

# Pediatric Dentistry

## Age and curricular differences could influence clinical knowledge and perception of molar incisor hypomineralisation amongst dental professionals

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**Aim:** This study investigated the relationships between age, gender, cultural background and subspecialty of dentistry practiced in a group of Italian dentists and their general knowledge of clinical and epidemiological aspects of Molar Incisor Hypomineralisation.

**Methods:** Multiple choice questionnaires were distributed to a population sample of 398 dentists belonging to ANDI (Italian Association of Dentists), Bologna section. These questionnaires were previously validated and the data retrieved were compared to previously published data.

**Results:** Response rate was 63.0% (251/398). 19.1% of respondents had a dual MD-DDS degree; dentists with six years medical training-only represented 20.7%; Dental Program graduates = 45.4 %, Dental Program graduates with 1-2 year Masters degree = 14.7%.. Results from personal data evidence that mean age is  $47 \pm 11$  years, gender is 70% males, 36% of the population practiced for over 25 years. The majority of the respondents (85.7%) had encountered MIH clinically and 21.1% stated that MIH prevalence appears to have increased since 2001. 39.8% of the sample observed MIH affected individuals on a monthly basis. Genetic causes and antibiotic treatment to mother and/or child were mentioned as the main aetiological factors. Further information about MIH aetiology and treatment was requested by 92.4% of the sample.

**Conclusions:** Our sample showed the influence of age/gender and to a lesser extent of curriculum on MIH knowledge. Need for diagnostic and therapeutical training was a 75% majority of all responders (49.3%

in the model questionnaire previous data); particularly 14% of the sample asked for updates on therapeutic strategies.

## Evaluation of an imaging software for 3D rendering of deciduous teeth

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**Aim:** To evaluate the performance of a three-dimensions (3D) imaging software (3D Slicer) developed for medical surgeons, in the 3D rendering of images of deciduous teeth made by CBCT. 3D Slicer is an open source platform for segmentation, registration and 3D visualization of medical imaging data. Slicer started as a research project between the Surgical Planning Lab (Harvard) and the CSAIL - Computer Science and Artificial Intelligence Laboratory (MIT). So far this software has never been used for evaluating root canal anatomy in dentistry and more specifically in paediatric dentistry. Therefore we wanted to explore its possibilities to clearly visualize the external root surface of deciduous teeth and the relative canal configuration in three-dimensions.

**Methods:** Clinical CBCT images were used for the study, selecting scans previously taken for other purpose (e.g. impacted canines, odontoma) in which deciduous teeth were present. The CBCT scan had been obtained with the consent of the parents for the specific therapies. The age of young patients ranged from 6 to 14 years old . To use 3D slicer, some changes in the use and in the procedures had to be made. First import the DICOM file into software. Then crop volume for single

tooth visualization, so do the segmentation selecting a satisfying threshold. Eventually edit the segment created for remove the aberration.

**Results:** Results are shown by pictures, illustrating the possible achievement: root anatomy including resorption, root canal anatomy, intracanal navigation, measurements. In addition is possible export created surface in .stl file (stereo lithography). With .stl file, for example students can navigate with a stl viewer application, even on their smartphone. Furthermore is possible with 3D printer make model that show root resorption and difference between anatomic apex and apical foramen.

**Conclusion:** 3D rendering of deciduous teeth is an interesting diagnostic and teaching tools in pediatric dentistry. The available software, even though is not specifically developed for tooth rendering, it can be used for do this and excellent results can be achieved. However it must be underlined the fact that the suggested modifications are custom made and require computer skills and knowledge to be applied. Moreover they are time consuming. Therefore the hope is that in future new specific software for dentistry could be developed, to make 3d rendering more easy and rapid to perform.

### Early onset of oral abnormalities in a case of dyskeratosis congenita

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**Aim:** Dyskeratosis congenita (DC) is a rare, hereditary disease, which was first described by Zinsser in 1906. Later Engman and Cole et al reported other cases in detail and hence it is also known as Cole-Engman syndrome or Zinsser- Cole-Engman syndrome. DC occurs mostly in males and manifests between 5 to 12 years. Classic triad of skin pigmentation, nail dystrophy and oral leukoplakia occur in complete expression of this syndrome. Leukoplakic lesion is not uncommon in clinical practice but its occurrence as a component of a syndrome is rare. DC is a fatal condition in which majority of the patients develop aplastic anemia and malignant transformation occur in the keratotic white patches which is of considerable interest to a dentist. It is important for dentists to now about this condition as these leukoplakic lesions can spontaneously undergo malignant transformation; bone marrow involment with pancytopenia, oral and dental abnormalities may be present. Majority of cases have been reported in

dermatology or pediatrics literature whereas only few reports have appeared in dental literature.

