

## Oral Communications

### RESEARCH STUDIES

#### 9. PREVALENCE, SEVERITY AND ETIOLOGICAL FACTORS INVOLVED IN MOLAR INCISOR HYPOMINERALIZATION IN A SAMPLE OF CHILDREN IN CASTELLON AGED 8 TO 12 YEARS

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*Introduction and objectives:* In recent years an increase in the prevalence of molar-incisor hypomineralization (MIH) has been observed. It is a disturbance with a systemic origin and its etiology is unknown. It affects the quality of the enamel of one or up to four permanent first molars and commonly involves the permanent incisors. The enamel affected is softer, brittle and porous, and it is often associated with decay, wear or fractures, as well as an increase in mechanical and thermal sensitivity. The aim of this study was to determine the prevalence, severity and possible etiological factors of MIH in a sample of children from Castellón between the ages of 8 and 12 years.

*Methods:* A cross-sectional, descriptive and correlational study was designed. The sample was made up of 630 school-children. Variables were studied that were related to the main pre-, peri- and postnatal etiological factors referred to in the literature, obtained from a questionnaire completed by the parents and variables obtained from the oral examination performed on each child. For the detection of MIH lesions, the diagnostic criteria of the European Academy of Pediatric Dentistry (EAPD) were used. The severity of the lesions was established using the Mathu-Muju and Wright index and the DEF-T and df-t indexes were used to assess decay.

*Results:* The prevalence of MIH in the sample was 21.9% and only a history of perinatal hypoxia was a factor positively associated with the development of MIH lesions ( $p = 0.033$ ). According to the Mathu-Muju and Wright index, 22.3% of the teeth examined presented mild MIH, 44.67% moderate and 33% severe. The presence of MIH in a tooth makes it significantly ( $p < 0.001$ ) more susceptible to the development of decay. Children with HPSM in primary second molars had, with significantly higher frequency ( $p < 0.001$ ), MIH lesions in the permanent dentition.

*Conclusions:* 21.9% of the population studied had mainly moderate and severe MIH. Perinatal hypoxia seems to be a factor positively associated with the development of MIH lesions. The most affected tooth was 1.6 and the dental surface occlusal. In addition, the teeth affected by MIH were more susceptible to the development of carious lesions. The presence of HPSM in the primary dentition can be a valid predictor of MIH in the permanent dentition.

#### 15. ORAL MANIFESTATION OF CHILD INFLAMMATORY BOWEL DISEASE

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*Introduction and objectives:* Inflammatory bowel disease (IBD) encompasses two main entities, Crohn's disease (CD) and ulcerative colitis (UC). Both are characterized by a chronic and recurrent inflammatory condition of the gastrointestinal tract, which evolves with outbreaks of activity and remission. Oral and periodontal manifestations of IBD in children occur in about 50-80% of cases and can affect any location. The aim of this study was to become familiar with the oral manifestations in pediatric patients diagnosed with IBD and to evaluate their salivary characteristics.

*Methods:* A descriptive study was performed of the oral manifestations of patients affected by IBD who attended the Gastroenterology department and were randomly derived to the Department of Dentistry at the Sant Joan de Déu Hospital in Barcelona. The assessment was carried out using a survey with the patient's medical data and a dental examination performed by the same examiner. To measure pH (normal 7-7.4) and stimulated salivary volume (normal 6 ml/5'), the Saliva-Check Buffer<sup>®</sup> test was used.

*Results:* 35 patients, with no gender differences and a mean age of 13 years (range 8-18) were reviewed, of whom 19 (54.2%) had CD, 15 (42.8%) UC and one patient (2.8%) unclassified IBD. Sixty percent of the patients evaluated were in remission stage, 25.7% were onset and 14.2% had IBD activity. Patients with CD received treatment mainly with biological drugs (73.6%), also associated with immunomodulators (52.6%); and the patients with UC 73.3% with salicylates. The oral manifestations diagnosed in the oral mucosa were: chapped lips 37% (n = 13), oral ulcers 8.5% (n = 3), leukoplakia 3% (n = 1) and geographic tongue in 3% (n = 1). 57% had moderate gingivitis, coinciding with the onset or activity of inflammatory bowel disease. With regard to the teeth, 17.5% (n = 6) of the patients were affected by Molar-Incisor hypomi-

neralization. From the overall sample, 16 patients presented basic salivary pH (9 CD-7 UC), 13 acid pH (8 CD-5 UC) and 6 normal pH. Regarding the total volume of stimulated saliva, the values were normal (8.2 ml CD and 7.3 ml UC).

