CAN RAPID MAXILLARY EXPANSION BE CONSIDERED A PREVENTIVE MEASURE IN PATIENTS WITH SUSPECTED SLEEP-DISORDERED BREATHING?

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Aim: the purpose of this study was to evaluate the clinical effectiveness of Rapid Maxillary Expansion (RME) in patients with maxillary transverse deficiency and pediatric sleep-disordered breathing (SDB). The study examined the effects of RME as a primary treatment and as therapy for residual symptoms following adenotonsillectomy (AT) on respiratory (AHI) and neurological (PLMS) parameters.

Methods: a Hyrax-type expander with a six-month retention protocol was used to treat children aged 4-17 years with SDB/OSA and maxillary constriction. Assessments included: Polysomnography (PSG): monitoring of AHI, RDI, oxygen saturation, PLMS, Arousal Index, and sleep architecture. Clinical grading using Friedman and Mallampati score, and cephalometric analysis. Quality of Life/Behavioral Measures: parental questionnaires (OSA-18, PSQ, CAS, Modified ESS).

Results: RME significantly reduced AHI and the PLMS index (from 4.15 to 1.08), improving sleep stability. Standardized questionnaires confirmed improvements in hyperactivity, inattention, and daytime somnolence. Unlike AT, which targets soft tissue, RME provides skeletal correction, increasing nasal volume and reducing airway resistance. Maxillary constriction and high Mallampati scores (3-4) predict persistence of SDB after AT in about 44.2% of cases; therefore, RME may play a key role in addressing anatomical deficits.

Conclusions: early orthopedic intervention and a multidisciplinary approach are essential to address skeletal deficiencies often overlooked by soft-tissue surgery.

EARLY TREATMENT OF INCIPIENT CARIES LESIONS IN PRIMARY DENTITION: EFFECTIVENESS OF THE SELF-ASSEMBLING PEPTIDE (P11-4)

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Aim: to evaluate the effectiveness of self-assembling peptide (p11-4) in incipient caries in primary dentition.

Methods: early diagnosis and remineralization are essential components of caries management in pediatric patients.

The p11-4 peptide is composed of natural occurring aminoacids with high affinity for hydroxyapatite, able to self-assemble into a biomimetic matrix. Within 5 min, the peptide diffuses into the depth of the caries lesion, forming a biomatrix that attracts calcium and phosphate ions from saliva. As a result, the progression of the carious lesion is halted, and regression occurs through the regeneration of hydroxyapatite.

This prospective study evaluated the remineralization potential of p11-4 in the treatment of interproximal caries in primary dentition. This study included patients aged 3-10 years, presenting good compliance, with asymptomatic vital primary teeth showing initial active, non-cavitated interproximal caries (ICDAS II scores 1/2; radiographic scores E1/E2). Data collection was based on clinical evaluation (objective examination, ICDAS grading) and instrumental assessment (bitewing radiographs, DIAGNOcam images), performed every 3 months, up to 12 months after treatment.

Results: preliminary results showed that more than 60% of lesions improved, 35% remained stable and less than 10% of treated lesions appeared to have progressed.

Conclusions: the p11-4 self-assembling peptide seemed effective in remineralizing initial interproximal carious lesions of deciduous teeth in a 9 to 12-month follow-up.

Doi: 10.19256/abstract.cduo.09.2026

PREVALENCE OF TOOTH DECAY IN DECIDUOUS AND PERMANENT TEETH IN A SCHOOLCHILDREN POPULATION: AN EPIDEMIOLOGICAL INVESTIGATION

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Aim: the aim of the present study was to assess the prevalence of dental caries in a population of schoolchildren in Rome (Italy) with different age ranges.

Methods: the study involved 1033 subjects, aged 6 to 14 years, attending public schools. All the subjects were divided into three different age groups: 6 to 8 years (Group A), 9 to 11 years (Group B) and 12 to 14 years (Group C), respectively. Group A consisted of 385 children (197 m, 188 f) with a mean age of 6.9 ± 0.8 years; Group B consisted of 355 subjects (188 m, 167 f) with a mean age of 10.5 ±1.2 years; Group C consisted of 293 subjects (157 m, 136 f) with a mean age of 12.6 ± 0.9 years. The oral conditions of the selected subjects were evaluated by six expert examiners and the prevalence of dental caries in both deciduous and permanent teeth was calculated. The Pearson Chi-square test was used to perform the statistical analysis. The level of significance was set at $p < 0.05$.

Results: in Group A, 255 subjects were caries free. Among the 160 children with caries, 126 presented lesions on deciduous teeth and 34 on permanent teeth. Similarly, more than half of the students of Group B were caries free (226 subjects) whereas a total of 129 students showed caries in primary (82) and permanent teeth (47). Dental caries on permanent teeth were present in most of the subjects of Group C (35 subjects), while only 10 participants showed caries on primary teeth. In the same group, a large number of participants (248 subjects) were caries free.

Conclusions: dental caries remain a major public health concern in the schoolchildren population in Rome. The findings of this study highlight how dental screening plays an important role in improving public oral health conditions, and involving school may help motivate teachers and parents to promote good oral hygiene habits.

CONDYLAR FRACTURES IN GROWING PATIENTS: THE ROLE OF EARLY FUNCTIONAL REHABILITATION

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Aim: facial skeletal trauma is highly prevalent in pediatric populations. Orthodontist plays a crucial role in preventing long-term negative impacts on facial development. This study aimed to emphasize the importance of early functional rehabilitation in promoting effective remodeling of fractured condyles in growing patients.

Methods: growing patients with condylar fractures were treated and evaluated according to a multi-phase protocol:

- rigid intermaxillary fixation (IMF) was applied for approximately 15 days using splints or metallic ligature wires on fixed appliances;
- following IMF removal, a lower arch splint was worn for 7 days;
- progressive resin rebasing of the splint on the fractured side was performed to increase vertical dimension, restore occlusal height, and stimulate condylar remodeling;
- periodic follow-ups were conducted according to fracture type.

Results: in all cases, the protocol successfully restored condylar morphology and re-established proper three-dimensional stomatognathic relationships. Full functional recovery was observed in all patients.

Conclusions: orthodontic-functional treatment represents a primary approach for managing condylar fractures in growing patients. Early restoration of function is essential for achieving stable and optimal morpho-functional rehabilitation of the stomatognathic system.

NATAL TEETH IN PRETERM TWINS: REPORT OF TWO RARE CASES AND REVIEW OF THE LITERATURE

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Aim: natal teeth are a rare developmental anomaly, defined as the presence of teeth at birth, with an unclear and multifactorial etiology. This study aims to describe two clinical cases of preterm twins presenting with natal teeth and to explore possible shared etiological factors, with particular attention to the role of twin gestation.

Methods: we report two cases of twin pairs: one male pair from Pakistan and one female pair from Afghanistan, all born prematurely and presenting natal teeth at birth. Clinical examination assessed tooth location, morphology, and mobility. Perinatal data, including gestational age and general health conditions, were collected. A narrative review of the literature was conducted to contextualize potential etiological factors, focusing on reports of natal teeth in twins.

Results: in both twin pairs, natal teeth were in the mandibular anterior region, according to the most frequently reported site. All teeth exhibited marked mobility. Due to the high risk of aspiration or ingestion, extraction was performed in all cases without complications. The occurrence of natal teeth in both individuals of each twin pair represents an exceptionally rare finding, as cases in twins are rarely reported and mainly limited to isolated case reports. This observation suggests a potential role of shared intrauterine environmental factors and/or genetic predisposition. Prematurity may have contributed to altered timing of dental development, possibly related to a superficial position of the tooth germ.

Conclusions: these findings support the hypothesis of a multifactorial etiology of natal teeth, involving genetic susceptibility and intrauterine environmental influences. Further studies are needed to clarify the mechanisms underlying this condition, particularly in preterm and twin populations.

MANAGEMENT OF TOOTH AVULSION WITH DELAYED REPLANTATION AND REGENERATIVE ENDODONTIC THERAPY IN A PEDIATRIC PATIENT

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Aim: to describe the management and outcome of a delayed replantation in a paediatric patient with tooth avulsion, highlighting the role of regenerative endodontic procedures for the management of external root resorption.

Methods: a pediatric patient presented 24 hours after avulsion of a permanent tooth (which tooth?) and an associated alveolar fracture. Local anesthesia without vasoconstrictor was administered, the socket was irrigated with saline solution, and the avulsed tooth was replanted with a semi-rigid splint for 4 weeks. Systemic antibiotic therapy was prescribed, and tetanus prophylaxis was verified. Following the onset of external root resorption, regenerative endodontic therapy was initiated within the first week after replantation. Clinical and radiographic follow-up was performed at 6 and 12 months.

Results: six months after replantation and regenerative therapy, progression of external root resorption was evident, in the absence of symptoms and with good alveolar bone healing. At 12 months, the resorption remained unchanged, while bone preservation was satisfactory.

Conclusions: in delayed replantation of teeth with fully formed apices and external root resorption, the primary goal is not pulp regeneration but rather the management of periradicular inflammation and preservation of the alveolar bone for future rehabilitation. Regenerative endodontic treatment proved effective in managing post- replantation external root resorption.

DELAYED REPLANTATION OF AN AVULSED PERMANENT INCISOR IN A PEDIATRIC PATIENT: A 4-YEAR FOLLOW UP

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Aim: to describe the clinical management and long-term outcome of delayed replantation of an avulsed permanent maxillary central incisor in a pediatric patient.

Methods: an 8-year-old girl presented 24 hours after traumatic avulsion of tooth 1.1. Given the extended extraoral dry time and the presence of an open apex, an extraoral endodontic approach was performed without coronal access. The procedure included complete pulp removal, canal debridement, and shaping using manual and ultrasonic instrumentation. The root canal was then obturated with a bioceramic material. Subsequently, the tooth was replanted into the alveolus and stabilized with a flexible composite splint bonded to adjacent teeth. The splint was maintained for two weeks before removal. Clinical and radiographic follow-ups were scheduled to monitor healing and detect potential complications.

Results: clinical and radiographic follow-up demonstrated favorable healing outcomes. At the 4-year-follow-up, the replanted tooth showed clinical stability, absence of mobility, and satisfactory functional integration. No significant complications, such as root resorption or ankylosis, were detected.

Conclusions: delayed replantation, even after prolonged extraoral time, may represent a viable treatment option in pediatric patients. Appropriate extraoral endodontic management using bioceramic materials, combined with proper splinting, may support long-term tooth stability and function. This approach may be considered in selected cases to preserve alveolar bone and esthetics during growth.

MULTIDISCIPLINARY MANAGEMENT OF MOLAR-INCISOR HYPOMINERALIZATION (MIH): FROM REMINERALIZATION PROTOCOLS TO INTERCEPTIVE ORTHODONTICS

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Introduction: Molar Incisor Hypomineralization (MIH) is a systemic enamel defect affecting permanent first molars and incisors. Characterized by low mineral content and high protein levels, it leads to porous enamel, rapid post-eruptive breakdown, and severe hypersensitivity, significantly impacting a child's oral health and quality of life.

Aim: this report details the clinical management of a pediatric patient with MIH, from the initial diagnosis to a comprehensive, multidisciplinary treatment plan.

Materials and methods: a 9-year-old girl presented with posterior pain, thermal sensitivity, and white opacities. A dual-track approach was implemented:

- remineralization: application of Recaldent (CPP-ACP) and Fuji Triage (orange) to seal defects, provide fluoride release, and reduce chronic pain;
- orthodontics: use of a palatal expander and an Occluso-Guide appliance to correct malocclusions and guide dental alignment.

Results: the therapy successfully eliminated hypersensitivity and improved enamel aesthetics. Orthodontic progress was achieved in correcting the deep bite and molar relationship. Growing patient compliance was a decisive factor in the successful integration of all restorative and orthodontic devices.

Conclusions: managing MIH requires a personalized, multidisciplinary strategy. Early desensitization and interceptive orthodontics are essential to restore function and aesthetics. This case demonstrates that using innovative bioactive materials and professional updates are vital pillars of modern pediatric dentistry.

MANAGEMENT OF CLASS III USING AMCOP DEVICE IN PAEDIATRIC PATIENTS

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Aim: to evaluate the clinical effectiveness of the AMCOP® TC bioactivator in the interceptive treatment of dento-skeletal Class III malocclusion in growing patients.

Methods: eleven pediatric patients (5 males and 6 females), aged 6 to 12 years, diagnosed with Class III malocclusion, were retrospectively included in the study. All patients were treated with the AMCOP® TC elastodontic appliance. The protocol consisted of wearing the appliance for 2 hours in the afternoon and overnight during the first 6-8 months, followed by nighttime wear only. Lateral cephalometric radiographs were obtained at baseline (T0) and at the end of treatment (T1). Cephalometric data were analyzed using DeltaDent® software.

Results: treatment with the AMCOP® TC appliance was associated with an improvement in dento-skeletal Class III malocclusion. In addition, postural improvement of the cervical spine, particularly at the level of the first cervical vertebra, was observed. Four representative clinical cases supported the overall clinical findings.

Conclusions: within the limitations of this retrospective study and the small sample size, the AMCOP® TC elastodontic appliance appears to be a non-invasive and well-tolerated option for the interceptive treatment of dento-skeletal Class III malocclusion in growing patients. Further studies with larger samples are needed to confirm these preliminary findings.

FROM TRAUMA TO FUNCTION: A CONSERVATIVE APPROACH IN A PEDIATRIC CASE

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Mandibular condylar fractures are among the most frequent traumatic injuries in pediatric patients and represent a clinical challenge due to the anatomical complexity of the temporomandibular joint (TMJ) and the presence of active growth centers. If inadequately managed, these injuries may impair mandibular development, leading to long-term complications such as facial asymmetry, malocclusion, and TMJ dysfunction. The aim of this study is to evaluate the effectiveness of a conservative functional approach using elastodontic therapy in a growing patient with condylar fracture, focusing on functional recovery, occlusal balance, and condylar remodeling.

A 3-year-and-3-month-old patient was referred one week after craniofacial trauma, presenting with limited mouth opening, mandibular deviation, and occlusal imbalance. Cone Beam Computed Tomography (CBCT) revealed a medial fracture of the left condylar head with displacement.