**Case Report:** A case of 21 months old baby is reported. At the age of 1 year a cronic asintomatic lesion of the tongue with papillary atrophy appeared. The boy was then referred to a pediatric dentist for oral evaluation: hair, nail and cutis were normal in aspect, but many oral lesions were noticed. Oral lesions consisted of extensive tongue erosions and keratosis with no hematological compromise. At that time a biopsy was decided and resulted in a diagnosis of leukoplakia. Four months later the patient developed aplastic anemia so, at that point, a genetic test to evaluate the diagnosis of Dyskeratosis Congenita was performed and a DKC1 gene mutation was confirmed. The patient underwent allogeneic bone marrow transplantation and was included in a oro-dental follow-up program to monitor the oral situation. The ortopantomography performed at the age of 4 years evidenced the presence of all the germs of the permanent teeth in normal stage of development and eruption, with no abnormalities in shape or position. No signs of bone lesions and/or dental caries were present. Currently the patient is on immunosuppressive therapy and is and periodically evaluated to monitor the hematologic situation and the oral conditions.

**Discussion:** Dyskeratosis Congenita (DC) is a rare pathology and requires a multidisciplinary approach. Development oral leukoplakic lesions, dental decay, hypodontia, aggressive periodontitis and intraoral brown pigmentation have been reported in literature. Furthermore, these patients are at high risk to develop oropharyngeal squamous cell carcinoma. The purpose of reporting this case is to create better awareness among dentists about the multisystem manifestations and oro-dental abnormalities of this fatal condition that can aid clinicians in early diagnosis.

**Conclusion:** Dentists should be able to recognize this condition in its early stages and advice appropriate hematological investigations; they could be the first to see and diagnose Dyskeratosis Congenita and have an important role in monitoring the oral malignant changes in the mucosa. For all these reason routine dental follow-up, hematological investigations and periodic biopsies are strategic in the management of such patients.

### Halitosis, salivary b-galactosidases and oral health status in children who practice sport

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**Aim:** The aim of this work was to evaluate the association

among halitosis, salivary  $\beta$ -galactosidases and oral health status in children whose practice sport.

**Methods:** 50 children attending the first visit in the Department of Paediatric Dentistry have been included in the study. All patients were interviewed about their medical history in order to collect their anamnestic data. In particular the number of sport hours activity performed by each child per week, has been recorded. A dentist examined the oral cavity of the patients and the following clinical parameters have been recorded: number of deciduous and permanent teeth, caries (on deciduous and permanent), presence of gingivitis (0=no; 1=yes), lingual patina index (0-3), oral infections (0=no; 1=yes), oral hygiene index (0=insufficient, 1=sufficient, 2=good), presence of at least one incongruous restoration (0=no, 1=yes), oral breathing (0=no; 1=yes), fissured tongue (0=no, 1=yes), presence of aftous ulcers, herpetic lesions or candidiasis (0=no, 1=yes), food starvation (0=no; 1=yes). Halitosis measurement: The oral malodour assessment has been carried out by two trained judges that scored the air exhaled from patients' mouth, by using the organoleptic intensity scale, based on Rosenberg et al. (20), as follows: 0 = absence of odour; 1 = questionable malodour; 2 = slight; 3 = moderate; 4 = strong; and 5 = severe. The OralChroma was used to measure the VSC concentration: hydrogen sulphide, methyl mercaptan and dimethyl sulphide. The salivary  $\beta$ -galactosidases activity has been carried out both by using the colorimetric method than spectrophotometrically, as described by Petrini et al.

**Results:** Increasing the hours of sport activity, we have measured a decrement of all halitosis-related parameters. In particular the Spearman rank correlation has shown an inverse association among hours of sport/week and the level of  $\beta$ -galactosidases measured spectrophotometrically; it decreases appreciably at 3 and 4 hours of sport practiced/week. The same trend has been confirmed also for  $\beta$ -galactosidases activity measured through the colorimetric method. Interesting was that, children whose practiced more sport hours/week were characterized by a minor patina index, prevalence of gingivitis and organoleptic value. These data have been confirmed also by the positive correlation among sport activity performed each weeks and the level of oral hygiene: children whose practiced more sport were characterized by a better oral hygiene and lower levels of H<sub>2</sub>S in the exhaled air measured at the Oralchroma.

**Conclusions:** Children whose practiced more sport were characterized by a minor incidence and severity of halitosis, a better oral hygiene and a minor prevalence of gingivitis.

### Amelogenesis imperfecta: a non-invasive approach for improving aesthetics in young patients. A report of two cases

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**Aim:** To evaluate aesthetic and functional efficacy of infiltrant resin (Icon, DMG Amburgo, Germany) in Amelogenesis Imperfecta's treatment in patients complaining on the white opacities and on the yellowish discoloration of their anterior teeth.

