxillomandibular Advancement (MMA) in patients affected by severe Obstructive Sleep Apnea (OSA).

Methods: a 23-year-old male patient diagnosed with OSA, based on an apnea-hypopnea index (AHI) score of 51,8. He was affected by Class II malocclusion with hypodivergent pattern, a brachycephalic biotype, and short mandibular condyles. Initial cone-beam computed tomography (CBCT) showed a reduced upper airway diameter. "Surgery first" approach followed by orthodontics, was chosen.

Results: an immediate improvement was observed in the soft-tissue profile after surgery. The postsurgical CBCT showed an increase of more than 100% in upper airway diameter. Post-treatment records confirmed that we had optimized the patient's facial and dental esthetics, improved the overjet and overbite, and aligned the dental arches. Polysomnography exams were performed before and after treatment. An overall follow-up of 6 months was performed, demonstrating an apnea hypopnea index (AHI) reduction from 51.8 events/hour to 8.8 events/hour, oxygen desaturation index (ODI) 8.3 events/hour. No complications were reported at 6 months control.

Conclusions: the "Surgery first" approach is an excellent treatment option for the correction of skeletal dysplasia and can immediately address the problem without presurgical orthodontic treatment.

CAD/CAM RECONSTRUCTION AND IMPLANT SURGERY, IN MAXILLARY RESECTION AND FREE FIBULA FLAP

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The free fibula flap is a reliable approach used to reconstruct maxillofacial osseous defects. CAD/CAM maxillary reconstruction with FFF and dental implant is a surgical technique which can allow the achievement of esthetical and functional rehabilitation.

Aim: the present study analyzed the possibility of proceeding with maxillary resection, maxillary reconstruction, and dental implant surgery in the same surgical procedure, evaluating: 1) the discrepancy between the pre-operative virtual plan and the post operative results obtained by computer tomography (CT); 2) patient satisfaction; 3) peri-implant tissue health.

Methods: seven patients have been treated by means of free fibula flap maxillary reconstruction, together with the insertion of 20 dental implants. A computer tomography was performed between 60 to 360 days after reconstructive surgery and has been compared to the virtual planning. Peri-implant health has been evaluated during the follow-up period with a periodontal probe and periapical radiographs. Patient satisfaction has been evaluated with specific questionnaires.

Results: the virtual planning of all seven patients allowed to proceed with prosthetic dental rehabilitation

The mean score for patient satisfaction was 7.8 (on a scale from 0 to 10). Furthermore, the analysis of peri-implant tissue health showed a high implant survival rate (90%).

Conclusions: within the limit of the sample size and the short follow-up, the results of this clinical study are encouraging mostly because this surgical technique allows shorter rehabilitation time and better life being for oncological patients.

THE USE OF THE "HUGHES FLAP" FOR THE RECONSTRUCTION OF DEFECTS OF THE LOWER EYELID

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Introduzione: a seconda del coinvolgimento del margine palpebrale orizzontale, sono state utilizzate diverse tecniche per la ricostruzione di difetti palpebrali a tutto spessore. Questi includono il lembo di rotazione semicircolare Tenzel, l'innesto tarsocongiuntivale libero, il lembo di rotazione della guancia Mustardé ed il lembo tarsocongiuntivale (procedura di Hughes). L'utilizzo del "lembo di Hughes" o lembo tarso-congiuntivale, è una tecnica chirurgica per la ricostruzione di difetti della palpebra inferiore, a tutto spessore, in caso di asportazioni oncologiche. L'asportazione può interessare fino alla totalità della palpebra inferiore e l'intervento si prefigge di ripristinare anatomia e funzione con il miglior risultato estetico possibile.

La procedura di Hughes modificata è una tecnica adatta per la ricostruzione dei difetti della palpebra inferiore che interessano fino al 100% della lunghezza orizzontale della palpebra. Lasciare il muscolo di Müller attaccato al lembo di Hughes previene la deiscenza prematura del lembo senza aumentare a sua volta la frequenza delle retrazioni della palpebra superiore. L'utilizzo di un innesto cutaneo libero o di un lembo di avanzamento pelle-muscolo per la ricostruzione della lamella anteriore sembra essere insignificante per il risultato estetico-funzionale.

Conclusione: verranno descritte la nostra esperienza a partire dal flow chart decisionale per la scelta della tecnica ricostruttiva e verranno riportati una serie di pazienti trattati al fine di evidenziare le ottime caratteristiche ricostruttive del lembo di Hughes.