Treatment consisted of an initial phase of assisted physiotherapy followed by the use of an elastodontic device (AMCOP bioactivator), primarily during nighttime.

Progressive clinical improvement was observed, including increased mandibular mobility, reduction of deviation, and restoration of occlusal stability. The functional approach supported physiological condylar remodeling and contributed to the recovery of normal mandibular function. Follow-up showed improved symmetry and stable functional outcomes.

Within the limitations of a single-case report, this study suggests that conservative functional management combining physiotherapy and elastodontic therapy represents a safe, minimally invasive, and growth-oriented strategy. Early intervention is essential to promote optimal functional and morphological outcomes.

USE OF THE RUBBER DAM IN PEDIATRIC SPECIAL NEEDS PATIENTS UNDER GENERAL ANESTHESIA: A CASE REPORT

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Aim: this clinical case aims to highlight the feasibility and benefits of using the rubber dam under general anesthesia, which would be impractical in an outpatient setting for a special needs non-compliant patient.
Methods: due to the patient's lack of cooperation, comprehensive dental treatment was performed in a single session under general anesthesia. Mouth props were utilized to maintain oral access. Restorative treatments were performed quadrant by quadrant, with the rubber dam successfully positioned on each element requiring treatment.
Results: the patient received all necessary restorative care in a single surgical session. The use of the rubber dam ensured excellent isolation of the operative field; a result that would be unachievable chairside for this patient. Furthermore, it optimized the visualization of the dental elements, mitigating the need for excessive and forced oral opening. It also provided an additional layer of airway protection against foreign bodies, a critical factor since the patient's protective reflexes are absent under general anesthesia.
Conclusions: all patients deserve the same quality of care and parity of therapeutic outcomes. The provision of restorative treatment under general anesthesia is essential to avoid an excessive number of extractions in patients unable to receive treatment in the chair. The application of a rubber dam for these patients during general anesthesia is a mandatory requirement to guarantee the same level of quality and operative isolation expected for cooperative outpatient populations.

DENTAL CARE ACCESS PROTOCOL IN THE OPERATING ROOM FOR PEDIATRIC PATIENTS WITH SPECIAL NEEDS: A CASE REPORT

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Aim: analysis of surgical setting protocol for a special needs non-collaborating pediatric patient, whose low collaboration precludes standard chairside dental treatment.
Methods: during the initial outpatient evaluation, once the impossibility of clinical cooperation and the presence of non-deferrable dental pathologies are confirmed, the patient is enrolled in the operating room access protocol. Once the informed consent has been signed by legal guardians, the procedure is scheduled in a day surgery setting, following a pre-anesthetic assessment.
Results: the procedure, performed under general anesthesia, enabled a comprehensive full-mouth oral rehabilitation in a single session. The therapeutic protocol included professional scaling for the management of soft tissue inflammation, conservative restorations of carious lesions, and extraction of dental elements with a hopeless prognosis.
Conclusions: the post-operative course has been characterized by mild pain symptoms during the first three days, consistent with the extent of the intraoperative dental treatments. After a full recovery from symptoms, a significant improvement in the patient's compliance during home-based oral hygiene procedures performed by the caregivers was observed.

PALATAL MELANOTIC MACULE IN A CHILD: DIAGNOSTIC CONSIDERATIONS AND A 3-YEAR FOLLOW-UP

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Aim: to report the clinical evolution of a solitary melanotic lesion of the hard palate in a child and to discuss differential diagnosis and management strategies in pediatric patients.
Methods: in 2023, a 3-year-old child presented with a solitary pigmented lesion on the left hard palate. The clinical diagnosis was suggestive of a melanocytic lesion. Differential diagnoses included oral melanotic macule, blue nevus, and, more rarely, melanoma. Given the absence of concerning clinical features and the patient's young age, a conservative management approach was adopted, consisting of periodic clinical and photographic follow-up rather than immediate biopsy.
Results: during follow-up, the lesion remained stable in size, color, and morphology. During three years of follow-up, a gradual reduction in pigmentation and size was observed, leading to partial spontaneous regression by 2026. No clinical signs suggestive of malignant transformation were detected throughout the observation period. Now that the patient is 6 years old, an excisional biopsy is scheduled.
Conclusions: in very young pediatric patients, solitary oral pigmented lesions with clearly benign clinical features may be managed conservatively, as surgical treatment may be challenging, with careful monitoring, in contrast with that in adults, in whom biopsy is indicated. This case suggests that a non-invasive management approach may be appropriate in selected cases, especially in very young children; however, it remains necessary to proceed with biopsy as soon as possible.

ORAL MANIFESTATIONS IN A PEDIATRIC PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS, LUPUS NEPHRITIS, AND HYPERCOAGULABILITY: IMPLICATIONS FOR DENTAL CARE

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Aim: Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disease with multisystem involvement. In pediatric patients, oral lesions may reflect disease activity and be influenced by current immunosuppressive therapy.
Methods: a 9-year-old female with SLE, lupus nephritis, and hypercoagulability state was referred to the U.O.C. of General Pediatrics for follow-up evaluation. Medical history included central nervous system involvement and recurrent Herpes Zoster infections. The patient was receiving mycophenolate mofetil, prednisone, hydroxychloroquine, and antiplatelet therapy. A clinical and interdisciplinary assessment was performed.
Results: the patient was in good general condition and presented with malar rash and conjunctival hyperemia. Intraoral examination revealed gingivitis, multiple carious lesions in primary dentition, and an erythematous lesion with central ulceration on the hard palate. Initial management with 0.12% chlorhexidine mouthwash was prescribed. At follow-up, the lesion persisted, showing reduced erythema but increased erosive-ulcerative area. Topical clobetasol propionate gel twice daily was initiated. After two weeks, complete resolution of the erosive-ulcerative component was observed, with persistence of mild erythema. The patient was subsequently referred to a Pediatric Dentistry Unit.
Conclusions: oral lesions in pediatric SLE may show variable clinical evolution and partial response to topical corticosteroids, supporting a likely immune-mediated origin. Early recognition and multidisciplinary management are essential to ensure appropriate diagnosis and safe dental care.

ODONTOSTOMATOLOGICAL ASPECTS OF CHARGE SYNDROME: A CASE REPORT

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Aim: this study aims to describe the main dental features observed in a 14-year-old patient with CHARGE syndrome, highlighting clinical implications and management challenges to support a multidisciplinary therapeutic approach.
Methods: a clinical case was analyzed through the collection of medical history, clinical, and radiographic data. The evaluation included intraoral examination, assessment of dental anomalies, and craniofacial development, with comparison to the existing literature. Patient compliance and the need for tailored management strategies were also considered.
Results: findings were consistent with the literature regarding systemic and genetic features, although individual variability in the odontostomatognathic region was observed. No abnormalities in tooth number or morphology were detected. However, signs of bruxism and dental wear, particularly in the anterior region, were present.
The patient exhibited Class III malocclusion, anterior crossbite, and functional impairment. Oral breathing and unilateral facial muscle hypotonia, associated with facial nerve paralysis, were also observed.
Conclusions: CHARGE syndrome does not appear to be associated with specific pathognomonic dental alterations. However, reduced quality of life and poor compliance may contribute to the deterioration of oral health.
Although standardized protocols for early diagnosis and management are currently lacking, their development is essential to prevent severe oral disease and improve patient outcomes.

THE DENTIST'S ROLE IN X-LINKED HYPOPHOSPHATEMIA: A CASE REPORT

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Aim: X-linked hypophosphatemia (XLH), caused by PHEX mutations, leads to dentin hypomineralization, enlarged pulp chambers, and extended pulp horns, predisposing even healthy teeth to pulpal necrosis and abscesses. This report presents a 9-year-old patient with an 8-year follow-up, highlighting oral manifestations of XLH and the role of the paediatric dentist in diagnosis and management.
Methods: a female patient with genetically confirmed XLH (two heterozygous PHEX variants: c.248T>C in exon 3, c.1202C>T in exon 11) was followed at ages 9 and 17. She has been under care since 2017 at Ospedale Infantile Regina Margherita and Paediatric Dentistry Service, Dental School (Turin), and her private dentist. Periodic clinical and radiographic exams assessed dental features and complications.
Results: at 9 years, while on conventional XLH therapy, the patient had mixed dentition without carious or osseous lesions but exhibited malocclusion. She underwent regular dental check-ups and orthodontic treatment. By 17 years, conventional therapy was discontinued in February 2024 and subcutaneous burosumab was initiated. Clinical assessment revealed intact caries and periodontal status, oral hygiene requiring improvement, and osseous lesions with necrosis affecting teeth 2.1, 3.1, and 4.1, which were managed endodontically.
Conclusions: long-term follow-up highlights the importance of monitoring and preventive care in XLH. Paediatric dentists are essential for early detection and management of oral complications. Dedicated guidelines and further research on XLH dental effects are needed.

ORAL MANIFESTATIONS OF CLEIDOCRANIAL DYSOSTOSIS: A CASE REPORT

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Aim: cleidocranial dysplasia is a genetically determined disorder characterized by multiple abnormalities of bone development, including supernumerary teeth, failure of eruption of permanent dentition, clavicular hypoplasia, short stature, and delayed exfoliation of deciduous teeth. The aim of this study is to describe a pediatric case, with particular attention to the clinical presentation and diagnostic approach.

Methods: a 13-year-old male with cleidocranial dysostosis was referred to the Pediatric Dentistry Unit of Giovanni XXIII Hospital in Bari. Clinical evaluation revealed retained deciduous teeth, seven supernumerary teeth in the maxillary arch, a lesion in region 4.5, and a right mandibular radiolucent lesion involving tooth 4.7, associated with displacement of the inferior alveolar nerve and discontinuity of the lingual cortex. Under general anesthesia, a mucoperiosteal flap was raised; tooth 4.7 was extracted together with the lesion. Cavity debridement with piezoelectric instruments, hemostasis, suturing, and histological examination were performed.

Results: follow-up demonstrated satisfactory healing, bone regeneration, and preservation of inferior alveolar nerve function. Histological findings were consistent with a follicular cyst and a compound odontoma.

Conclusions: favorable clinical and radiological outcomes were observed, with preservation of nerve sensitivity. Early diagnosis and genetic counseling are essential to identify hereditary patterns and guide appropriate management.

MULTIDISCIPLINARY CRANIOFACIAL AND SLEEP-DISORDERED BREATHING RISK ASSESSMENT OF A PEDIATRIC PATIENT WITH GORLIN-GOLTZ SYNDROME: A CASE REPORT

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Aim: to describe the craniofacial, odontogenic, and sleep-related findings in a pediatric patient with Gorlin-Goltz syndrome and emphasize the orthodontic role in identifying risk factors for sleep-disordered breathing (SDB).

Methods: a 12-year-old male with Gorlin-Goltz syndrome underwent multidisciplinary evaluation. Dental and orthodontic assessment included intraoral examination, photographic documentation, and digital intraoral scanning to analyze craniofacial morphology and occlusion. Medical records related to recurrent odontogenic cysts were reviewed. SDB risk was screened using the Pediatric Sleep Questionnaire (PSQ).

Results: the patient showed multiple recurrent odontogenic cysts in both jaws, leading to repeated surgeries and extraction of impacted teeth. Orthodontic analysis revealed an orthognathic skeletal pattern with midline deviation, lateral open bite, and Class II canine relationship. Digital imaging documented craniofacial asymmetry and dental anomalies. The PSQ score exceeded the diagnostic threshold (>0.33), indicating high risk of obstructive sleep apnea.

Conclusions: this case illustrates the complex craniofacial and odontogenic features of Gorlin-Goltz syndrome and their potential impact on airway function. Orthodontic assessment can aid early detection of craniofacial risk factors for SDB. A multidisciplinary, longitudinal follow-up is essential for diagnosis, monitoring, and functional management in pediatric patients with this condition.

ODONTOMA-ASSOCIATED IMPACTION OF A MAXILLARY CENTRAL INCISOR IN A PATIENT WITH IPSILATERAL LATERAL INCISOR AGENESIS

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Aim: the aim of this case report is to evaluate the eruptive outcome of an impacted maxillary left central incisor following surgical removal of an odontoma that was obstructing its eruption in a 9-year-old male patient with agenesis of the ipsilateral lateral incisor.
Methods: a 9-year-old patient underwent clinical and radiographic evaluation at the Pediatric Dentistry Department of the University of Naples Federico II. A panoramic radiograph revealed a radiopaque lesion consistent with an odontoma, acting as a mechanical barrier for the eruption of element 2.1. Radiographic exams confirmed the agenesis of element 2.2, while 2.3 was correctly positioned. In July 2025, surgical removal of the odontoma was performed to clear the eruptive pathway for the impacted central incisor.
Results: the surgical procedure was successful. Following an 8-month follow-up period, a slight radiographic improvement in the position of tooth 2.1 was observed; however, this progress was not considered clinically significant, as the tooth failed to reach the occlusal plane spontaneously.
Conclusions: although early removal of an odontoma is essential to eliminate eruptive interference, spontaneous eruption is not always guaranteed. In this case, the limited eruptive progress of tooth 2.1, combined with agenesis of element 2.2, suggests the need for a combined surgical-orthodontic approach to achieve an aesthetic and functional outcome.

MULTIDISCIPLINARY APPROACH IN THE TREATMENT OF MAXILLARY CENTRAL INCISOR IMPACTION CAUSED BY TWO SUPERNUMERARY TEETH: A CASE REPORT

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Aim: Supernumerary teeth (ST) are odontogenic structures exceeding the normal dental formula for a given arch region. Their precise etiology remains unclear, with proposed theories including atavism, dichotomy, and dental lamina hyperactivity. ST can lead to crowding, diastema, delayed or ectopic eruption, root resorption, and dentigerous cyst formation. This case report describes the multidisciplinary management of two ST responsible for upper right central incisor impaction.
Methods: an 8-year-old non-syndromic boy presented with absence of the upper right central incisor. OPG and CBCT revealed two anterior maxillary ST. Under local anesthesia, a full-thickness palatal flap (1.4-2.4) enabled surgical removal of the ST and flap resuturing. Quad Helix maxillary expansion addressed the right crossbite. After 10 months without spontaneous eruption, a vestibular repositioning flap exposed the crown for orthodontic bonding. Fixed appliance therapy completed repositioning. A Hawley retainer was worn nightly for 6 months.
Results: the combined surgical-orthodontic treatment achieved aesthetically balanced occlusion with satisfactory overjet and overbite, and proper alignment of the upper anterior dentition.
Conclusions: early diagnosis of ST is crucial to prevent severe complications including dentigerous cysts, root resorption, and bone loss. A multidisciplinary treatment approach is strongly recommended for optimal preservation of hard and soft tissues.