**Methods:** In this case report, enamel opacities in adolescent patients affected by moderate Amelogenesis imperfecta (hypomatured phenotype) are analysed. In the two cases, all teeth, in particular superior central incisors, show diffuse and demarcated white opacities, especially located on the incisal half of the buccal surfaces. The first patient, G.S. (13 years old) affected by moderate AI hypomatured type, was treated, using Icon resin protocol. Before starting the treatment, teeth were cleaned using a prophylaxis paste (Proxylt, RDA 7, Ivoclar, Vivadent AG, Schaan, Liechtenstein) and any cleaning residue was removed with water spray. Teeth from the second right premolar to the second left premolar of the upper jaw were isolated with a rubber dam and buccal surfaces were prepared applying 15% HCl gel (Icon-Etch) for 2 minutes. Afterwards, the gel was rinsed with water for 30 seconds and the teeth were air-dried. Icon-Dry was then applied and subsequently left for 30 seconds to dehydrate the enamel surface; teeth were air-dried once again. A second application of the HCl gel on the whole buccal surfaces was performed, followed by a third application only on the white demarcated lesions of the central incisors, since lesions were not fully etched after the second application of the gel. Icon-Infiltrant was applied and left on the whole buccal surfaces for 3 minutes, light-cured for 40 seconds, than applied a second time for 1 minute and light-cured again. Finally, surfaces were polished using silicone points. The other patient, C.M. (15 years old), affected by the hypomaturation type of Amelogenesis Imperfecta, was treated using Icon resin after a bleaching protocol. At the first appointment, the follow protocol was applied: teeth were isolated with a rubber dam and enamel defects were covered with a liquid dam to avoid their further whitening and Philips Zoom WhiteSpeed Light-Activated Whitening System was used (3 applications of 15 minutes each in one sitting). After 1-week, the Icon resin protocol was carried out: the same procedure described above was used again, except for HCl gel that was applied only two times on the whole buccal surfaces. Both cases were followed-up on the sixth and twelfth months. Pictures were taken following a standardized procedure.

**Results:** Treated teeth show an excellent aesthetical result immediately after the resin application, effect that lasts in the long-term (six and twelve months follow-up examinations); the dental wear's progression seems to be clinically arrested.

**Conclusions:** Resin infiltration has proven to be a minimal invasive possible treatment for dental discolouration, less aggressive than conventional procedures. This approach might be recommended for a stable aesthetical improvement in moderate AI's lesions especially in young and very young patients.

### The role of dental hygienists in primary school. An awareness campaign for oral health and nutritional education

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**Aim:** Dental caries and gingivitis represent two high incidence diseases in Italy, in pediatric age. In particular, dental caries show an increasing prevalence age-related: the 21,6% of the 4-5 years old population is affected, while almost the 90% at the age of 25. These data are the effect of an overconsumption of sugar not restricted to the main meals, of a superficial knowledge of the dental care rules and of sporadic dental visits. Such an evidence is connected also with the familiar background (especially related to parents habits). Prevention strategies must aim mostly to the transmission of the idea that the mouth is a primary importance body organ. In addition, understanding the etiological factors which lead to dental caries and periodontal disease is essential. This mission must be carried out by means of dissemination and motivational meetings that may arouse children curiosity and interest. The aim of this study is the record of mouth awareness level and the evaluation of nutritional and oral habits of 170 children.

**Method:** The children were from 8 to 10-years old and they underwent a first test (23 questions taken from the ministerial program iDENTikit). These children attend 4 different elementary schools in Rome; two of them are located in the center of the city: Altamura school and Borromeo Institute; the other are from suburbs: Tito Tempesta Institute and Casalotti School. The same students underwent a hygienic and nutritional education program, conducted by videos and interactive lessons in class, with the presence of a group of dental hygienists. After a month, the same children underwent a second test, made of 4 questions, prepared by the same group of dental hygienists, with the aim of evaluating possible children improvement in habits and dental knowledge.

**Results:** It came out that the most of the children, from all the school in exam, wash their teeth before going to school in the morning, not just because they are well aware of the importance of their own oral hygiene but also because of social and relational motivations

(relationship with teachers and schoolmates). This almost generalized attitude shows how oral hygiene has an important impact on social relations and how these relations motivate the students to maintain a correct oral hygiene level. Children attending schools from the city center had already a good knowledge of the caries disease and a good attitude in oral hygiene, thanks to specific education programs attended in the previous years. Differently, in suburbs schools, children gave a lower number of right answers in both tests. The results demonstrate that in the central schools there has been an improvement in dental knowledge.

**Conclusion:** Although students from the city center strongly improved their oral knowledge, however children from suburbs showed to have learned new things about oral and dental health. Despite the different program success percentages, the educative program raised curiosity and interest in all the participants, pointing out best scores in the second test.

### Acrylic splint treatment in the upper arch for functional repositioning of the mandible after unilateral superior condylar neck fracture with dislocation

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**Aim:** Although the glenoid fossa provides good protection for the condyle, condylar fractures are still quite common. The purpose of this study is to analyse the outcomes of a case about an unilateral mandibular condylar neck fracture with dislocation.