**Conclusions:** In this preliminary study of oral manifestations in pediatric patients affected by IBD, moderate gingivitis was the most prevalent periodontal condition, with a wide variety of salivary pH, but with normal values of stimulated saliva flow.

## 21. ASSOCIATION BETWEEN ORAL HEALTH STATUS AND HEREDITARY FAMILY HISTORY IN SCHOOL CHILDREN

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**Introduction:** The World Health Organization (WHO) defines oral health as the absence of diseases and disorders affecting the mouth, oral cavity and teeth. It is believed that there is a relationship between oral health and hereditary family history, since certain chronic pathologies have a greater impact on oral health, and some oral diseases cause systemic damage. The chronic-degenerative diseases are hypertension, obesity, diabetes, osteoarthritis, cancer, chronic obstructive pulmonary disease and kidney disease. The symptoms and limitations are associated with deterioration in quality of life. During 2013 the main causes of illness in Baja California Mexico were high blood pressure, diabetes mellitus and obesity. Diabetes mellitus increased by 17.54%, high blood pressure decreased by 29%. A study in Europe on children with diabetes aged 10 to 15 years, the prevalence of gingivitis was 27% in the 350 children assessed. Similarly, there are reports of a higher incidence of dental plaque and stones in diabetic children.

**Objective:** To identify the association between oral health status and hereditary family history in schoolchildren.

**Methods:** The study was carried out in schoolchildren in Tijuana, Baja California. Mexico and it had an observational, descriptive, cross-sectional design. Children enrolled in 10 public elementary schools were included, following informed consent and signed permission by the children. A clinical inspection of the oral cavity was carried out using a tongue depressor and artificial light to determine the oral health status, and the healthy, decayed and restored teeth were registered. An instrument based and modified on the WHO questionnaire on chronic degenerative diseases, STEPS, was used to determine hereditary family history.

**Results:** Of 1694 children 862 (50.9%) were male and 832 (49.1%) female, and the mean age was 8.5 years. The prevalence of oral disease was 1332 (78.6%) and 362 (21.3%) were healthy children. There was a ratio of 3.67 patients per healthy child. The number of children with caries was 1144 (67.5%), restorations 354 (20.9%) and gingivitis 8 (0.5%). With regard to family history, 418 (24.6%) of the parents interviewed had a chronic degenerative disease. A statistically significant association was observed between oral health status and hereditary family history (MR = 1.635, 95% CI = 1.27, 2.09, p = 0.000).

**Conclusions:** The present study showed a statistically significant association between oral health status and hereditary family history in school children in the city of Tijuana, Baja California, Mexico.

## 47. CORRELATION BETWEEN GROWTH MARKERS AND TOOTH MINERAL CONTENT IN THE DECIDUOUS TEETH OF PREMATURE CHILDREN

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**Introduction and objectives:** The main objective was to evaluate the mineral composition of primary teeth and compare this with the growth parameters and development in children born in conditions of prematurity, in order to study the potential use of dental minerals as biomarkers of premature patient development.

**Methods:** This work is part of a multidisciplinary project, funded by the Health Research Fund. We recruited 30 children aged between 7 and 9 years, born in conditions of prematurity at the San Cecilio University Clinical Hospital, in Granada. The control group consists of 25 children of the same age, born in conditions of normality in said hospital. Patients who presented systemic pathologies or craniofacial dysmorphisms were excluded together with those with caries lesions, structural defects or restorations. The phosphorus content in the patients' primary teeth that had been shed was determined by the Fiske-Subbarow colorimetric method, while atomic absorption spectrophotometry was used to measure the concentrations of calcium, iron, magnesium, zinc and copper. To quantify the growth of the individuals in the sample, weight and height were measured, with their corresponding percentiles, tricipital, subscapular and suprailliac skinfolds, brachial circular perimeter and arm circumference. The statistical analysis was carried out using SPSS 25 (IBM®) software. Using the Student t test, the mineral content between both groups was compared. With Pearson's correlation test, the correlation between tooth minerals and markers of growth and development was analyzed.