EVALUATION OF CRANIOFACIAL AND ORAL ANOMALIES IN GROWING PATIENTS WITH MARFAN SYNDROME

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Aim: Marfan syndrome is a hereditary connective tissue disorder with multisystem involvement, frequently affecting craniofacial and oral development during growth.

Methods: a longitudinal clinical case was analyzed in a patient diagnosed with Marfan syndrome, followed from 5 to 14 years of age. Clinical evaluation included medical history, intraoral examination, occlusal assessment, radiographic analysis, and periodontal and gnathological evaluation. Findings were compared with the existing literature.

Results: the patient exhibited features partially consistent with those reported in the literature, including a high-arched palate, posterior crossbite, and dental agenesis. No significant structural dental anomalies or clinically relevant periodontal impairment were observed.

Although previous studies have suggested an increased susceptibility to periodontal disease due to fibrillin-1 defects affecting connective tissue integrity, such alterations were not evident in this case, indicating possible phenotypic variability among affected individuals.

Conclusions: these findings suggest that periodontal involvement in Marfan syndrome is not consistent. Therefore, long-term monitoring is essential, even in the absence of evident clinical signs. A multidisciplinary and individualized approach is recommended, with particular attention to periodontal prevention and the careful application of orthodontic forces to preserve tissue health and ensure long-term treatment stability.

THE IMPACT OF VR HEADSETS ON ANXIETY REDUCTION IN PAEDIATRIC DENTISTRY

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Aim: to evaluate the effectiveness of innovative devices such as the Meta Quest 3 virtual reality headset and augmented reality in reducing anxiety in paediatric patients, as measured by the VAS scale.

Methods: fifty-four paediatric patients were divided into two crossover groups and underwent dental treatment using a VR headset. Older patients were immersed in naturalistic scenarios, while younger ones were exposed to cartoon content. The VAS scale was used to measure and record their anxiety levels after the procedure.

Results: the use of virtual reality proved effective in reducing anxiety and increasing patient cooperation during dental procedures. From a clinical perspective, VR helped overcome past traumatic experiences and prevent the development of new anxiety related to dental treatments, facilitating timely interventions and reducing procedure time. This technique improved treatment efficiency and promoted greater patient engagement.

Conclusions: the use of VR headsets appears to be a valid option for interacting with paediatric patients. However, it cannot always be used due to exclusion criteria identified during medical history assessment, such as severe visual or hearing impairments that may hinder its use. Its integration into dental practice can improve patient cooperation and engagement.

EVALUATION OF STRESS REDUCTION THROUGH ANIMAL-ASSISTED THERAPY IN PEDIATRIC DENTAL PATIENTS

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Objective: Animal-Assisted Therapy (AAT) is adopted in pediatric healthcare as a supportive strategy to reduce anxiety and improve patient cooperation, particularly in potentially stressful environments. In this context, the present randomized clinical trial aimed to evaluate the effect of AAT on stress perception in pediatric dental patients using both objective and subjective measures.

Material and methods: 42 children aged 6-13 years were consecutively enrolled at the Department of Pediatric Dentistry, C.I.R. Dental School, and randomly divided into two groups: AAT (test) and no AAT (control). Each patient underwent four saliva collections (baseline, morning, pre- and post-treatment). Salivary cortisol and alpha-amylase levels were measured using ELISA. Subjective stress was assessed using a modified Wong-Baker visual analog scale (VAS). Statistical analysis was performed using IBM SPSS Statistics, with salivary cortisol variation as the primary outcome. Post-hoc analyses (Tukey/Dunn), Wilcoxon test for VAS, and Bonferroni correction were applied, with $p < 0.05$ considered significant.

Results: salivary alpha-amylase showed a significant increase at T2 in the control group ($p = 0.001$), with an overall significant temporal variation ($p < 0.001$), whereas no significant changes were observed in the AAT group ($p = 0.815$). Cortisol levels decreased over time in both groups, reaching statistical significance at T2 ($p = 0.035$) and T3 ($p = 0.021$). Subjective stress (VAS) also significantly decreased after treatment in both groups (test: $p = 0.020$; control: $p = 0.005$), with no significant differences between groups.

Conclusions: AAT appears to be a promising adjunctive approach to modulate physiological stress in pediatric dental patients. Biomarker trends suggest a beneficial effect on stress response, although further studies are needed.

AIR-ABRASION EFFECT ON FISSURE SEALING PERFORMED WITH SELF-ADHESIVE *VS* ADHESIVE RESIN SEALANTS IN PEDIATRIC PATIENTS: A CLINICAL STUDY

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Aim: the aim of this *in vivo* study is to evaluate the influence of enamel surface preparation (air-abrasion with or without enameloplasty) and sealant type (self-adhesive *vs* adhesive) on marginal adaptation, retention, and short-term clinical performance.

Materials and methods: a randomized split-mouth clinical trial was conducted on 51 pediatric patients (aged 6-8 and 12-14 years), for a total of 200 permanent molars. Teeth were assigned to four groups based on preparation technique (air-abrasion ± enameloplasty with acid etching) and sealant type. At 3-month follow-up, marginal adaptation, retention, secondary caries, surface roughness, and marginal discoloration were assessed. Optical Coherence Tomography (OCT) supported clinical evaluation.

Results: groups with enameloplasty showed optimal marginal adaptation (100% Alpha score) and no secondary caries. Self-adhesive sealants with enameloplasty showed the best performance, with smoother surfaces, minimal discoloration, and complete retention (100%). Groups without enameloplasty showed lower adaptation, higher caries incidence, and reduced retention. OCT showed no microleakage; minor defects (e.g., air bubbles) were occasionally observed without clinical relevance.

Conclusions: mechanical enamel conditioning, especially air-abrasion with enameloplasty, improves fissure sealant performance. On well-prepared surfaces, self-adhesive sealants are a reliable option, with superior short-term outcomes in marginal adaptation and retention. However, this study is limited by short follow-up (3 months) and small sample size. Further long-term studies with larger cohorts and novel materials (e.g., bioactive sealants) are needed to confirm these findings.

CLOWN THERAPY FOR ENHANCING COOPERATION IN CHILDREN WITH AUTISM DURING DENTAL VISITS: A RANDOMIZED CONTROLLED TRIAL

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Aim: Clown therapy is commonly used in healthcare settings to reduce anxiety and improve cooperation among pediatric patients. This study aimed to evaluate the effectiveness of familiarization sessions using clown therapy in improving cooperation during dental visits in children with autism.

Materials and methods: a randomized controlled trial was conducted on 42 non-cooperative children (6-14 years) with autism, recruited during first dental visit. Patients were randomly assigned into two groups: control group (n = 21) performed by the dentist alone, and clown group (n = 21) performed by dentist and two professional clowns. Each child attended three familiarization sessions, aimed at completing eight steps related to dental examination (entering the room, sitting and lying on the dental chair, tolerating the light, opening the mouth, tolerating gloves, dental mirror and probe). Data were analyzed using non-parametric tests (Wilcoxon signed-rank and Mann-Whitney U test).

Results: both groups showed significant improvement during the three sessions. In the control group, differences were significant between baseline and subsequent sessions, but not between the second and third. In the clown group, all comparisons were significant ($p < 0.05$). No differences between groups were found up to T2, while at T3 the clown group showed a higher number of completed steps ($p = 0.0049$).

Conclusions: Clown therapy appears to be a useful support to improve cooperation in children with autism during dental visits. Although the effect was not immediate, better outcomes were observed over time, suggesting a positive role in behavioral adaptation.

COMPARISON OF TRIPLE ANTIBIOTIC PASTE *VERSUS* CALCIUM HYDROXIDE-IODOFORM PASTE FOR ROOT CANAL FILLING IN NECROTIC PRIMARY MOLARS: A RANDOMIZED CLINICAL TRIAL

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Aim: to compare the clinical and radiographic effectiveness of triple antibiotic paste (TAP) *versus* calcium hydroxide-iodoform paste in pulpectomy of necrotic primary molars. TAP use is derived from regenerative endodontic protocols in immature permanent teeth.

Methods: children aged 4-9 years with at least one necrotic primary molar indicated for pulpectomy were enrolled. Teeth with >1/3 root resorption or non-restorable crowns were excluded. Eligible teeth were randomized to TAP (test) or calcium hydroxide-iodoform (control). Treatments were performed in two visits following a standardized protocol. A calibrated blinded examiner conducted clinical assessments. Follow-ups were scheduled at 1, 3, 6, and 12 months. Primary outcome was clinical healing (absence of pain, fistula, abscess, or suppuration); secondary outcome was radiographic healing assessed by Periapical Index (PAI). Statistical analysis included Cochran's Q, Fisher's exact test, McNemar test, and non-parametric tests (Mann-Whitney U, median test), with $p < 0.05$.

Results: 37 molars were treated (19 TAP, 18 control), with comparable baseline characteristics. Both groups showed significant pain reduction ($p < 0.001$). After 1 month, clinical success rates were similar (88.2% TAP *vs* 87.5% control), reaching 100% at 3 months. No significant intergroup differences were found. Mean PAI scores decreased in both groups from baseline to 3 months (TAP: 3.53 ± 0.96 to 2.75 ± 0.87; control: 3.22 ± 1.11 to 2.43 ± 0.85), without significant differences.

Conclusions: within the limits of this preliminary analysis, TAP demonstrated comparable short-term clinical and radiographic outcomes to calcium hydroxide-iodoform, with potential procedural advantages. Longer follow-up is needed to confirm TAP role as a simplified and biologically sound alternative in primary molar endodontics.

ASSESSMENT OF PERCEIVED PAIN FOLLOWING THE ADMINISTRATION OF A LOCAL ANESTHETIC USING THE C-CLAD SYSTEM IN DENTAL TOOTHS AFFECTED BY PULPITIS IN PEDIATRIC DENTISTRY: A PILOT STUDY

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Aim: Computer-controlled local anesthesia (C-CLAD) systems have been introduced with the aim of improving patients' acceptance of dental treatments by minimizing pain perception and reducing anxiety associated with dental procedures. The aim of this study is to assess the effectiveness of C-CLAD systems by comparing their performance with that of conventional anesthetic techniques in pediatric dentistry.

Methods: fifty patients (age range between 6 -12 years) from the Hospital G. Eastman, Unit of Pediatric dentistry Rome, underwent conservative therapy are selected for the study. The teeth selected after conclusion of routine conservative dental procedures are allocated to three different groups differentiated by the method of anesthesia: Loco regional block nerve; Intraligamentary Anesthesia; Single tooth anesthesia through Computer - Controlled Local Anesthetic Delivery (C-CLAD). The efficiency of anesthetic procedure was evaluated in accordance with standard clinical practice, through pulp test at baseline, T1 = 60 sec and T2 = 5 minutes. The pain's perception is measured through Visual Analogue Scale. The questionnaire will be administered at the conclusion of routine conservative dental treatments.

Results: the results obtained show that the probability that teeth are anesthetized at T1 is expected to be higher among patients with computer-based anesthesia. Among teeth not asleep at T1, Traditional anesthesia ranks at the first place in terms of probability that teeth are asleep at T2. The VAS score was significantly lower in the C-CLAD group compared to others.

Conclusions: our results suggest that computer-controlled anesthesia is an effective technique which generate lower levels of pain perceptions among subjects. These results are important to promote the so-called process of empowerment of patients in dental care.

INTEGRATED CLINICAL PROTOCOL FOR THE DIAGNOSIS AND TREATMENT OF MALOCCLUSIONS IN GROWING PATIENTS

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Aim: this study aims to evaluate growing patients with malocclusion and postural imbalances through a combined orthodontic and postural assessment. The goal is to implement orthodontic treatment within an integrated neuromyofascial rehabilitation framework. Within this interdisciplinary protocol, the physical therapist optimizes soft tissue conditions to facilitate the orthodontic pathway and enhance overall treatment efficacy. The stomatognathic system is approached as a single functional unit, working in synergy to achieve and maintain homeostatic balance.

Methods: observational pilot study. Approximately 40 subjects (aged 7-13 years) with malocclusion and cranio-vertebral dysfunction will be enrolled. Inclusion criteria: subjects affected by malocclusion and postural dysfunction undergoing standard interceptive orthodontic treatment plus physical therapy, following a postural assessment. Clinical, radiographic, and postural evaluations are scheduled at baseline (T0), at 3 months (T1), and at 6 months (T2). Exclusion Criteria: Absence of malocclusion and postural anomalies.

Expected results: It is hypothesized that the integration of postural and myofunctional rehabilitation enhances the stability of orthodontic treatment outcomes alone and improves cranio-vertebral alignment.

Conclusions: the results of this study will clarify the role of postural integration in orthodontic success. If confirmed, these findings will advocate for the implementation of combined myofunctional and postural protocols as a standard of care to optimize musculoskeletal health and long-term stability in growing patients.

ARTIFICIAL INTELLIGENCE IN THE INTERPRETATION OF PANORAMIC RADIOGRAPHS IN PEDIATRIC PATIENTS DURING MIXED DENTITION: A PRELIMINARY STUDY ON CLINICAL PERFORMANCE, LIMITATIONS, AND MEDICO-LEGAL IMPLICATIONS

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Aim: this preliminary study evaluated the diagnostic performance and clinical utility of artificial intelligence (AI) systems in interpreting panoramic radiographs of pediatric patients during mixed dentition. A secondary aim was to assess agreement between two AI-based software programs (Diagnocat and Allisone) and specialist interpretation, and to explore possible judicial implications of their clinical use.