**Method:** A 11-year-old female, referring to the Multidisciplinary Department of Medical-Surgical and Odontostomatological Specialties of the Second University of Naples, suffered from facial trauma. Her chin showed an hematoma, and she complained of monolateral temporomandibular joint (TMJ) pain. After an intraoral examination revealed dental class I, with crowding, overbite 3 mm, overjet 2 mm, and normal mouth opening, but mandibular deviation to the right side was observed during opening, closure, and mastication. A computed tomography (CT) scan showed a complete superior right condylar neck fracture with medial dislocation of the condyle, and lateral dislocation of the ramus. We decided to treat the patient with an acrylic splint for functional repositioning of the mandible. The acrylic splint was placed in the upper arch to restore the functional repositioning of the mandible. The splint's height was gradually increased by 2 mm in two times for a total thickness of 5.5 mm, to stimulate

growth on the deficient side of the fracture. The total treatment time was 16 months. During treatment, clinical checks consisted of observation of signs and symptoms related to the temporomandibular disorder, including joint pain on palpation, mandibular range of motion, mandibular movements symmetry, and pain on mandibular function.

**Results:** For the present case, a non-surgical functional approach was chosen. Long-term five-year follow up showed complete healing. A portion of the ramus appeared lateral with respect to the condylar head, whereas the mandibular deviation to the right side was fully corrected. After treatment, a facial examination showed improved facial symmetry with good proportions, the TMJs were pain-free, the displacement during jaw opening was resolved, and masticatory function was restored. Consolidation of the fragments and a medial alignment were obtained. There was no ankylosis and no disturbance of mandibular or facial growth. Facial examination showed improved facial symmetry with good proportions, a natural lip posture, and a more harmonious profile.

**Conclusion:** Conservative treatment may be an appropriate method for children in select cases, as they have an increased potential for spontaneous regeneration. Although this is a single case, the results and the stability in a long-term five-year follow up seem to support the effectiveness of this treatment choice for this patient. However, further studies with larger numbers of patients with similar fractures treated with the same technique are required to validate the effectiveness of this therapeutic approach.

### Microbial colonization of the surface of orthopedic devices for cleft lip and palate patients

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**Aim:** Microbial colonization of the mouth in children with cleft lip and palate (CLP) is a very important issue to be known and monitored by clinicians. In fact, the obturator plates used in CLP patients, similarly to dentures, are predisposed to the accumulation of aerobic and anaerobic microorganisms, which may lead to alteration of the normal flora either of the mouth and of the nose.

The aim of this study is to understand the microbial colonization that can develop on the surface of orthopedic devices.

**Method:** Repeated samples from the internal (IS)

and external surfaces (ES) of nasoalveolar moulding devices and maxillary gingivas (MG) of a unilateral cleft lip and palate child were taken with a sterile cotton swab, transferred into 1 ml of transport medium and immediately sent to the microbiology laboratory. Aliquots of 0.1 ml samples were 10-fold serially diluted and plated into selected media for Gram positive and Gram negative bacteria and for yeasts; after incubation at 36–37 °C for 48 hours, typical colonies were enumerated and calculated as cfu/ml. Matrix-assisted laser desorption/ionization mass spectrometry (MALDI-TOF-SM) for microbial identification was then performed. The samples were taken five times, once a month, and gingival swabs were also taken from parents.

**Results:** Oral sample swabs confirmed the presence of a variety of colonizers: *Corynebacterium amycolatum*, *Staphylococcus epidermidis*, *Enterococcus faecalis*, *Enterobacter cloacae*, *Stenotrophomonas maltophilia*, *Streptococcus gordonii*, *Streptococcus salivarius*, *Streptococcus mitis*, *Streptococcus parasanguis*, *Stafilococcus epidermidis*, *Candida lusitaniae*, *Stafilococcus aureus*. The most prevalent microorganisms were *Enterobacter cloacae*, *Streptococcus mitis* and *Candida lusitaniae*; sequential samples revealed an increasing variety of microbial species. It is interesting to note that the bacteria isolated from the MG of the child were the same of those found in the oral cavity swabs taken from the father. The presence of *Candida* in the last two samples was associated to concurrent clinical features, such as oral thrush symptoms.

**Conclusion:** The palate cleft creates communication between the nasopharyngeal space and the oral cavity, predisposing to alteration of normal flora at both sites, as observed in our study. Literature data confirm that microorganisms find excellent conditions for growth on most commonly used materials for obturator prostheses (polymethyl methacrylate), due to structural defects formed by the release of gases during the polymerization process. In addition, our result are in accordance with G. Evlioglu et al., who claim that *Candida* spp. and *Stafilococcus aureus* biofilms may easily colonize obturator prostheses and are more resistant to antimicrobial treatment than planktonic cells, individually. In this study we found that *Candida* species localized on the surface of the obturator plates have led to symptomatic thrush. These important medical consequences require appropriate risk management, including the need for prophylactic treatments. In conclusion, more investigations should be carried to verify the hypothesis of a microbial transmission from parents to children by means of the obturators.

### Evaluation of the difference in caries experience in diabetic and non-diabetic children - A case



## control study

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**Aim:** Evaluate the difference in caries experience and different caries-related variables between diabetic and non-diabetic children. A further analysis was carried out on diabetic children after they were divided in two groups based on their metabolic control.