**Results:** Significantly lower values ( $p < 0.01$ ) of P, Ca, Fe and Mg were obtained in the study group than in the control group. Regarding the content of Zn and Cu, no statistically significant differences were obtained ( $p > 0.05$ ). We found a significant correlation ( $p < 0.05$ ) between the values of P and Mg and some of the growth markers. The rest of the minerals studied showed no correlation with more than one growth marker.

**Conclusions:** The primary teeth of the premature patients presented lower concentrations of P, Ca, Fe and Mg. Of these minerals, P and Mg showed a correlation with multiple growth markers, potentially being biomarkers themselves. However, more studies are still needed to confirm these findings.

#### 48. DETERMINING ANTIBACTERIAL CAPACITY: FLUORIDE RELEASE AND POROSITY OF GLASS IONOMER MODIFIED WITH SILVER PHOSPHATE PARTICLES AND HYDROXYAPATITE

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**Introduction:** Glass ionomer (GI) is used in pediatric dentistry for treating caries. Its main characteristic is that of forming chemical bonds to teeth. It is biocompatible, releases fluoride and favors antibacterial activity, and it plays an important role in the management of patients with a high caries risk. However, its clinical durability is limited. Efforts have been made to improve its antibacterial properties by incorporating nanostructures.

**Objective:** To determine the antibacterial capacity, fluoride release and size of the porosity defect of GI modified with silver phosphate and hydroxyapatite nanoparticles.

**Methods:** Experimental *in vitro* study. The characterization of the nanostructures of silver phosphate with hydroxyapatite and GI powder was carried out by scanning electron microscopy.

- **Phase I:** GI discs ( $n = 12$ ) (Fuji II LC); control group ( $n = 3$ ), experimental groups with Ag<sub>3</sub>PO<sub>4</sub> at 5%, 10% and 20% ( $p/g = 3$ ). By means of a modification of the Kirby-Bauer agar diffusion method, Müeller Hinton agar plates were prepared, *S. mutans* was grown and incubated for 24 h at 37 ° C, and 4 measurements were taken.
- **Phase II:** GI discs ( $n = 20$ ); control group ( $n = 5$ ), experimental groups at 5%, 10% and 20% ( $p/g = 5$ ), daily measurements of fluoride release were made with the potentiometer for 55 days.
- **Phase III:** GI discs, 4 discs were taken, one per group at random to determine the volume of the porosity defect by computed micro-tomography.

The mean and SD of the zone of inhibition and fluoride release, differences between groups, multiple range test and Kruskal Wallis test were determined.

**Results:** Control group and 5% group: no zone of inhibition; 10% group:  $1.25 \pm 0.58$  and 20% group:  $3.16 \pm 0.38$  mm.

Kruskal Wallis test indicated statistically significant differences between groups, multiple range test showed greater difference between concentrations of 5 and 20%.

During the final measurement of fluoride release, it was observed that G4 (20%) had 1.59 ppm, followed by the control group with 1.48 ppm, G3 (15%) with 1.34 ppm and G2 (10%) with 1.28 ppm. The largest size of the porosity defect in the sample arose in the control group and the lowest in the 20% group.

**Conclusions:** The incorporation of nanoparticles to the GI at concentrations of 10% and 20% inhibits *S. mutans* without modifying its fluoride release property. In addition the volume of porosity did not increase to 20%, which proved to be promising for enhancing the properties of GI.

#### 60. EFFECTIVENESS OF TRICALCIUM SILICATE CEMENTS AND GLASS IONOMER AS INDIRECT PULP CAPPING FOR IMMATURE PERMANENT MOLARS

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**Introduction and objectives:** Indirect pulp capping (IPC) is treatment for deep acute carious lesions, with reversible pulp symptoms and no visible pulp exposure, usually in young patients. Various materials have been proposed as an alternative to replace the dentin tissue affected. One is glass ionomer cement and, more recently, tricalcium silicate-based cement. These cements have demonstrated their clinical effectiveness as IPC materials in teeth with reversible pulpitis in adult patients. However, no studies have been performed on immature teeth, so the aim of this study was to compare the effectiveness of tricalcium silicate cement and glass ionomer cement as materials for indirect pulp capping of immature permanent molars.