Methods: a retrospective observational study was conducted on 200 panoramic radiographs obtained for diagnostic purposes from pediatric patients in mixed dentition. Images were analyzed with Diagnocat and Allisone and compared with specialist interpretation as the reference standard. Evaluation included tooth detection and labeling, agenesis, supernumerary teeth, ectopic eruption, inclusion, root resorption, and developmental anomalies. Concordance, discrepancy type, false positives, and false negatives were recorded. Judicial aspects were explored by analyzing diagnostic discrepancies, the need for clinician validation, and issues of responsibility.

Results: preliminary analysis showed good agreement for basic tasks such as tooth detection and labeling. Lower concordance emerged in more complex conditions typical of mixed dentition, including eruptive disturbances, inclusion, and early developmental anomalies. False positive and false negative findings were observed, requiring systematic clinician validation before final diagnosis.

Conclusions: AI may be a useful support tool for interpreting pediatric panoramic radiographs, especially for structured tasks. However, performance decreases in the more complex mixed dentition setting. These findings support AI as a decision-support system under strict clinical supervision, with clear documentation of discrepancies and defined medical liability.

ENVIRONMENTAL DETERMINANTS AND MIH: QUESTIONNAIRE-BASED INVESTIGATION OF PRENATAL, PERINATAL AND POST-NATAL FACTORS IN A PEDIATRIC POPULATION OF CENTRAL ITALY

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Aim: the aim of the present preliminary study was to evaluate the clinical characteristics of Molar Incisor Hypomineralization (MIH) in a pediatric population from central Italy, analyzing the effect of pre-natal, peri-natal and post-natal factors.

Methods: pediatric patients (<14 years) presenting MIH underwent first visit at Complex Care Unit of Pediatric Dentistry – University Hospital Policlinico Umberto I of Rome, and were asked to complete a questionnaire regarding clinical aspects. Moreover, mothers of the same subjects completed a questionnaire concerning pre-natal, peri-natal and post-natal information.

Results: a total of 18 children (M:F = 10:8, mean age: 8.56 ± 1.48) were preliminary enrolled in the present study. Pain perception was highly reported in contact with cold (94.4%) and air exposure (83.3%). Additionally, 50% of participants reported pain during toothbrushing. Regarding pre-natal factors, antibiotics intake, episodes of prolonged vomiting and stressful conditions during pregnancy were relatively frequent. Moreover, critical events at birth seemed to potentially interfere with enamel development in incisors and molars. Concerning post-natal determinants, recurrent respiratory infections, antibiotic and corticosteroids use and systemic diseases in the first years of life represent potential risk factors.

Conclusions: the obtained outcomes strengthen the multifactorial hypothesis of MIH etiopathogenesis. The impairment in quality of life and the aesthetic-related psychological discomfort highlight the significant impact of MIH on the child's well-being.

IN VIVO OCT EVALUATION OF EARLY CARIES REMINERALIZATION AFTER FLUORIDE VARNISH APPLICATION: A PILOT STUDY

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Aim: to evaluate the effect of fluoride varnishes on early non-cavitated carious lesions (ICDAS 1-2) using Optical Coherence Tomography (OCT), focusing on enamel microstructural changes.

Methods: pediatric patients with ICDAS 1-2 lesions were included. OCT scans were obtained at baseline (T0) and after one month (T1). Qualitative analysis considered enamel surface, attenuation profile, subsurface optical features, optical texture, and dentino-enamel junction (DEJ) continuity. Parameters were assessed by comparing healthy enamel and 1-2 ICDAS lesions. Teeth were treated with Duraphat® (5% NaF) or Clinpro™ Varnish (5% NaF + tricalcium phosphate).

Results: a total of 28 teeth were analyzed (14 Clinpro™, 14 Duraphat®). At T0, OCT showed surface irregularities, heterogeneous attenuation, subsurface hypo-reflective areas, altered optical texture, and reduced DEJ definition. At T1, improvement was observed in 24/28 teeth: 13/14 Clinpro™ (92.9%) and 11/14 Duraphat® (78.6%), with increased surface regularity, more homogeneous attenuation, reduction of hypo-reflective areas, improved optical texture, and better DEJ continuity. Clinpro™ showed more consistent changes, with patterns approaching healthy enamel, whereas Duraphat® showed more variable and mainly partial recovery. No lesion progression was observed.

Conclusions: OCT is a reliable non-invasive tool for monitoring early caries. Fluoride varnishes promote enamel microstructural improvement, with Clinpro™ showing a more consistent and pronounced effect.

MORPHOLOGICAL AND MICROSTRUCTURAL CHARACTERIZATION OF ARTIFICIALLY CARIOUS DENTIN TREATED BY CHEMOMECHANICAL REMOVAL

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Aim: chemomechanical caries removal allows selective elimination of infected tissue and may improve patient comfort; however, the properties of residual dentin remain poorly characterized.

The aim of the study was to compare conventional and chemomechanical caries removal methods, evaluating residual dentin in chemical, morphological, and microstructural terms.

Methods: thirty extracted sound human molars were selected and divided into three groups: untreated artificial caries (control), conventional removal using a low-speed round bur, and chemomechanical removal using a papain-based gel (Brix 3000). Dentin surfaces were analyzed by laser fluorescence (Diagnodent), 3D optical profilometry, and scanning electron microscopy (SEM) with EDX analysis.

Results: the Brix 3000-treated group showed reduced fluorescence values, intermediate surface roughness closer to that of sound dentin, compared to the conventional technique, which produced more irregular surfaces. SEM analysis revealed greater opening of dentinal tubules and reduced smear layer with the chemomechanical method. EDX analyses confirmed Ca/P ratios comparable to sound dentin in the treated groups, unlike the demineralized control, supporting the effectiveness of both treatments.

Conclusions: chemomechanical removal proved to be effective and less invasive than the conventional technique, preserving healthy dentin and providing favorable morphological features for restorative adhesion. However, further *in vivo* studies are needed to confirm the clinical relevance of these findings.

FLUORIDE RELEASE FROM PEDIATRIC DENTAL RESTORATIVE MATERIALS UNDER DIFFERENT PH AND TEMPERATURE CONDITIONS: AN *IN VITRO* STUDY

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Aim: to evaluate fluoride release from three pediatric restorative materials under different pH and temperature conditions and to determine how environmental factors influence their bioactive behavior in caries-prone conditions.

Methods: specimens (10 mm × 2 mm; n = 3 per material) of *Riva Light Cure HV, Fuji IX GP Fast*, and *Cention Forte Filling Material* were prepared according to manufacturers' instructions. Samples were immersed in buffer solutions at pH 4.8, 6.8, and 8.8 and stored at 37 °C and 44 °C to simulate clinically relevant intraoral conditions. Fluoride release was quantified using ion chromatography at 1, 7, and 28 days. Data were analyzed using mixed-effects models ($p < 0.05$).

Results: fluoride release was significantly influenced by pH, temperature, and exposure time ($p < 0.05$). *Riva Light Cure* HV exhibited the highest fluoride release, particularly under acidic conditions (pH 4.8) at 44 °C, reaching 40.14 mg/L after 28 days. *Cention Forte Filling Material* showed a progressive increase over time, especially in alkaline environments, whereas *Fuji IX GP* Fast demonstrated lower cumulative values. Elevated temperature enhanced fluoride diffusion across all materials. The null hypothesis was rejected.

Conclusions: environmental pH and temperature significantly affect fluoride release dynamics in pediatric restorative materials. *Riva Light Cure HV* demonstrated superior ion release under acidic stress, suggesting potential advantages for high-caries-risk pediatric patients. Material selection should integrate mechanical performance with sustained bioactive potential.

DAILY SECRETION RATE (DSR), ENAMEL EXTENSION RATE (EER) OF DENTAL ENAMEL AND CROWN FORMATION TIME (CFT) IN CHILDREN WITH CELIAC DISEASE STUDIED BY HISTOMORPHOMETRIC TECHNIQUES

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Aim: the study of human deciduous teeth provides a valuable tool to investigate and reconstruct late prenatal and early postnatal life. This study aimed to evaluate growth in celiac infants, using dental growth parameters as proxies, in a sample of primary second molars (dm2), and to compare these findings with published data from non-celiac controls.

Methods: non-demineralized dm2 (n = 9) were sectioned following standard dental histological protocols. Thin sections were examined under polarized and phase-contrast light microscopy to quantify enamel Daily Secretion Rates (DSRs), Enamel Extension Rates (EERs), and Crown Formation Times (CFTs). The data obtained were compared to the same parameters provided by scientific literature.

Results: in the analyzed cohort, 7 out of 9 patients were below the expected growth percentiles at birth, at the time of diagnosis, and during the first year of life. Despite these growth impairments, the enamel growth parameters (DSR, EER, and CFT) assessed in dm2 from celiac children were comparable to those reported in the literature for the same dental class in non-celiac controls.

Conclusions: this preliminary study suggests that, although celiac disease is associated with aired somatic growth, it does not appear to affect dental growth.

Further study should be conducted to confirm these outcomes.

MOLAR-INCISOR HYPOMINERALIZATION: FROM ETIOLOGY TO STRUCTURAL, CHEMICAL, AND MECHANICAL CHARACTERIZATION OF AFFECTED ENAMEL

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Aim: molar-incisor hypomineralization is an enamel defect characterized by weakness and hypersensitivity, with unclear etiology. This study investigated etiological factors, clinical expression, and the structural, chemical, and mechanical properties of affected enamel in a pediatric cohort.

Methods: patients aged 6-18 years diagnosed with MIH at the Pediatric Dentistry Unit of the University of Turin were clinically evaluated. Questionnaires assessed pre-, peri-, and postnatal factors and quality of life. Extracted MIH-affected teeth were analyzed using scanning electron microscopy, Raman spectroscopy, and nanoindentation to evaluate ultrastructure, chemical composition, and mechanical properties. Statistical analyses included one-way ANOVA and Pearson Chi-square test ($p < 0.05$).

Results: severe MIH lesions were significantly associated with hypersensitivity ($p < 0.05$). Questionnaire data ($n = 65$) showed limited association with prenatal and perinatal factors, while early postnatal events — particularly systemic infections, fever, and corticosteroid use — were more frequently reported. SEM revealed disorganized prism architecture and increased porosity. Raman spectroscopy showed significant alterations in the mineral-to-matrix ratio ($p < 0.05$), while nanoindentation demonstrated reduced hardness and elastic modulus compared with sound enamel ($p < 0.05$).

Conclusions: MIH is a multifactorial condition associated with early-life systemic factors and significant enamel alterations, highlighting the need for tailored preventive and restorative strategies.

Funded by PNRR M4C2 PRIN M.E.T.A.D.E.N.T.I, EU Next Generation (MUR 20222YTC5A; CUP D53D23007740006).

EFFECT OF DIFFERENT TECHNIQUES AND MATERIALS ON THE SEALING ABILITY OF DENTAL FISSURES: AN OCT STUDY

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Aim: to evaluate, *in vitro*, the effect of different enamel surface preparation techniques and sealant types (self-adhesive *vs* adhesive) on marginal adaptation and microleakage using Optical Coherence Tomography (OCT).

Methods: forty extracted molars were randomly assigned to four experimental groups based on surface preparation (air-abrasion with or without selective enameloplasty) and sealant type. OCT analysis was performed at baseline, after application, and after thermocycling (5000 cycles, 5-55°C). Interfacial gaps, indicative of microleakage, were assessed and analyzed using one-way ANOVA ($p < 0.05$).

Results: OCT analysis revealed the presence of interfacial gaps and structural defects. No significant differences were found among groups at baseline ($p = 0.42$) or after thermocycling ($p = 0.48$). None of the tested combinations showed a significant increase in microleakage following thermal aging.

Conclusions: all sealants showed comparable marginal integrity and resistance to thermal aging, regardless of the surface preparation protocol. Further studies with extended aging protocols are needed to better evaluate long-term stability.

ACCENTUATED LINES IN DECIDUOUS SECOND MOLARS AS INDICATORS OF NUTRITIONAL MALABSORPTION IN CHILDREN WITH CELIAC DISEASE: A PILOT STUDY

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Aim: teeth serve as retrospective archives of physiological stress during development. Stress exceeding a specific threshold leaves permanent markers in the dental enamel known as accentuated lines (ALs). The objective of this study was to determine the prevalence and age of onset of ALs in the primary second molars of pediatric patients diagnosed with celiac disease and documented medical history, in comparison to a healthy control group.

Methods: a total of 9 primary second molars (dm2) were obtained by pediatric celiac patient referred to Complex Care Unit of Pediatric Dentistry – University Hospital Policlinico Umberto I of Rome. Thin sections of the teeth were prepared according to the NOWA protocol and examined under light microscopy and polarized light microscopy to identify the neonatal line (NNL) - serving as a birth marker - and ALs. Odontochronologies were reconstructed by analyzing both short- and long-period enamel incremental markers.

Results: the prevalence of ALs in pediatric celiac patients is found to be higher than that observed in the healthy control group. In the whole celiac sample stress-related ALs consistently align with the weaning onset - around 6 months of age - or with the first contact with gluten as documented in the patients' medical records.

Conclusions: nutrient malabsorption caused by celiac disease seems to leave permanent markers in the developing tooth through the formation of ALs. These findings suggest that the introduction of gluten during the weaning phase might trigger physiological stress severe enough to disrupt ameloblast activity.

COMPARATIVE IMPACT OF MANUAL, ELECTRIC AND SONIC TOOTHBRUSHING ON THE RETENTION AND SURFACE QUALITY OF RESIN-BASED SEALANTS

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Aim: fissure sealants are an established approach for preventing occlusal caries in children, yet their long-term effectiveness relies on adequate mechanical durability. Although toothbrush performance in plaque control has been widely investigated, the possible effects of brushing on sealant retention and surface integrity are still not well characterized. This *in vitro* study evaluated whether manual, electric, and sonic toothbrushing influence the shear bond strength (SBS) and surface roughness of resin-based sealants.

Methods: sixty flat enamel samples were prepared from bovine teeth and allocated to three groups (n = 20) according to brushing mode. Each specimen underwent a standardized, 30-minute simulated brushing protocol under a constant applied force. SBS was measured with a universal testing machine, roughness was quantified using profilometry, and scanning electron microscopy (SEM) was used to examine surface alterations.