**Method:** A total of 204 individuals participated in this study: 68 children diagnosed with type 1 diabetes and 136 non-diabetic control children. Diabetic children were then divided in: a) 20 children with adequate metabolic control ( $Hb1ac \leq 7.5$ ) and b) 48 children with poor metabolic control ( $Hb1ac > 7.5$ ). Data on dietary and oral habits were collected by a self-compiled questionnaire. Saliva samples were carried out after chewing a piece of paraffin for 5 minutes. Genomic probes were prepared from 10 bacterial strains and analyzed using the checkerboard DNA-DNA hybridisation method. Plaque acidogenity was recorded using pH indicator strips up to 30 min after a sucrose rinse. ICDAS index was also calculated. One-way ANOVA was used to compare mean differences in the caries experience and bacterial scores in the two groups.

**Results:** Caries prevalence varies from 54% in diabetic subjects with good metabolic control to 70% in diabetic subjects in bad-metabolic control; no statically significant difference in caries status was found in the two study groups. No statistically significant difference was found for tooth brushing frequency, use of fluoridated toothpaste, mouthwash and other fluoride supplements and the pattern of dental check-ups between the groups examined. Plaque-pH (minimum pH, AUC6.2 and AUC5.7) was statistically different in diabetic respect to the non-diabetic children ( $p < 0.01$  or  $p < 0.05$ ) were found. The bacterial counts differed significantly between diabetic and non-diabetic subjects regarding *S. Mutans*, *S. Sobrinus*, *L. Salivarius* and *L. Fermentum* ( $p < 0.05$ ).

**Conclusions:** Type 1 Diabetes Mellitus patients showed a more cariogenic bacterial environment and a direct effect on plaque pH reducing it from normal levels was detected.

## Use of an infiltrant resin for molar and incisor hypomineralization (MIH) treatment

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**Aim:** To evaluate the effects of an infiltrant resin, Icon, on in vivo functional treatment of MIH-affected first permanent molars (FPMs). The tested hypothesis was that Icon would improve the surface roughness of these teeth and reduce MIH-related hypersensitivity.

**Methods:** The study was designed as a preliminary observational in vivo study. 10 underage subjects were enrolled according to specific inclusion criteria and patients' parents signed the informed consent. 15 MIH-affected FPMs were treated with Icon according to the protocol recommended by the manufacturer. Patients were evaluated at the following intervals: before treatment (T0), immediately after treatment (T1), at 10 days, 1, 2 and 3 months after treatment (T2, T3, T4 and T5 respectively). At each follow-up a polyvinylsiloxane (PVS) precision impression and photographs of the teeth were taken. Any variation of teeth clinical aspect and of patients' dental hypersensitivity (according to the Visual Analogue Scale, VAS) were recorded over time. At T5 patients' parents were asked to fill in an anonymous assessment questionnaire. Epoxy resin replica obtained from the PVS impressions were used for the profilometric and scanning electron microscope (SEM) analysis. Values of the mean superficial roughness (Sa) obtained from the profilometric analysis were analyzed using non-parametric tests.

**Results:** Statistically significant differences in terms of Sa were detected between the sound group and the MIH-affected one at T0 ( $p < 0.05$ ), T1 ( $p < 0.05$ ), T2 ( $p < 0.05$ ), T3 ( $p < 0.05$ ), T4 ( $p = < 0.05$ ) and between the MIH-affected groups at T1 and T2 ( $p < 0.05$ ). SEM analysis showed that at T1 the treated MIH-affected enamel appeared to be less porous than the pre-treated one but an increment of the superficial porosities was visible over time. No changes in color of the MIH-affected areas were observed over time in comparison to T0. The average hypersensitivity values measured with VAS were significantly reduced after treatment and remained constant over time. The questionnaires revealed that 60% of patients complained of pre-treatment hypersensitivity, especially to cold stimuli and that after treatment the symptoms improved, remaining stable over time. 60% of patients' parents considered the treatment simple and short and the totality were satisfied and would suggest it to other parents with MIH-affected children.

**Conclusions:** The results showed that Icon treatment of MIH-affected FPMs could be a valid aid in terms of reduction of porosity of the affected enamel with a consequent improvement of its micro-mechanical

properties and a reduced risk of caries and post eruptive breakdown (PEB). In addition, the reduction of the hypersensitivity and its maintenance over time improved the patients' life quality and allowed hypothesizing an effective infiltration of the material into the affected enamel and an adequate occlusion of its porosities.

### Prevention campaign: "A Smile School": prevalence of malocclusion in the pediatric population of central Rome

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**Aim:** Non nutritive sucking habits can cause orthodontic problems in children and adolescents, so it's important the prevention in order to avoid malocclusions. The early dental diagnosis of these "malpractice habits" can guarantee the correct growth of jaws. Hence the need for a monitoring to define the trend of the growth and to provide educational programs that promote good behavioral habits.

**Method:** In this view The U.O.C. of Pediatric Dentistry, Policlinico Umberto I in Rome (Dir. Prof. Antonella Polimeni) sponsored by the second municipality of Rome, have promoted, for the current school year, dental examinations to pupils in nursery classes, primary and secondary, a 'between the ages of 3 and 13 years old, carried out at school, trained by dentists, with the use of sterile disposable material (dental probe and mirror) and clinical detection folders that include: questionnaire addressed to parents about current orthodontic treatments and behavior habits of their children and personal data; a detection folder for orthodontic parameters. Parents were issued a letter of accompany with the medical observations. For each child was asked consent to the visit and processing of data.