**Methods:** We selected 17 vital immature first permanent molars with deep carious lesions that had a diagnosis of reversible pulpitis. Prior to the treatment, digital periapical radiographs were taken. Indirect pulp capping was performed using two groups, according to the material used: Group I was made up of 11 molars treated with tricalcium silicate (Biodentine™) and Group II was made up of 6 molars treated with glass ionomer (Fuji IX™). One month after capping, the final restoration was made with resin. The presence of pain and sensitivity to

percussion was evaluated and follow-up digital radiographs were taken at one month and twelve months.

**Results:** At the beginning of the study, 4 cases (36.4%) from group I and 2 cases (33.3%) from group II had symptoms of pain although there were no statistically significant differences ( $p = 0.90$ ). In the percussion test, 3 cases (27.3%) of group I and 2 (33.3%) in group II had sensitivity but there was no statistically significant relationship ( $p = 0.79$ ). At one month, 2 molars (18.2%) of group I and none (0.0%) of group II had pain from cold, but this was not statistically significant ( $p = 0.26$ ). At twelve months, no molar in either group (I and II) had pain or sensitivity to percussion. The apical closure of the molars was unchanged at 12 months, and no periapical lesions were found in any of the molars.

**Conclusions:** Tricalcium silicate cement (Biodentine™) and glass ionomer cement (Fuji IX™) were shown to be effective at twelve months and can be a therapeutic alternative as indirect pulp capping for immature permanent first molars.

## 62. DENTAL ANXIETY IN A GROUP OF CHILDREN AGED 4 TO 12 YEARS AND THEIR PARENTS

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**Introduction and objectives:** Dental anxiety influences oral health, and hampers the treatment of pediatric dentistry patients. The objectives of the present study were: a) to identify and quantify dental anxiety in pediatric patients and their parents before visits; b) look for a correlation between both; and c) analyze the incidence of age, sex and country variables.

**Methods:** 60 children aged 4 to 12 years and their parents participated in the study. They attended the pediatric dentistry department of the Dental Hospital of the University of Barcelona, in September-October of the year 2018. The psychometric measurements of anxiety were made through: Venham Scale (VPT), Corah's Dental Anxiety Scale (DAS) and Cuthbert's Child Fear Subscale (CFSS-DS). The data were analyzed using the SPSS 18.0 statistical program and with level of significance of  $p \leq 0.05$ . A descriptive analysis of the results was carried out and the Pearson and Spearman correlation tests were applied.

**Results:** In relation to the anxiety levels measured in children, the following data showed significant relevance: 33.3% of the population did not show anxiety, 46.7% showed a low level of anxiety, 15% medium level and only 5% high level. The age group that showed a significantly higher degree of anxiety was that of children aged six to nine years with 53.5%. Children from Spain had higher values in the mild and moderate levels of anxiety, while those who came from other countries had higher values with regard to high and severe anxiety levels, and the difference was significant. When comparing both sexes, significant differences were observed in

the level of anxiety, with higher levels of anxiety in the male sex. With respect to parents, these were mostly female. At the mild and moderate anxiety levels, mothers had less anxiety than fathers, but not at the high and severe levels, where these were balanced. Correlation was observed between the anxiety of the child and that of the parents.

**Conclusions:**

1. The prevalence of anxiety (low, medium or high) prior to dental visits and treatment was 66.6% of the total number of children.
2. There is a statistically significant correlation between the child's anxiety and that of both parents.
3. Results were observed with significant correlation for the variables of sex, age and country of origin.

## 71. THE INFLUENCE OF SALIVARY pH AND DIET ON CARIES IN CHILD PATIENTS

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**Introduction:** Caries is a multifactorial disease in which the interaction of factors such as host resistance, these relationships, saliva characteristics and substrate are necessary. The scientific literature suggests that one of the factors to take into consideration is saliva, as the components not only favor the prevention of caries but they can also be used as diagnostic tools. In addition, a sugar-rich diet favors pH acidification, which produces an imbalance in the oral cavity increasing demineralization of the hard tissue of the tooth and reducing the buffering capacity of the saliva.

**Objectives:**

- Evaluate the relationship between diet and caries.
- Describe the salivary pH of the patient with a high caries index.
- Describe the salivary pH of the control patient.
- Describe the salivary pH before the intake of a sugary food.
- Determine pH changes using xylitol.