Results: SBS did not differ significantly among the three brushing modalities ($p = 0.287$). In contrast, surface roughness varied significantly across groups ($p < 0.001$), with sonic brushing producing the greatest roughness and showing more evident surface deterioration on SEM images.

Conclusions: under controlled experimental conditions, toothbrush type did not affect sealant adhesion; however, sonic brushing increased surface wear. Clinically, these data suggest that sealants in pediatric patients using high-frequency toothbrushes may benefit from closer follow-up.

ION RELEASE AND CHANGES IN MORPHOLOGICAL AND MICROMECHANICAL PROPERTIES OF TWO BIOACTIVE RESTORATIVE MATERIALS: AN *IN VITRO* STUDY

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Aim: oral environment-induced changes of the properties of recently developed bioactive restorative materials used in pediatric dentistry remain poorly investigated. The aim of this study was to evaluate *in vitro* ion exchange as an indicator of bioactivity, along with changes in mechanical and morphological properties of two bioactive materials under different conditions (neutral and acidic).

Methods: a total of 140 standardized disc-shaped samples (70 ACTIVA™ BioACTIVE Restorative™ and 70 GC Fuji II LC) were prepared and immersed in solutions at pH 6.3 or pH 2.2. Analyses included SEM-EDX to assess morphology and ion release, 3D optical profilometry for surface roughness, mechanical wear testing, and pH monitoring at 0, 7, 14, and 21 days.

Results: ACTIVA showed greater mechanical and microstructural resistance, with significant calcium release, particularly in acidic conditions, while maintaining a stable and regular surface morphology. Fuji II LC exhibited higher fluoride release and strong buffering capacity in acidic environments but lower mechanical resistance and increased microfracture formation. Both materials maintained stable surface roughness over time in all conditions.

Conclusions: although limited to *in vitro* conditions, these findings suggest that ACTIVA may be more suitable for restorations under high mechanical stress, whereas Fuji II LC may be preferable for patients at high caries risk due to its enhanced fluoride release. Further *in vivo* studies are needed to confirm the clinical relevance of these findings.

EFFECT OF MANUAL, ELECTRIC, AND SONIC TOOTHBRUSHING ON SURFACE PROPERTIES AND RETENTION OF COMPOSITE RESTORATIONS IN PRIMARY TEETH: AN *IN VITRO* STUDY

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Aim: to evaluate the effect of manual, electric, and sonic toothbrushing on the surface hardness, surface roughness, and retention of composite restorations in primary teeth.

Methods: thirty extracted non-carious primary teeth were restored with a resin-based composite following a standardized total-etch adhesive protocol. Specimens were randomly divided into three groups (n = 10) according to the toothbrush type used for brushing simulation: manual, electric and sonic toothbrush.
After a 2-minute brushing procedure, restorations were evaluated for surface microhardness using a Vickers microhardness tester, surface roughness (Ra) using contact profilometry, and restoration retention under shear load using a universal testing machine.
Statistical analysis was performed using one-way ANOVA followed by Tukey HSD post hoc test ($\alpha = 0.05$).

Results: no significant differences were observed among the groups for surface microhardness (Manual: 80.36 ± 2.93 HV; Electric: 80.45 ± 3.79 HV; Sonic: 81.86 ± 4.34 HV; $p = 0.606$) or restoration retention under shear load (Manual: 154.58 ± 20.56 N; Electric: 159.54 ± 25.35 N; Sonic: 153.88 ± 15.94 N; $p = 0.806$). In contrast, surface roughness values differed significantly among groups ($p < 0.001$), with the highest roughness observed after sonic toothbrushing.

Conclusions: within the limitations of this *in vitro* study, sonic toothbrushing produced significantly higher surface roughness on composite restorations compared with manual and electric brushing, while no significant effects were observed on surface hardness or restoration retention.

HIDDEN VULNERABILITY: PERIODONTAL SUSCEPTIBILITY AND CARIES PREVALENCE IN PAEDIATRIC PATIENTS WITH DOWN SYNDROME

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Aim: this study aimed to evaluate the association between Down syndrome (DS) and periodontal disease or dental caries in a paediatric population, assessing oral hygiene effectiveness and the impact of anatomical and behavioural factors on oral health outcomes in patients with special needs.

Methods: a cross-sectional single-centre study was conducted on 80 children (40 DS, 40 healthy controls), aged 3-18 years, attending the Paediatric Dentistry Unit of the Dental School. The following indices were recorded: Plaque Control Record (PCR), Gingival Bleeding Index (GBI), Gingival Index (GI), and DMFT/dmft indices. Statistical comparisons were performed using the Mann-Whitney U test.

Results: GBI and GI were significantly higher in DS patients ($p < 0.001$ for both), confirming greater susceptibility to gingival inflammation. No significant difference was found for PCR ($p = 0.094$), suggesting comparable plaque levels despite differing inflammatory responses. DMFT showed no significant difference ($p = 0.568$). Conversely, dmft was significantly lower in DS patients ($p < 0.001$), with a mean of 0.275 *vs* 2.90 in controls.

Conclusions: DS patients show increased periodontal susceptibility independent of plaque levels, driven by immune dysfunction, altered subgingival microbiota and anatomical factors. Lower dmft values may reflect protective features such as diastemas, microdontia and delayed eruption, alongside consistent early preventive care. These findings highlight the need for tailored periodontal follow-up, oral hygiene instruction, fluoride prophylaxis and personalised preventive protocols for DS patients.

CERVICAL VERTEBRA C4 (CAMERIERE METHOD): A RELIABLE INDICATOR FOR ORTHODONTIC TREATMENT TIMING: SARDINIAN SAMPLE

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Determining skeletal maturity is crucial in orthodontic planning, as the success of functional and orthopaedic treatments depends on the patient's growth spurt.

Traditional methods, such as qualitative assessment of cervical vertebrae or hand-wrist radiography, have limitations in terms of subjectivity and increased radiographic exposure. The method of Cameriere *et al.* (2023) proposes a quantitative approach based on the ratio between the anterior and posterior height of the C4 vertebral body (Vba), which is useful for accurately identifying the beginning and end of the pubertal growth peak.

Assess skeletal maturity in a group of paediatric orthodontic patients by means of the Vba ratio (C4) and compare the results with the reference values of Cameriere *et al.* in order to identify the growth phase useful for therapeutic planning.

Twenty-eight subjects (age 6-11 years) undergoing latero-lateral teleradiography were analysed. The anterior (A) and posterior (B) height of the C4 vertebral body were measured on each image and the ratio Vba = A/B was calculated. The drawing of the lines, the analysis of the X-rays and the related calculations were done using the Agestimation project application, which allows us to load the X-rays, draw the lines of our interest and immediately get the result based on the study conducted by Professor Cameriere on the cervical vertebrae. The values were compared with reference intervals: $Vba_1 \approx 0.67$ $Vba_2 \approx 0.97\text{-}1.07$.

It is therefore believed that vertebral analysis according to the Cameriere method can be considered a valid alternative to wrist radiography for assessing growth peaks and is considered an advantage for adolescent patients as they are not exposed to high levels of radiation, since teleradiography is always prescribed by orthodontic specialists for diagnosis and treatment planning.

VALIDATION OF AI CEPH 2D MODULE FOR AUTOMATIC LANDMARK DETECTION AND CEPHALOMETRIC MEASUREMENT ANALYSIS: COMPARATIVE ANALYSIS WITH MANUAL ANNOTATIONS

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Aim: this study aimed to validate the accuracy of AI-based automated cephalometric analysis software (AI CEPH 2D) by comparing its landmark positioning accuracy and cephalometric measurements against manual annotations performed by an expert clinician.

Methods: thirty lateral cephalometric radiographs (M:F=18:12; mean age 12 ± 2.5 years) were acquired using Ceph Extraoral Hyperion X9 and exported in DICOM format. Anatomical landmarks were annotated manually by an expert operator using CVAT software, generating the gold standard dataset. AI CEPH 2D system performed fully automated analyses without operator intervention. The accuracy of landmark detection was assessed by comparing the spatial coordinates (x, y) between manual and AI annotations. Orthodontic measurements were evaluated through descriptive and inferential statistical analyses.

Results: of the 69 assessed landmarks, 13 (18.8%) exhibited statistically significant differences ($p < 0.05$) between manual and AI-generated coordinates. For orthodontic measurements, significant differences were observed for ANB (mean difference: 1.92°, $p = 0.005$), SNA (mean difference: 4.03°, $p = 0.001$), SNB (mean difference: 2.11°, $p = 0.038$). The remaining orthodontic parameters did not demonstrate statistically significant differences.

Conclusions: AI CEPH 2D provided high concordance (81,2%) with manual annotations for the majority of the anatomical landmarks analyzed. Similarly, 7 out 10 orthodontic parameters demonstrated no significant difference, supporting the reliability of the AI system for routine clinical use.

WEARABLE-BASED ASSESSMENT OF PEDIATRIC DENTAL STRESS: EFFECTS OF PROCEDURE TYPE, TREATMENT STAGE AND AGE

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Aim: to quantify physiological stress in children during common dental procedures using a wearable, noninvasive measure (heart rate variability-derived stress score) and to determine whether stress differs by procedure type, treatment phase, and age.

Methods: eighty children aged 5-10 years were randomized into four groups: dental hygiene, restorations with local anesthesia, restorations without anesthesia, and sealant placement. Stress was monitored with Garmin smart watches, which convert HRV into a 0-100 stress score. Measurements were taken at three procedure phases (start, during, end), yielding nine recordings per participant. Effects of procedure type and phase were tested with two-way repeated-measures ANOVA with post hoc comparisons.

Results: procedure type alone was not a significant predictor of stress, but stress changed across treatment phases ($p = 0.0249$), and there was a significant procedure-by-phase interaction ($p = 0.0004$). Post hoc analyses showed a progressive decrease in stress during dental hygiene ($p < 0.05$), whereas restorations with anesthesia produced a significant rise in stress during the procedure ($p = 0.0011$). No meaningful phase-related changes were detected for restorations without anesthesia or for sealant application. Age was negatively associated with stress.

Conclusions: pediatric dental stress varies mainly with the treatment phase and, for some procedures, shows distinct phase-specific patterns. Wearable devices offer a feasible way to track stress in real time in the dental setting.

CLINICAL OUTCOME OF DECIDUOUS TEETH TREATED WITH CONSERVATIVE AND ENDODONTIC THERAPY: A TEN-YEAR RETROSPECTIVE STUDY ON 2000 TEETH

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Aim: preserving primary teeth until physiological exfoliation represents a key goal of pediatric dentistry.
The present study aimed to retrospectively assess the 10-year clinical outcome of deciduous teeth restored with conservative fillings, pulpotomy, pulpectomy by a single operator, evaluating the proportion of teeth that exfoliated physiologically, required premature extraction, or showed delayed exfoliation.
Materials and methods: this retrospective study analysed dental records collected over a 10-year period at a paediatric dental practice.
The initial sample consisted of 2000 primary teeth managed with three different therapeutic approaches: conservative restoration, pulpotomy, pulpectomy. The investigation recorded the initial treatment modality, any subsequent modifications, early extractions, and the pattern of exfoliation.
The chi-square test was used to compare outcomes among the three treatment groups.
Results: after exclusion of cases with incomplete follow-up, 1680 teeth were included in the final analysis. Conservative restorations achieved the highest success rate (84%), followed by pulpotomy (70%) and pulpectomy (50%).
Delayed exfoliation occurred in 2% of cases and may have been associated with ankylosis or delayed eruption of the permanent successor.
Conclusions: the findings suggest that both conservative and endodontic procedures in primary teeth can successfully maintain the dentition until physiological exfoliation.
Further prospective studies are warranted to better identify the prognostic factors influencing the long-term survival of treated deciduous teeth.

ERUPTION ANOMALIES OF MAXILLARY LATERAL INCISOR AND CANINE IN PATIENTS WITH CLEFT LIP AND PALATE: A RETROSPECTIVE STUDY OF 56 CASES

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Aim: to evaluate the frequency of eruption anomalies of the maxillary lateral incisor and canine in patients with cleft lip and palate and to analyze their association with cleft type, lateral incisor agenesis, orthodontic treatment and/or alveolar bone grafting, and other dental anomalies.
Methods: a retrospective observational study was conducted on 56 patients (28 males, 28 females; mean age 11 ± 1.41 years) treated between April 2024 and October 2025. Clinical and radiographic data were collected, including cleft type and side, presence of lateral incisor, orthodontic treatment and/or bone grafting, delayed eruption, and other dental anomalies. Data were analyzed descriptively using frequencies and percentages.
Results: unilateral cleft lip and palate (39.3%) was the most frequent cleft type. Orthodontic treatment and/or bone grafting were performed in 64.3% of patients. Delayed eruption was observed in 14.3% of lateral incisors and 28.6% of canines. Lateral incisor agenesis was present in 44.6% of cases. Delayed eruption of the lateral incisor was mainly associated with unilateral and bilateral clefts, while delayed canine eruption was more frequent in patients with lateral incisor agenesis. Patients without canine eruption delay more frequently underwent orthodontic and/or surgical treatment.
Conclusions: the maxillary canine emerges as the tooth most prone to eruption disturbances in patients with cleft lip and palate, particularly in association with lateral incisor agenesis. These findings highlight the critical role of the lateral incisor as an eruptive guide and underscore the importance of early radiographic assessment. A timely, coordinated multidisciplinary orthodontic-surgical approach is essential to optimize eruption pathways, improve treatment outcomes, and minimize the risk of canine impaction.

THE ASSOCIATION BETWEEN MOLAR INCISOR HYPOMINERALIZATION (MIH) AND DISPLACED MAXILLARY CANINES: A CROSS-SECTIONAL STUDY ON GROWING SUBJECTS

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Aim: to assess the prevalence of Molar Incisor Hypomineralization (MIH) in a sample of growing subjects and to evaluate its possible association with displaced maxillary canines.