**Result:** The examined sample of 372 children, 202 males and 170 females. Among these, currently 74,73% never did an orthodontic therapy, 15,59% are in orthodontic treatment in this year and only 1,34% have just finished the therapy. The objective intraoral exam underlines these respective classes of Angle malocclusion: the 49,52% of the examined children are in first class, 39,52% are in second class and 11,43% are in third class. About the dental vertical diagnosis 81,82% of the sample have increased overbite and 18,18% have decreased overbite. Instead, if we focus on the dental sagittal examination, the 91,43% of the sample have

increased overjet and the 8,57% have decreased overjet. Among these, the 7,53% have the bad habit of thumb sucking and the 29,30% use the pacifier even now.

**Conclusion:** The major orthodontic disorders of the sample are related to non nutritive sucking habits presented in their medical history. The early screening and interceptive orthodontic treatment can modify the tendency of growth of jaws in childhood in order to restore occlusion.

### Oro-facial-digital syndrome: case report

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**Aim:** The Oro-Facial-Digital Syndrome (OFDS) is a term indicating a group of apparently different diseases, linked by oral, facial and digital malformations. Nine different subtypes have been identified. They are based on a variety of clinical findings, such as facial deformities, including low nasal bridge, broad nasal tip sometimes slightly bifid), hypertelorism, hypoplasia of zygomatic arch and maxilla, and micrognathia. Digital malformations include polydactyly, clinodactyly, brachydactyly, syndactyly, camptodactyly and extra fingers. Some other manifestations include various kidney diseases. The most common oral features reported in OFDS are hyperplastic oral frenula, median cleft lip, pseudocleft of the upper lip, cleft palate, lobulated or bifid tongue, tongue nodule, lingual hamartoma, high-arched palate and, with regards to dental involvement, dental caries, anomalous anterior teeth, enamel hypoplasia, supernumerary teeth and multiple agenesis. Apart from these, further manifestations have been described, such as microglossia, ankyloglossia, T-shaped canine crown form, tooth fusion, dental infraocclusion, missing mandibular lateral incisors, small or hypoplastic mandible with a short ramus, and an extended bony ridge from the alveolar crest medially to the midline in the canine premolar area.

**Method:** In this case report, we describe the clinical oral features of a young Caucasian girl reporting the diagnosis of OFDS. She occurred for the first time to our Dental Clinic at the age of 9 years and 2 months, and has been treated and followed up until the end of her growth.

**Results:** At the first clinical examination, she presented brachydactyly, clinodactyly and camptodactyly of the second and third finger of right hand and of the right foot, plus valgus feet. Kidneys were normal in size and function, but the right one was rotated. We



recorded dimensional abnormalities of the facial bones with underdeveloped left half face, basal and alveolar hypoplasia of the maxilla. Malocclusion consisted in a dental-skeletal class III (ANB,  $-1^\circ$ ) with a retrognathic condition (PNS-A, 38.9mm). She also reported hypertrophy of the upper labial median frenulum and a short and hypertrophic lingual one. The patient was in the primary dentition stage of development. The oral hygiene was reasonable, and the patient was caries free. Subsequently, in permanent dentition, in the lower arch there was a normal development of all teeth, except the right first permanent molar, which was impacted and ectopic, as confirmed by the dental orthopantomogram. In the upper arch there were numerous impacted and ectopic rudimentary teeth with ankylosis, so the traction failed and they were extracted.

**Conclusion:** When facing a complex developmental disorder involving several body districts, a multidisciplinary approach is required. In this case of OFDS, dentists have to face different challenging aspects from skeletal defects, to dental abnormalities. In order to improve the quality of life of these patients, surgical supernumerary and impacted teeth extraction and the control of the dental hygiene are the prerequisites to a successful rehabilitation, although some other characteristics, like hyperplastic frenula and decreased alveolar ridge height and width, increase the difficulty to design and fabricate adequate removable prostheses to replace missing teeth.

### Prevention campaign: "A Smile School": prevalence of dental caries in the pediatric population of central Rome

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**Aim:** Tooth decay is a disease closely related to eating habits and lifestyles, easily correctable in the child and adolescent population. Indeed, it is remarkably widespread among the Italian population. Hence the need for a monitoring to define the trend of the disease and to provide educational programs that promote good eating habits and oral hygiene.

**Method:** In this view The U.O.C. of Pediatric Dentistry, Policlinico Umberto I in Rome (Dir. Prof. Antonella Polimeni) sponsored by the second municipality of Rome, have promoted, for the current school year, dental examinations to pupils in nursery classes,

primary and secondary, between the ages of 3 and 13 years old, carried out at school, trained by dentists, with the use of sterile disposable material (dental probe and mirror) and clinical detection folders that include: questionnaire addressed to parents about hygiene and eating habits of their children and personal data; a detection folder for caries and periodontal disease with plaque index for home oral hygiene assessment. Parents were issued a letter of accompany with the medical observations. For each child was asked consent to the visit and processing of data.