**Method:** A study was carried out with patients in the Master's course of Pediatric Dentistry at the Alfonso X El Sabio University taking samples of salivary pH in children with a high caries index and control patients, evaluating the differences between them.

The differences in pH were also evaluated after the intake of a sugary food and chewing gum with xylitol in these patients. Finally, whether diet was an influential factor in the caries index was assessed.

**Results:** It was possible to observe decisive changes in salivary pH in the different patients with high caries rates and before the intake of sugary foods.

**Conclusions:** It is necessary to inform parents of the importance of following a healthy diet in order for children

to have a good oral health. It is also important to emphasize the differences that exist between different salivary pH in the different patients that can be modified in relation to the diet they follow.

## 72. MAINTAINING THE SPACE IN THE JAW. DOES THE TRANSPALATAL BAR PREVENT A LOSS OF SPACE?

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*Introduction and objectives:* Space maintainers are devices that have the function of maintaining the length of the dental arch. They can be classified as fixed or removable, and uni- or bilateral. Traditionally, the transpalatal bar is described as a bilateral fixed maintainer that prevents mesial molar rotation in the upper arch, and therefore, a loss of space, although its use is controversial. The aim of the present study was to evaluate the space maintainers used in the maxilla and to analyze the efficacy of the transpalatal bar as a space maintainer.

*Methods:* The clinical records of patients treated between 2007 and 2013 on the Master's course of Pediatric Dentistry of the UCM were evaluated, and those that required space maintenance in the upper arch were selected. Variables regarding the design and management of the space maintainer used were recorded. The measurements were taken of those who had been fitted with the transpalatal bar and had radiographic records. These were of the initial and final edentulous zone and showed the need for space maintenance. Statistical analysis of the data obtained was carried out (significance level 95%).

*Results:* 559 clinical histories were analyzed, and in 22% of the cases it was found that a space maintainer had been placed in the upper arch. The devices used were Nance button (22%), transpalatal bar (22%), Ansa band/crown (35.8%) and removable plate (20.3%). The most frequent maintainer in unilateral primary second molar losses was the transpalatal bar, while in unilateral losses of first molars it was the Ansa band/crown. In losses of more than two molars, the maintainers of choice were the Nance button and the removable plate ( $p < 0.001$ ). No significant differences were found in the choice of maintainer in the non-symmetrical bilateral losses of two molars, or of two adjacent molars. When the transpalatal bar was placed, it was observed that the average space lost was 1.34 mm, and there were no significant differences with respect to the number or distribution of the teeth lost ( $p 0.065$ ).

*Conclusions:* The space maintainers placed most frequently in the UCM Pediatric Dentistry Master's degree course, for multiple losses (> 2 teeth) were the Nance button and the removable plate, while for unilateral losses the transpalatal bar and the Ansa band/crown were the most fitted. There is reduced drifting space if the transpalatal bar is used as a space maintainer.

## 78. THE GROPER-TYPE PEDIATRIC PROSTHESIS WITH THE PRESENTATION OF 5 CASE REPORTS

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*Introduction:* Many reasons can trigger the absence of a tooth, multiple teeth or all the teeth in the arch of a pediatric patient. Premature tooth loss negatively affects the normal development of the basic functions of the dentition. Therefore, it is considered essential to replace the any teeth lost using different types of prostheses during the primary dentition in order to restore the functions of chewing, swallowing, speech, and avoid the appearance of incorrect habits, improve esthetic appearance, prevent possible psychological repercussions associated with tooth loss, and maintain the space for the successor teeth. The Groper apparatus helps control eruption because it maintains the esthetic space in the anterior area. The aim of this work was to examine the consequences of premature tooth loss and review the benefits and complications of using the Groper appliance in children, through the presentation of five clinical cases.

*Case reports:* Five clinical cases are presented of children aged between 4 and 6 years with premature loss of anterior teeth associated with early childhood caries, treated under general anesthesia at a university center. A Groper-type prosthetic device was designed as a restorative and functional method, and it was monitored periodically at 15 days, 1 month, 3 months and 6 months after its placement.

*Conclusions/comments:* The Groper device is indicated in young patients because it allows esthetic recovery and it does not interfere in the growth, development and function of the stomatognathic system. Regarding the limitations of the Groper device, for the success of the prosthesis factors such as parents' commitment to adequate oral hygiene, follow-up control appointments, changes in diet, correct selection of the band by the operator, and the design of the Groper device should be highlighted.