Methods: this retrospective study included 1,513 patients (aged 8-10 years) in mixed dentition selected from two clinical centers. Subjects were divided into two groups: Group 1 (patients with displaced maxillary canines and high risk of impaction) and Group 2 (patients with normally positioned canines). Canine position was assessed using clinical examination and panoramic radiographs. MIH was diagnosed based on the European Academy of Paediatric Dentistry (EAPD) criteria. The prevalence of MIH and displaced canines was calculated, and their association was analyzed using the chi-square test. Odds ratios (OR) with 95% confidence intervals (CI) were computed. Statistical significance was set at $p < 0.05$.

Results: the overall prevalence of MIH was 33.1%, while displaced maxillary canines were observed in 5.2% of the sample. Among patients with displaced canines, 56% were affected by MIH. The prevalence of displaced canines was significantly higher in the MIH group (8.8%) compared to the non-MIH group (3.4%) ($p < 0.001$). Patients with MIH showed a significantly increased likelihood of presenting displaced maxillary canines (OR = 2.78; 95% CI: 1.73-4.46).

Conclusions: a significant association was found between MIH and displaced maxillary canines in growing patients. These findings suggest that MIH may be part of a broader pattern of dental developmental disturbances. Early orthodontic evaluation of patients affected by MIH may be recommended to facilitate timely detection and management of eruption anomalies.

ASSOCIATION BETWEEN CLEFT LIP AND PALATE AND CLASS III MALOCCLUSION: A RETROSPECTIVE STUDY

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Aim: Cleft lip and palate (CLP) is a common congenital craniofacial malformation. Severe phenotypes cause functional impairments in respiration, phonation, and mastication. While primary surgical treatment is essential, scar formation often restricts maxillary growth, leading to maxillary hypoplasia and skeletal Class III malocclusion. This study aims to evaluate the prevalence and severity of skeletal Class III malocclusion in patients with unilateral and bilateral CLP.

Materials and methods: this retrospective study, which has been conducted with Bambino Gesù Pediatric Hospital's multidisciplinary CLP service, includes a sample of approximately 100 patients. The research analyzes medical records, orthopantomographs, and lateral cephalometric radiographs. To quantify the degree of maxillomandibular discrepancy, the cephalometric analysis evaluates sagittal skeletal parameters, specifically the SNA, SNB, and ANB angles, alongside the Wits appraisal.

Results: preliminary data from this ongoing project indicate an increased prevalence of skeletal Class III malocclusion in CLP patients. This supports literature's findings demonstrating that surgical scarring negatively impacts and alters maxillary growth in these individuals.

Conclusions: the study highlights the pivotal need for early diagnosis and tailored therapeutic planning in CLP patients. Correcting transverse and sagittal discrepancies and restoring proper morpho-functional relationships within the craniofacial complex frequently requires a combined orthodontic-surgical approach.

IMPACT OF COVID-19 PANDEMIC ON DENTAL CARIES PREVALENCE IN PEDIATRIC PATIENTS: A RETROSPECTIVE STUDY

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Aim: to evaluate the impact of the COVID-19 pandemic on dental caries prevalence in pediatric patients attending a university hospital pediatric dentistry unit.

Methods: a retrospective observational study was conducted analyzing clinical records of patients aged 2-14 years who attended the Pediatric Dentistry Unit of A.O.U. Federico II from 2018 to 2024. Caries presence was assessed through clinical and radiographic examination. Patients were classified according to dentition type (primary and permanent), age, and sex. Caries prevalence was calculated and compared across pre-pandemic, pandemic, and post-pandemic periods.

Results: a total of 7468 patients were included. In primary dentition, mean caries prevalence remained stable overall (45.49%) but showed a significant increase during the pandemic, peaking in 2021 (55.56%), especially in younger children (2-5 years). In permanent dentition, overall prevalence decreased slightly from 45.41% (2018) to 40.10% (2024), although higher rates were observed in older age groups (12-14 years). Despite a reduction in the number of visits during the pandemic, caries prevalence increased across most subgroups.

Conclusions: the COVID-19 pandemic negatively impacted pediatric oral health, particularly in primary dentition, likely due to reduced access to dental care and worsening lifestyle habits. Preventive strategies should be reinforced to mitigate long-term consequences.

AMCOP® ELASTODONTIC APPLIANCES FOR INTERCEPTIVE CLASS III TREATMENT IN CHILDREN: A RETROSPECTIVE STUDY

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Aim: to evaluate the therapeutic efficacy of the AMCOP® TC bioactivator in growing patients with Class III dentoskeletal malocclusion and to report representative clinical cases.

Materials and methods: this retrospective case series included 11 pediatric patients (5 males, 6 females; 6-12 years) treated with the AMCOP® TC elastodontic appliance. The protocol involved 2 hours of daytime use and overnight wear for 6-8 months, followed by nocturnal use only. Lateral cephalograms were acquired at baseline (T0) and at the end of treatment (T1). Cephalometric analysis was performed using DeltaDent® software.

Results: cephalometric evaluation showed an improvement in sagittal skeletal relationships, with an increase in the ANB angle from T0 to T1. Clinical findings demonstrated correction of Class III dentoskeletal discrepancies. A favorable effect on cervical posture, particularly at the upper cervical level, was also observed.

Conclusions: AMCOP® TC elastodontic therapy appears to be an effective, minimally invasive option for early treatment of Class III dentoskeletal malocclusion in growing patients, with high compliance. However, further controlled studies with larger samples are required to confirm these findings.

RAPID MAXILLARY EXPANSION AND OLFACTORY FUNCTION IN GROWING PATIENTS: CLINICAL AND INTERDISCIPLINARY IMPLICATIONS

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Aim: to assess changes in olfactory function in growing patients undergoing rapid maxillary expansion (RME) and explore its potential clinical implications beyond dento-skeletal correction, particularly regarding nasal airflow and sensory performance.

Materials and methods: the study sample consisted of 20 patients (12M and 8F>; mean age 8.57 ± 1.09 years) recruited from the Department of Paediatric Dentistry (0-14 years old) at the Policlinico of Rome Tor Vergata, according to the following inclusion criteria: transverse maxillary posterior transverse interarch discrepancy ≥ 4 mm), mixed dentition, and prepubertal skeletal maturation stage (CS1-2). All subjects were treated with a Hyrax-type rapid maxillary expander. Dental and ENT evaluations were performed pre- and post-treatment. Olfactory function was assessed using the Sniffin' Sticks® battery (threshold, discrimination, identification), alongside structured questionnaires on subjective perception.

Results: olfactory function improved after RME, with a statistically significant increase in odor discrimination ($p < 0.001$). Odor identification showed a non-significant positive trend. Subjective reports aligned with objective findings: 60% of patients noted improved olfactory perception and discrimination, with no reported worsening.

Conclusions: RME may enhance olfactory function in growing patients, particularly odor discrimination, likely due to increased nasal cavity dimensions and improved airflow facilitating odorant delivery. Although preliminary, these findings suggest additional functional benefits of RME and support a multidisciplinary orthodontic-ENT approach. Larger, long-term studies are needed to confirm clinical relevance.

QUANTITATIVE AND QUALITATIVE ANALYSIS OF MIH LESIONS USING OPTICAL COHERENCE TOMOGRAPHY (OCT)

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Aim: to evaluate enamel structural alterations in children with molar incisor hypomineralization (MIH) using optical coherence tomography (OCT) through qualitative and quantitative analyses.

Methods: twenty MIH-affected teeth were included and classified as mild (n = 14), moderate (n = 4), and severe (n = 2). A control group of 10 patients with sound enamel was enrolled. OCT provided high-resolution cross-sectional imaging based on light backscattering, allowing visualization of enamel microstructure. Quantitative analysis was conducted using image-processing software (ImageJ).

Results: qualitative OCT analysis showed that MIH-affected enamel consistently exhibited altered reflectivity patterns, increased backscattering, and subsurface signal heterogeneity, features absent in sound enamel, which showed a uniform optical structure. OCT findings were consistent with a pre-eruptive origin of MIH lesions, in agreement with the literature. Quantitative analysis demonstrated significantly higher optical signal intensity and greater lesion depth in MIH teeth compared to controls ($p < 0.05$). Lesion depth and signal characteristics varied according to severity; however, some heterogeneity was observed across samples.

Conclusions: OCT enables reliable qualitative and quantitative characterization of MIH lesions, revealing structural heterogeneity not always predictable from clinical appearance. This non-invasive technique represents a useful tool for the diagnosis and assessment of MIH in children.

Funded by PRR M4C2 PRIN M.E.T.A.D.EN.T., EU Next Generation (MUR 20222YTC5A; CUP D53D23007740006)

PREDICTORS OF GINGIVAL INFLAMMATION IN CHILDREN WITH DOWN SYNDROME: A COMPARISON BETWEEN CLINICAL ANALYSIS AND MACHINE LEARNING

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Aim: can machine learning predict gingival inflammation in children with Down syndrome? This study aimed to compare traditional clinical analysis with machine learning models in identifying predictors of gingival inflammation in children with Down syndrome.

Methods: a cross-sectional observational study was conducted on 100 children with Down syndrome. Among them, 70 cooperative patients were included in the final analysis. Clinical variables and risk factors associated with gingival bleeding were recorded. The dataset was subsequently analyzed using machine learning algorithms to identify the most relevant predictors of gingival inflammation and to evaluate their predictive performance.

Results: machine learning models demonstrated good performance in predicting gingival inflammation risk. The Random Forest model showed the best classification performance, correctly identifying patients with high gingival inflammation in 96.8% of cases and low inflammation in 94.9% of cases. Feature ranking analysis identified toothbrushing frequency and plaque index as the most relevant predictors. Machine learning findings were consistent with traditional clinical analysis. Misclassifications were mainly observed in borderline cases.

Conclusions: machine learning confirmed and complemented traditional clinical findings. Both oral hygiene behavior and plaque accumulation play a central role in gingival inflammation. These findings suggest that artificial intelligence may represent a useful tool to support clinical decision-making, although results should be considered preliminary.

ORAL HEALTH-RELATED QUALITY OF LIFE IN CHILDREN WITH MOWAT-WILSON SYNDROME COMPARED WITH AUTISM SPECTRUM DISORDERS AND HEALTHY PEERS

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Background: Mowat-Wilson Syndrome (MWS) is a rare genetic disorder characterized by intellectual disability and multiple systemic comorbidities that may negatively affect oral health. However, its impact on oral health-related quality of life (OHRQoL) in affected children and families remains poorly understood.

Methods: a cross-sectional observational study was conducted on pediatric subjects with MWS. Caregivers completed structured questionnaires, including the Parental-Caregiver Perceptions Questionnaire (P-CPQ) and the Family Impact Scale (FIS). Outcomes were compared with age- and parental education-matched groups of children with autism spectrum disorders (ASDs) and healthy controls.

Results: a total of 76 subjects were included (19 MWS; 19 ASDs; 38 controls). In P-CPQ, the "oral symptoms" and "functional limitations" domains showed significant differences ($p < 0.01$), with higher scores observed in the MWS group, followed by ASDs and healthy controls. This pattern was confirmed in the overall analysis. Differences in the "emotional" and "social well-being" were less pronounced and reached significance only between ASDs and healthy controls ($p < 0.05$). Total P-CPQ scores were significantly higher in both MWS and ASDs groups compared to healthy controls ($p < 0.001$), with no significant difference between the two groups.

For the FIS, mean scores were higher in the ASD group, although differences were not consistently significant. However, specific domains, including "activity" and "family conflict," were significantly more affected in ASDs ($p < 0.001$).

Conclusions: MWS is associated with a greater impact on OHRQoL, particularly in terms of oral symptoms and functional limitations, whereas ASDs appear to exert a stronger impact on daily activities and family functioning.

MONITORING COMPLIANCE IN DEVELOPMENTAL-AGE PATIENTS TREATED WITH ALIGNERS: THE ROLE OF ARTIFICIAL INTELLIGENCE THROUGH THE VIRTUAL CARE SYSTEM

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Aim: to evaluate the effectiveness of the AI-based Invisalign® Virtual Care system in monitoring compliance and optimizing clinical management of paediatric patients treated with clear aligners.

Methods: twenty paediatric patients undergoing aligner therapy were remotely monitored using Virtual Care. Using a smartphone-connected device, patients independently acquired frontal, lateral, and occlusal intraoral images, automatically analysed by the system. The software assessed aligner fit, treatment progression, clinical issues such as attachment loss or aligner fracture, and oral hygiene. The platform also enabled secure clinician-patient communication.

Results: virtual Care proved effective in monitoring compliance. Patients performing regular home acquisitions demonstrated improved oral hygiene, greater treatment awareness, and higher cooperation. Clinically, the system allowed early detection of aligner misfit by highlighting critical areas, enabling timely interventions such as adjustment of aligner change intervals, anticipation of follow-up visits, and early requests for refinements. These measures enhanced treatment efficiency and reduced overall treatment time in more compliant patients. Additionally, the system increased patient engagement through perceived continuous monitoring.

Conclusions: AI-assisted remote monitoring using Virtual Care represents a valuable adjunct in managing growing patients treated with aligners. While not a substitute for in-office evaluation, it enables earlier, more frequent, and proactive monitoring between visits, improving detection of clinical and behavioural issues. Its integration into routine orthodontic practice may enhance treatment predictability, efficiency, and patient engagement.

WHITE SPOT LESIONS IN ITALIAN CHILDREN AND ADOLESCENTS: A MULTICENTER CROSS-SECTIONAL STUDY

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Aim: an increase in the prevalence of white spot lesions (WSLs) has been observed in pediatric populations, emphasizing the importance of preventive strategies. Therefore, the aim of the present multicenter cross-sectional study was to evaluate the prevalence of WSLs among children and adolescents in northern (Trieste), central (Rome), and Italy (Palermo).

Methods: healthy participants (<18 years of age) were assessed during their first visit at 3 different university departments. Parents or caregivers completed a questionnaire on demographic and family background, oral hygiene habits, orthodontic treatment, dietary habits and frequency of dental visits. Moreover, clinically WSLs were recorded as ICDAS-II codes 1-2, while more advanced carious lesions as ICDAS-II codes 3-6.