**Result:** The examined sample of 372 children, 202 males and 170 females. Of these, 74.19% did not carry out any kind of additional fluoride further home care by toothbrushing. By clinical observation on sample, 40.05% had absence of plaque, plaque detectable to the probe in 27.69%, the 18.1% seen with the naked eye plaque and 10.48% abundant accumulations of plaque. Bleeding on probing was present only in 9.41%. The DMF is 0.7 and def 0.6. Compared with the data relating to the parents education, 69.62 of mothers graduated and 62.91 of the fathers, the remainder is split between middle and high schools, no one do not appear any kind of education.

**Conclusion:** Sample thus far examined has a satisfactory level of oral health with a DMF of 0.7 and a def of 0.6 or less than 1. However, the WHO goals for 2020, we recall, promote between 5 and 6 years old subjects free from tooth decay, so prevention and oral health promotion campaigns in these age groups are necessary to achieve that goal not yet reached.

### Preventive dental and orthodontic approach to transposition. A case report

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**Aim:** The goal of this work is to briefly present teeth transposition and describe a successfully solved case in "Sapienza" University of Rome, U.O.C. Pediatric Dentistry. Tooth transposition is a severe positional anomaly, affecting 0.4 % of the population, that may create many orthodontic problems from both esthetic and functional points of view. Dental transposition is defined as the positional interchange of two adjacent teeth or the development or eruption of a tooth in a position normally occupied by a non-adjacent tooth. The maxillary canine is the most commonly involved teeth in the transposition, changing its eruptive place with the lateral incisor or the first premolar in most cases. In such canine transposition the treatment options may include alignment of the teeth in their transposed positions, extractions of one of transposed

teeth, orthodontic movement into the correct position in the arch. The treatment options was decided with careful consideration of the multiple clinical variables: stages of development and position of root apices, facial esthetics, dental morphology, occlusal consideration, treatment time, age and compliance of the patient.

**Methods:** Many publications reporting people with maxillary tooth transpositions were examined from word-wide sources. This paper presents a case report demonstrating the preventive orthodontic management of a mandibular transposition in a girl 9 aged years. The panoramic radiograph of the early mixed dentition, is a very useful source for detecting the presence and position of the unerupted permanent teeth. The best time to begin assessing a child for potential tooth transposition is the early mixed dentition period, around the age 6 to 8 years. In this case panoramic showed an incomplete mandibular lateral incisor-canine tooth transposition which caused lack resorption 8.3 and eruptive obstacle of 4.3 and 4.4.

**Results:** Early interceptive procedure has provided the placement of a lingual arch to preserve arch length, followed by the extraction of the deciduous tooth, and placement of eruption guider for the permanent teeth, thus preventing complete development of the anomaly. This allowed teeth to became upright and erupt into its proper position in the arch.

**Conclusions:** Transposition of teeth in an uncommon dental anomaly. The interceptive treatment of the transposition in the early mixed dentition of pedodontic patient simplified the corrective orthodontic treatment, making it faster and less complex, how to cited in others studies.

### Early orthodontic treatment of Class II malocclusions with no-compliance appliances: study project with Forsus device system

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**Aim:** Class II malocclusion is considered as a sagittal discrepancy between the maxillary bases characterized by a protrusion of the maxilla and/or a retrusion of the mandible. There are several therapeutic approaches where the most suitable choice depends, for example, on the different level of patient's cooperation. During childhood, the most used appliances for Class II malocclusion are the removable functional devices that need a good patient's cooperation to be successful. The aim of this study was to evaluate the dental-alveolar and skeletal effects of an interceptive orthodontic treatment with a mandibular propulsive orthodontic appliance named Forsus in Class II growing patients with lack of

compliance for functional appliances.

**Methods:** A group of growing patients was selected to be treated with Forsus device following inclusion and exclusion methods. Some inclusion methods were: Class II malocclusion, OVJ more than 4 mm, stage of vertebral development Cs2-Cs3, lack of compliance for functional appliances. Some exclusion methods were though: permanent dentition, stage of vertebral development Cs4, presence of temporary mandibular disorders. The device wasn't associated with a multibrackets orthodontic therapy but it presented a new design studied to be applied in mixed dentition. The telescopic system of Forsus device, that consists of a pushrod inside a Ni-Ti spring, was combined with a palatal arch and a double mandibular ferule. The upper and lower first molars presented orthodontic bands. The telescopic system connected the maxilla to the mandible from distal to mesial having contact, respectively, with the vestibular tubes of the upper first molars and with the mesial stops located in the vestibular sides of the mandibular ferule, at the level of the interproximal zone between canine and first deciduous molar or first premolar. A first patient was chosen to be treated to evaluate the effectiveness of the therapy with this new design, to underline both strengths and weaknesses of the therapy. A complete photographic intraoral record was carried out before installation of Forsus device as well as during the different stages of the treatment. Cephalometric radiograph analysis was taken before therapy and at the completion of comprehensive therapy. A comparison between initial and final digital study models was as well realized. The treatment lasted 8 months.

**Results:** The overall therapeutic effects were mainly dento-alveolar while the skeletal effects were less significant as a slight improvement of ANB angle from 7,7° to 5,4°. The overjet decreased significantly from 7,1 mm to 3,2 mm and the overbite from 4,5 to 0,1. A new molar relationship of Class 1 of Angle was achieved.

**Conclusion:** Forsus device is a valid option of no-compliance interceptive orthodontic treatment in Class II growing patients. Although the therapy had mainly dento-alveolar effects, it will be possible to achieve more skeletal effects for example taking care to apply the device for the whole period of the peak of growth.

### Complex and compound odontoma: case reports

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**Aim:** Odontomas are a type of mixed benign tumors

which originate from the dental lamina. They sum up to 22.6% of all odontogenic tumors. There are two types: complex and compound. The majority are asymptomatic and have a slow growth, though the exact etiology is still unknown. The postulated causes include: local trauma, infection, inheritance and genetic mutation or predisposition. Radiographically they present themselves like osteolytic lesions with sclerotic outline. They are masses defined depending on the type of odontoma under observation. The compound odontoma shows distinct denticles whilst the complex odontoma presents a radio-opaque undefined mass usually including all three dental tissues. Histologically the complex odontoma displays an irregular distribution of immature enamel, dentine and cementum; however, it has no distinct shape but presents itself as an amorphous body of varying densities. The compound odontoma, instead, exhibits a normal organization of dental tissue in the form of multiple "denticles" all surrounded by a fibrous capsule.

**Method:** We present two case reports in children, both male, of 12 and 6 year of age. The youngest child came to our observation with a compound odontoma in zone 8.1- 7.2. The presence of the odontoma was hampering the normal eruption of the permanent teeth (3.3- 3.2- 3.1) and could possibly endanger the inferior alveolar nerve. The eldest child presented a complex odontoma in zone 2.1-2.4 which hindered the normal eruption of 2.3. Treatment consisted of surgical excision of the odontomas and involved the extraction of the primary teeth for both patients. Given the age and the location of the lesion, a general anesthesia for the youngest boy was organised. The eldest boy was treated in local anesthesia without any compliance issue.

**Results:** The excision of both lesions healed without complications. The youngest child was treated with conservative surgical removal of odontoma and kept under observation for spontaneous eruption of the unerupted frontal incisor group; then we proceeded with orthodontic therapy, to gain space and recondition the occlusion. In the eldest child the 2.3 was put under traction in order to favor its eruption through the aid of an orthodontic appliance. We are currently keeping the patients under follow-up, in order to control the results of the therapy.

**Conclusions:** If the odontomas are not removed they cause retention and inclusion of teeth, progressive osteolytic lesion and possible damage to the developing dental germs. In both cases reported, the surgery approach makes the eruption of permanent teeth possible. In the case of very young patients, if the odontoma presents itself without disrupting any physiological process, it is possible to apply a wait-and-see therapy and eventually remove the lesion at a more collaborative age.

## Plunging ranula in pediatric patients: a case report

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**Aim:** Ranula is a pseudocyst of the sublingual gland resulting from retention or extravasation of saliva from a gland. Two varieties are described. The first one is the superficial ranula, also known as "Oral Ranula"; the second one is the cervical ranula also known as "Plunging Ranula". The plunging ranula is located below the mylohyoid muscle and, in few cases, it can extend itself to the neck. When the cyst crosses the mylohyoid muscle it may be present as a swelling in the upper part of the neck. Often the etiology of this pseudocyst is unknown but some studies based on clinical findings and supporting data from the literature affirm that the plunging ranula has a genetic origin.

**Methods:** In this article, a Plunging Ranula is reported in a young patient. A ten-year-old male complaining of swelling in the midline neck, right-submandibular region, was reported to our department of pediatric dentistry. After palpation, a painless and fluctuating fluid-containing mass was evaluated. The mass was round in shape and had an hard-elastic consistency, while the lining mucosa had a normotropism. Intraoral examination showed a confined round swelling of fibrous consistency, with sharp and regular margins and large about 4 cm.

**Results:** The lesion was decompressed with an oral approach, without recurrence. Initially the patient was requested to undergo weekly follow-ups; after a year, they became monthly. Presently the patient is doing well.

**Conclusion:** Few cases of plunging ranula occur in pediatric patients; in addition, the lesions are often misdiagnosed. Diagnosis is not always easy as other cervical cystic lesions may have the same clinical aspect. The type of salivary gland lesions are different in their distribution in specific sites in the major and minor salivary glands in children compared with adults. Also a simple ranula can grow in time in an acute fashion, resulting in an airway obstruction. Etiology, differential diagnosis and surgical management are still discussed. Recurrences are mainly due to the unfamiliarity with this phenomenon and ignorance of its etiology. Excision of the ranula via intraoral approach is the optimal treatment for a plunging ranula as long as we keep a strict follow up. The magnetic resonance is a necessary clinical exam to be performed to evaluate the extension of the lesion.