Results: a statistically significant difference in WSL prevalence was observed among the three centers ($p < 0.001$), with higher rates reported in Palermo (66.6%) and Rome (63.1%) compared with Trieste (45.9%). Parental employment status and education level were associated with lesion prevalence. An increased risk was also linked to frequent use of sweetened pacifiers, orthodontic appliance therapy and a higher frequency of dental visits. Conversely, a lower prevalence of WSLs was observed in subjects with frequent snack consumption or with a higher number of carious lesions.

Conclusions: the high WSLs prevalence among Italy highlights the widespread nature of this condition and underscores the importance of early diagnosis, to further enhance quality of life and reduce healthcare-related costs.

PERIODONTAL PHENOTYPE AND DENTAL CROWDING IN PEDIATRIC PATIENTS

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Aim: the gingival phenotype (GP) is a key biological factor influencing periodontal response to orthodontic treatment. Early identification of a thin GP in children may help anticipate mucogingival vulnerability and guide interceptive strategies. This study aimed to assess GP distribution across dentition phases and explore its association with anterior tooth size discrepancy.

Methods: a cross-sectional study included 146 pediatric patients at different dentition stages (deciduous, early and late mixed, and full permanent). GP was measured using a color-coded periodontal probe (ColorvueBiotype Probe) and classified into four categories, then dichotomized as thin *vs* non-thin. The anterior Bolton index (%) assessed tooth size discrepancy. Multivariate logistic regression identified factors associated with thin GP, expressed as odds ratio (OR) with 95% confidence intervals (CI). Model performance was evaluated using AUC-ROC and Hosmer-Lemeshow test.

Results: mean age was 128.5 ± 47.2 months; 52% were males. A thin GP was found in 37.7% of subjects. The anterior Bolton index averaged 78.3 ± 8.0%. After adjustment for age, sex, and dentition, a lower Bolton index was significantly associated with thin GP (OR = 0.93; 95% CI 0.88-0.99; p = 0.032). Each 1% increase in the index reduced the likelihood of a thin GP by 7%. Model discrimination was moderate (AUC = 0.68) with good calibration (p = 0.52).

Conclusions: a reduced anterior Bolton index correlates with a thin gingival phenotype, suggesting increased mucogingival susceptibility. Dental and demographic predictors showed fair accuracy, supporting their use as early screening tools. Longitudinal studies are needed to confirm these associations.

ENVIRONMENTAL IMPACT AND DISPOSAL STRATEGIES OF CLEAR ALIGNERS

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Aim: to evaluate the environmental impact of clear aligners, with focus on plastic waste, micro- and nanoplastic (MNP) release, and current disposal and recycling strategies.

Methods: a narrative review of studies on clear aligners was conducted, including investigations on chemical recycling via alkaline hydrolysis, *in vitro* simulations of mechanical wear to assess MNP release and analyses of production processes and environmental footprint. Data on emerging materials and microbial biodegradation of aligner-related polymers were also considered.

Results: clear aligners contribute significantly to plastic pollution due to widespread use, energy-intensive production, and limited recyclability compared with traditional orthodontic appliances. Mechanical stress during use leads to MNP release, with directly 3D-printed aligners generating larger and more abundant particles than thermoformed aligners. Chemical recycling via alkaline hydrolysis allows recovery of degradation products under controlled conditions, although its application remains limited. Microbial PET biodegradation is promising but constrained by slow kinetics and limited scalability. Clinical management, including frequent aligner replacement, further increases waste generation.

Conclusions: despite advantages such as improved hygiene, reduced invasiveness, greater comfort and accessibility, especially in mixed dentition, clear aligners pose a growing environmental concern. Development of sustainable materials, effective recycling strategies and optimized clinical protocols is therefore needed.

DELAYED TOOTH ERUPTION IN SYNDROMIC CHILDREN: A SYSTEMATIC REVIEW

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Aim: delayed tooth eruption is a common condition in pediatric patients and is frequently associated with genetic disorders and syndromes, with implications for their clinical management. This systematic review aimed to identify the syndromes most strongly associated with delayed tooth eruption.

Methods: the review was conducted in accordance with PRISMA guidelines. Observational studies were included and identified through a systematic search of PubMed and Scopus. The research question was defined using the PICO framework.

Results: sixteen studies were included. All selected studies provided data on the prevalence of delayed tooth eruption in syndromic patients and reported a statistically significant association between syndromic conditions and eruption delay. Down syndrome was the condition most frequently associated with delayed eruption in both primary and permanent dentitions. Most studies involved children aged 0-16 years and evaluated both dentitions. In some studies, delayed eruption was specified for individual teeth, whereas in others it was described at a generalized level.

Conclusions: delayed tooth eruption is a frequent finding in syndromic patients, particularly in those with Down syndrome, and may have relevant clinical implications. A systematic understanding of the syndromes associated with eruption delay is essential to improve diagnosis, clinical management and treatment planning in this patient population.

TEMPOROMANDIBULAR DISORDERS IN YOUTH: PREVALENCE AND EPIDEMIOLOGICAL INSIGHTS

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Aim: Temporomandibular disorders (TMDs) are increasingly recognized in children and adolescents, but their epidemiology remains unclear and diagnostic criteria are largely derived from adults. This study aimed to provide an updated overview of TMD prevalence in young populations, focusing on sex differences.

Methods: a literature search of PubMed, Web of Science, and LILACS was performed for studies published up to January 31, 2026, reporting TMD prevalence in pediatric and adolescent populations. Eligible studies were selected according to predefined criteria and included in qualitative synthesis.

Results: of 40 identified records, 4 studies met the inclusion criteria, including 1,914 participants (1,093 females, 821 males). Overall, 38.4% of subjects (n = 736) had TMD. Prevalence was higher in females (44.7%) than in males (30%). Across studies, prevalence ranged from 20% to 60%. Females also showed a greater frequency of symptoms and overall burden.

Conclusions: TMDs appear relatively common in children and adolescents, with higher prevalence in females. However, the suitability of current diagnostic criteria for younger patients remains uncertain. Further studies are needed to improve diagnostic validity and clinical applicability in this age group.

ARTIFICIAL INTELLIGENCE APPLICATIONS IN PEDIATRIC DENTISTRY: AN EVIDENCE-BASED SCOPING REVIEW

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Aim: this systematic review aims to identify, categorize, and critically evaluate the current applications of Artificial Intelligence (AI) in pediatric dentistry, as it's now emerging as an innovative technology in many fields.

Methods: a comprehensive literature search was conducted across the Embase, Scopus, PubMed, and Web of Science databases, including studies published up to December 2023. Eligible studies investigated the implementation of AI technologies in pediatric dental practice.

Results: a total of 1,301 records were retrieved, and 64 studies met the predefined inclusion criteria and were included in the final analysis. The findings indicate that AI algorithms and machine learning approaches are increasingly applied in pediatric dentistry, particularly for the early detection and diagnosis of dental pathologies, automated cephalometric analysis, prediction of craniofacial growth, and the development of digital tools to support behavioral guidance and oral hygiene education in children.

Conclusions: AI-based systems demonstrate significant potential to enhance diagnostic accuracy, optimize clinical workflows, and improve patient outcomes in pediatric dentistry. Future perspectives include the implementation of cloud-based infrastructures for large-scale data integration, which may further refine predictive performance and expand the clinical applicability of AI technologies in this field.

BILATERAL HYPERPLASIA OF THE CORONOID PROCESS IN PEDIATRIC PATIENTS: WHAT IS THE GOLD STANDARD FOR TREATMENT? A SYSTEMATIC REVIEW OF THE LITERATURE

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Aim: this study describes therapeutic options for bilateral coronoid process hyperplasia in pediatric patients, analyzing etiological and diagnostic correlations and long-term outcomes, aiming to identify the gold standard treatment.

Methods: a systematic review was conducted following PRISMA guidelines using MEDLINE, PubMed, Embase, and Cochrane Library up to December 5, 2017. Clinical studies, case reports, and reviews involving pediatric patients were included. After duplicates and criteria application, 38 articles were selected. Extracted data included demographics, treatment type (intraoral/extraoral coronoidectomy, coronoidotomy, physiotherapy), pre- and postoperative mouth opening, and follow-up duration.

Results: bilateral coronoid hyperplasia causes progressive limitation of mouth opening (<20 mm), affecting craniofacial growth and function. Surgical treatment increased mouth opening by 5-25 mm, with better outcomes for intraoral coronoidectomy combined with early intensive rehabilitation. Only some patients achieved physiological opening (>30 mm), especially without adequate physiotherapy or during growth.

Conclusions: early diagnosis is essential; CBCT is the gold standard. The preferred treatment is intraoral coronoidectomy combined with rehabilitation. Literature limitations include few longitudinal studies assessing long-term treatment stability.

ORAL MANIFESTATIONS OF SYSTEMIC AUTOIMMUNE DISEASES IN PEDIATRIC PATIENTS

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Aim: systemic autoimmune diseases in pediatric age represent a heterogeneous group of disorders characterized by multisystem involvement and often insidious onset. In many cases, the oral cavity represents a site of early or concomitant manifestations, which may precede the appearance of more evident systemic signs and contribute to diagnostic suspicion. The aim of this study is to analyze the main oral manifestations associated with systemic autoimmune diseases in pediatric patients, highlighting their clinical variability, degree of specificity, and potential role in early diagnosis. A further objective is to provide a practical synthesis tool useful for the clinical practice of the pediatric dentist.

Methods: a narrative review of scientific literature regarding oral manifestations of the main pediatric autoimmune diseases was conducted, including endocrinological, gastroenterological, rheumatological, dermatological, and hematological conditions. The data were analyzed and reorganized into a summary table correlating individual oral manifestations with the corresponding diseases.

Results: the review shows that oral manifestations associated with pediatric autoimmune diseases are numerous and often nonspecific.

Conclusions: oral manifestations represent a clinically relevant aspect of systemic autoimmune diseases in pediatric age and may constitute an important warning sign for early diagnosis. The role of the pediatric dentist is therefore fundamental, as is a careful evaluation of the hard and soft tissues of the oral cavity during the first visit and follow-up examinations. A multidisciplinary approach and cooperation among dentists, pediatricians, and other specialists are necessary in order to identify systemic diseases early and thus reduce their impact on patients' quality of life.

ARTIFICIAL INTELLIGENCE IN SPECIAL NEEDS PEDIATRICS PATIENTS

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Aim: the management of pediatric patients with special needs represents a daily challenge in dentistry, as this category encompasses a wide range of conditions and diverse clinical, behavioral, and communicative needs. These patients require a tailored and multidisciplinary approach. Artificial intelligence (AI) is emerging as an innovative tool capable of supporting pediatric dentists in improving diagnosis, treatment planning, and behavior management.

Methods: a review of recent literature and an analysis of clinical applications of AI in pediatric dentistry were conducted. Decision-support software, image recognition systems, and predictive tools for behavior management in special needs patients were considered.

Results: the use of AI showed improvements in diagnostic accuracy, personalization of treatment plans, and prediction of behavioral responses. AI-based tools facilitated communication with caregivers and reduced clinical time, increasing patient compliance and the effectiveness of procedures.

Conclusions: the integration of artificial intelligence in pediatric dentistry represents a valuable support in managing patients with special needs. Although further studies are needed, AI offers promising perspectives for a more personalized, efficient, and inclusive clinical approach.

A SYSTEMATIC REVIEW AND META-ANALYSIS ON POSTOPERATIVE PAIN FOLLOWING ROOT CANAL PREPARATION IN PRIMARY TEETH USING DIFFERENT INSTRUMENTATION SYSTEMS

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Aim: this systematic review and meta-analysis investigated the impact of various instrumentation techniques on postoperative pain after root canal preparation in primary teeth. The objective was to determine if mechanical rotary systems offer a significant clinical advantage over traditional manual filing in reducing patient discomfort during pediatric pulpectomy.

Methods: following PRISMA guidelines and registered on PROSPERO (CRD42020135904), we performed a comprehensive database search for clinical trials published up to November 2024. Quality assessment was performed using the Cochrane RoB 2 tool. For homogeneous studies, quantitative meta-analyses compared pain incidence and intensity between manual and mechanical groups at specific postoperative intervals.

Results: eleven studies were reviewed qualitatively, with seven contributing to the meta-analysis. Mechanical instrumentation demonstrated superior overall pain reduction compared to manual systems. Statistically significant differences were observed specifically at 6 hours ($p < 0.01$, 95% CI: 1.46) and 12 hours ($p < 0.01$, 95% CI: 2.15). No significant differences were noted at subsequent follow-up points ($p > 0.05$). The overall risk of bias across the included literature remained low.

Conclusions: rotary NiTi systems are more effective than manual methods for minimizing postoperative pain in primary teeth. These findings support the adoption of mechanical protocols to enhance both clinical efficiency and patient recovery, providing a superior alternative for the preservation of the primary dentition.

PREVALENCE OF DENTAL CARIES IN CHILDREN WITH DOWN SYNDROME: A SYSTEMATIC REVIEW

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Aim: the aim of this systematic review was to evaluate dental caries prevalence in children with Down syndrome (DS) aged ≤14 years and, when available, compare findings with non-DS controls.

Methods: this review followed PRISMA 2020. The research question was structured using the PICO framework. English-language observational studies reporting caries prevalence in children with DS were included. MEDLINE (PubMed) and Scopus were searched up to August 2025 using the terms "Down Syndrome" AND "Dental Caries". Two independent reviewers performed study selection and data extraction, including age, diagnostic criteria (WHO/ICDAS), and caries indices (dmft/DMFT).

Results: twenty studies were included. Caries prevalence in children with DS was variable and generally increased with age. Most comparative studies reported lower caries experience in DS than in controls, although some found similar or higher values when stratified by dentition stage. Prevalence ranged from 20-44% in European and American studies to 82-100% in Asian and Middle Eastern populations. Outcomes were influenced by biological, behavioural, and environmental factors, including oral hygiene, access to care, and socioeconomic status.

Conclusions: children with DS tend to show lower caries experience than controls, but findings remain inconsistent and context-dependent. Caries risk may be modulated rather than intrinsically reduced, supporting individualized prevention. Standardized criteria and longitudinal studies are needed to clarify disease patterns.

THE ROLE OF PEDIATRIC DENTISTS IN THE MANAGEMENT OF PEDIATRIC OBSTRUCTIVE SLEEP APNEA (OSA)

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Aim: pediatric obstructive sleep apnea (OSA) is a prevalent, often underdiagnosed condition linked to significant neurocognitive and systemic consequences. Given their frequent interaction with young patients, pediatric dentists and orthodontists hold a strategic role in early identification and integrated management. This narrative review synthesizes current evidence to clarify the clinical role and professional responsibilities of pediatric dentists and orthodontists within the multidisciplinary management of pediatric OSA.

Methods: a comprehensive search was performed in PubMed, Scopus, Web of Science, and EMBASE up to November 1, 2025. Review articles addressing the role of pediatric dentists and orthodontists in OSA treatment were screened. Methodological quality was assessed using the SANRA scale. Ten studies met the inclusion criteria for qualitative thematic analysis.

Results: three primary intervention areas were identified. The first area involves screening, through recognition of pathognomonic signs, validated questionnaires, and craniofacial/occlusal phenotypes; the second domain emphasize multidisciplinary pathway, emphasizing active participation in diagnosis, timely referral, and collaboration with pediatricians, otolaryngologists, and sleep specialists; the third one, Orthodontic interventions, specifically rapid maxillary expansion (RME) and mandibular advancement appliances (MAA) as adjunctive therapies for selected phenotypes, despite challenges in isolating treatment effects from somatic growth.

Conclusions: pediatric dentists and orthodontists provide a pivotal, complementary contribution to OSA management, requiring active engagement in screening protocols and shared clinical decision-making.

PEDIATRIC SLEEP BRUXISM: EXPLORING THE INTERACTION BETWEEN SLEEP DISTURBANCES, PSYCHOLOGICAL STRESS, AND ORAL HEALTH

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Aim: bruxism is characterized by repetitive, involuntary jaw muscle activity, such as grinding or clenching, often occurring during sleep without awareness. Although common in children, it is frequently underdiagnosed. This study investigated sleep bruxism in a pediatric population and its associations with sleep quality, perceived stress, and oral health conditions.

Methods: this cross-sectional study included 384 children aged 6-12 years. Ethical approval was obtained, and informed consent was signed by parents or legal guardians. Children with systemic diseases, neurodevelopmental disorders, CNS-active medications, or missing consent were excluded. Sleep bruxism was identified through parental reports according to AASM criteria. Sleep quality was assessed using sleep-related parameters, and stress was measured with the Perceived Stress Scale for Children (PSS-C). Associations were tested using the chi-square test, with $p < 0.05$ considered significant.

Results: sleep bruxism was significantly associated with several sleep quality variables, except pillow-related factors. Family characteristics, including number of siblings and maternal education, were also significantly related to bruxism. Stress levels were distributed as follows: very low 15.6%, low 34.1%, moderate 24.7%, high 24%, and very high 1.6%. Higher stress levels were significantly associated with sleep bruxism ($p = 0.001$).

Conclusions: sleep bruxism in children is associated with sleep disturbances and higher stress, supporting a multifactorial approach to pediatric assessment and management.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN PEDIATRIC DENTISTRY: OPPORTUNITIES AND CHALLENGES

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Aim: the aim of this study is to critically evaluate the current applications and emerging potential of artificial intelligence (AI) in pediatric dentistry, with particular emphasis on diagnostic accuracy, treatment planning, and patient management strategies.
Materials and methods: a narrative review of the literature was conducted through a comprehensive search of electronic databases, including PubMed, Scopus, and Web of Science. The search strategy incorporated Medical Subject Headings (MeSH) and free-text terms such as "artificial intelligence," "machine learning," "deep learning," and "pediatric dentistry."
Results: the reviewed literature demonstrates that AI-based systems, particularly those employing machine learning and deep learning algorithms, exhibit high sensitivity and specificity in the detection of dental caries, assessment of craniofacial growth patterns, and analysis of radiographic imaging in pediatric populations. Furthermore, AI applications have shown potential in predictive analytics for caries risk assessment and in supporting decision-making processes for individualized treatment planning. Emerging technologies also include AI-driven behavioral modeling tools aimed at improving patient compliance and clinical outcomes.
Conclusions: artificial intelligence represents a transformative adjunct in pediatric dentistry, with the capacity to enhance diagnostic precision, optimize clinical workflows, and facilitate personalized therapeutic approaches. However, the integration of AI into routine clinical practice necessitates further validation through large-scale, standardized studies, alongside the development of robust ethical and regulatory frameworks.

A LITERATURE OVERVIEW OF THE BIRTH DEFECTS OF CLEFT LIP AND/OR CLEFT PALATE (CL/P)

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Aim: to provide a literature overview of the birth defects of cleft lip and/or cleft palate, reporting their incidence and the multidisciplinary treatment approach at different times of life.
Methods: a systematic literature review was conducted using the PubMed database, employing the keywords "cleft lip/palate" and "orofacial clefts". Articles were selected based on their relevance to epidemiology, anatomical features, the role of genetic and environmental factors, diagnosis, and treatment, to provide a comprehensive and multidisciplinary perspective.
Results: labiomaxillary clefts result from failure of fusion between maxillary and medial nasal processes during the 36th-37th days of gestation, affecting growth and craniofacial development. The worldwide incidence is about 1/700 live births, with higher rates (1/500) in Asian and Amerindian populations. Etiology involves both genetic and environmental factors, and different phenotypes and clinical manifestations are observed.
Conclusions: diagnosis and treatment must be individualized according to the type of malformation and patient-specific response. The timing of surgical procedures is guided by functional and aesthetic needs rather than growth considerations, but successful reconstruction requires adequate maxillary development with minimal residual defects. Palatal surgery performed at 9-12 months improves speech and phonetic outcomes, coinciding with the development of plosives.

DENTAL ANXIETY IN CHILDREN: A PSYCHOLOGICAL APPROACH

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Aim: social and cultural changes have increased attention to children as individuals with distinct rights and needs. In pediatric dentistry, this requires consideration of cognitive, emotional, and relational development. Dental anxiety and fear can negatively affect clinical experience and long-term oral health.
Methods: a systematic review was conducted using MEDLINE, with keywords on dental anxiety, fear, anxious behaviors, and cognitive-behavioral therapy. Articles from 1985-2012 were selected, focusing on pediatric populations and cognitive-behavioral approaches; three non-indexed articles were also included.
Results: dental anxiety in children is multifactorial, influenced by age, gender, culture, and prior experiences. It can arise from direct experience, observation, or information from others, and is higher in childhood but may decrease with positive dental experiences. Effective management requires developmental-stage-tailored techniques, including Tell-Show-Do, positive reinforcement, distraction, voice control, and modeling. Parental involvement, quality of communication, and the clinician's empathy are crucial.
Conclusions: managing dental anxiety in pediatric patients requires a personalized, patient-centered approach based on empathy, communication, and developmental knowledge. Early positive experiences prevent phobic attitudes, and actively involving the child enhances cooperation, treatment adherence, and long-term oral health.

DIET, DAIRY PRODUCTS AND CARBOHYDRATES: IMPLICATIONS FOR ORAL HEALTH AND DISEASE PREVENTION

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Aim: to evaluate the relationship between dietary habits — particularly dairy products and carbohydrates — and oral health outcomes, including dental caries and periodontal disease.
Materials and methods: a non-systematic literature review was conducted due to the limited availability of high-quality evidence. Studies on dietary effects on oral tissues, microbiota, and inflammation were analyzed.
Results: dairy products showed protective effects on dental hard tissues through casein phosphopeptides, calcium, and phosphate, promoting remineralization and buffering oral pH. Fermented products, especially yogurt, improved the oral microbiome by reducing pathogenic species and supporting immune response. High intake of fermentable carbohydrates, particularly free sugars, was associated with increased risk of caries and inflammation. However, carbohydrate sources rich in fiber, polyphenols, and nutraceuticals exhibited protective antimicrobial and anti-inflammatory effects.
Conclusions: oral health is influenced by overall dietary patterns rather than single nutrients. A balanced diet with reduced sugar intake and regular consumption of protective foods may help prevent oral diseases. Further clinical studies are needed to support definitive recommendations.

MEDICATION-RELATED OSTEONECROSIS OF THE JAW IN THE PAEDIATRIC POPULATION: A SYSTEMATIC REVIEW

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Aim: to assess the actual incidence of MRONJ in the pediatric population receiving bone-modifying agents. Secondarily, to give dental professionals a resume of clinical features and management strategies for pediatric MRONJ.

Methods: a comprehensive literature search was completed for the relevant keywords in Scopus, Pubmed and Google Scholar. After careful selection, we considered 22 articles. Among them, 10 were case reports, 8 retrospective studies, 2 systematic reviews and 2 case series. Cases of osteonecrosis not related to BMAs (e.g., arsenic-induced or chemotherapy-induced) were also included to outline a comprehensive risk profile.

Results: large retrospective cohorts (up to 278 patients) reported no cases of MRONJ, despite hundreds of invasive dental procedures, including extractions of deciduous and permanent teeth.

Isolated cases of stage 2 MRONJ were identified in adolescents treated with high dose denosumab for Giant Cell Tumor of Bone (GCTB), often triggered by tooth extractions.

Stage 3 MRONJ was documented in young patients undergoing chemotherapy for Acute Lymphoblastic Leukemia (B-ALL) in the absence of antiresorptive agents.

Conclusions: while the risk of pediatric MRONJ appears extremely low, multidisciplinary management is essential. Invasive dental procedures should not be withheld due to pharmacological therapy, but preventive dental evaluation and constant monitoring during growth are recommended.

EFFECTIVENESS OF FUNCTIONAL APPLIANCES *VERSUS* CLEAR ALIGNERS IN THE INTERCEPTION OF CLASS II MALOCCLUSION IN GROWING PATIENTS: LITERATURE REVIEW

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Aim: to systematically review and compare the clinical effectiveness of various functional appliances and clear aligners in the treatment of Class II malocclusion in patients aged 9-11 years, specifically evaluating their impact on skeletal and dental corrections.

Materials and methods: a systematic search of electronic databases was conducted to identify studies evaluating Twin Block, Frankel functional regulators, elastodontic appliances, and clear aligners. The selection criteria focused on clinical trials and reviews involving patients in the mixed dentition phase, assessing variables such as mandibular advancement, sagittal jaw relationships, and patient compliance.

Results: traditional functional appliances, particularly the Twin Block, demonstrate superior efficacy in correcting skeletal Class II discrepancies by promoting significant mandibular advancement. The Frankel appliance was found to be most effective for influencing muscular balance and arch development, while elastodontic appliances provided a balanced approach for mild orthopedic correction. In contrast, clear aligners were most effective for dental Class II correction, offering precise control over overjet and dental alignment with significantly higher patient acceptance and comfort. Furthermore, data indicates that female patients typically exhibit an earlier orthopedic response due to accelerated skeletal maturation.

Conclusions: the choice between functional appliances and clear aligners should be individualized based on the patient's sex, skeletal age, and the specific nature of the malocclusion (dental *vs* skeletal). While functional appliances remain the gold standard for significant skeletal modification, clear aligners serve as a viable and highly accepted alternative for dental-focused corrections in growing patients.

MANAGEMENT OF PEDIATRIC PATIENTS WITH HEREDITARY ANGIOEDEMA: CASE REPORT AND LITERATURE REVIEW

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Aim: Hereditary angioedema (HAE) is a rare genetic disorder caused by C1-esterase inhibitor deficiency. It's characterized by subcutaneous or submucosal edema episodes that are potentially life-threatening, often triggered by trauma or stress, and unresponsive to conventional antihistamines. Patients fear of an HAE attack can lead to avoidance dental care, resulting in a worsening of carious lesions due to the lack of preventive measures. This study aims to outline HAE and pediatric dental management through literature review and a clinical case presentation.

Methods: review was conducted on PubMed (1997-2025), including case reports, clinical trials and narrative reviews, using keywords: "hereditary angioedema", "dental", "clinical management", "pediatric" and "anxiety." In the clinical case patient received preoperative prophylaxis with C1-inhibitor (Berinert) and sedation with midazolam, adjusted according to the level of anxiety assessed using a VAS scale.

Results: several studies highlight higher levels of anxiety in children with HAE and recommend prophylaxis with C1-inhibitor combined with sedation. In the presented case the protocol allowed prolonged dental procedures with good cooperation and without episodes of edema or intra or postoperative complications.

Conclusions: dental management of patients with HAE requires a multidisciplinary approach that takes into account clinical history and anxiety level, which is often underestimated. The adopted protocol made it possible to perform multiple treatments in a few sessions safely and without complications.

SINGLE-AGENT SEDATION FOR BEHAVIORAL MANAGEMENT IN PEDIATRIC DENTISTRY: AN UMBRELLA REVIEW OF AGENTS, ROUTES OF ADMINISTRATION, PROVIDERS, AND CLINICAL SETTINGS

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Aim: to synthesize evidence on the efficacy and safety of single-agent sedation, excluding deep sedation and general anesthesia, for behavior management in pediatric dentistry, and to assess the influence of route of administration, clinical setting, and the type of healthcare provider performing sedation.

Methods: an umbrella review was conducted following PRISMA guidelines and registered in PROSPERO (CRD420251043738). Systematic reviews on pediatric dental sedation using a single agent were searched across major databases up to March 2025. Eighteen systematic reviews were included and qualitatively synthesized.

Results: a total of 18 systematic reviews, including 97 primary studies and 6877 children, were analyzed. Fourteen sedative agents administered through eight routes were identified. Single-agent sedation was generally effective and safe for behavior management and treatment completion. Midazolam and nitrous oxide were the most investigated agents. Differences in onset, recovery, cooperation, and adverse events were observed across routes. Clinical setting and provider type influenced agent selection and outcomes, while data on acceptability and satisfaction were limited.

Conclusions: single-agent sedation represents a reliable approach for behavioral management in pediatric dentistry when performed in appropriately monitored settings. However, heterogeneity across studies limits direct comparisons, highlighting the need for further research on patient-centered outcomes.