## 81. AWARENESS OF PEDIATRIC DENTISTRY BEHAVIOR TECHNIQUES AMONG FIRST YEAR DENTISTRY STUDENTS

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*Introduction:* Awareness of behavioral techniques plays an important role in the way in which dental treatment is carried out. Achieving a positive attitude in a child makes successful pediatric dentistry treatment easier.

*Objective:* The aim of this research was to discover the level of knowledge on pediatric dentistry behavior techniques among first-year dentistry students of the University of Barcelona.

*Method:* A descriptive observational study was conducted, through surveys, on behavior techniques among 102 first-year students.

*Results:* The best known techniques among the respondents were the technique of positive reinforcement by 77% and oral sedation by 80%. The technique of confusion and rectal sedation were the least known by respondents scoring 1% and 6% respectively. Some 35% of respondents had a very low level of knowledge, 53% low, 13% medium and 1% high.

*Conclusions:* The level of knowledge among first year dental students on pediatric dentistry behavior techniques is globally low-very low.

#### **100. EFFECT OF AUDIOVISUAL DISTRACTION BY MEANS OF ICNOS (INTRAOPERATIVE COMMUNICATION NON OBSTRUCTIVE SYSTEM) FOR RESTORATION TREATMENT IN CHILD PATIENTS: PILOT STUDY**

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*Introduction and objectives:* Managing child behavior in children when they undergo dental treatment is one of the main challenges facing pediatric dentists. Non-pharmacological methods for the control of anxiety have been described in the literature, including audiovisual methods. The aim of this study was to evaluate the effectiveness of the ICNOS audiovisual system in the management of dental anxiety in children receiving dental treatment.

*Methods:* A pilot study was conducted on a total of 20 children with an age range of 6-9 years who had to undergo restorative treatment but no pulp therapy. They were randomly distributed in two groups, a control group (n = 10) where the treatment was performed without glasses, and the study group (n = 10) that employed the ICNOS system from the first visit. To assess anxiety and stress in the child, the FIS scale (Facial Image Scale) and the FLACC scale (Face, Leg, Activity, Cry, Consolability) were used, in addition to heart rate and saturation level prior to treatment, on the first visit and after finishing the treatment on subsequent visits.

*Results:* An average decrease in anxiety values was observed among children who used the glasses versus the control group. In addition, the heart rate of children treated with ICNOS showed significantly lower values after the first visit compared to the control group.

*Conclusions:* The use of audiovisual distraction systems (ICNOS) during restoration treatment in children aged 6-9 years permitted a reduction in the levels of anxiety and heart rate.

#### **102. KNOWLEDGE OF PARENTS/CARE GIVERS ON PREVENTATIVE PRACTICES AND ORAL HYGIENE IN CHILDREN, AND DAY TO DAY APPLICATION**

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*Introduction:* Oral health is one of the most important elements of general health and quality of life. Given that caries is potentially controllable, it is remarkable that our daily practice is almost completely related to this. Between 60-90% of school age children experience one or more carious lesions in the primary dentition, however, there is not enough knowledge on oral health, which in most cases results in poor conduct with regard to hygiene and oral care. The main preventive practices are diet control, fluoride application, chemical-mechanical control of bacterial plaque and the application of pit and fissure sealants. Given this, and in the knowledge that prevention is the primary means by which tooth decay can be prevented, analyzing the awareness of parents regarding preventive practices is necessary in order to assess the expected prevalence of caries in children. Their parents will be in charge of guiding and educating them in relation to prevention and oral care, in order to avoid as far as possible the appearance of this disease.

*Material and methods:* The study was conducted on a sample of 150 parents and/or caregivers of children aged between 3 and 10 years. The information was collected through a questionnaire divided into two parts, the first focused on the analysis of the degree of knowledge and the second was aimed at analyzing the habits applied in daily life.

*Results:* Only 36% of the parents were able to "pass" the first test and 52% the second. The best score obtained in total, only reached 7.27 /10, which clearly reflected a high degree of ignorance and bad habits in general. Only 1 in 10 parents and/or caregivers knew the proper fluoride concentration in infant toothpaste and only 8% of parents supervised brushing.

*Conclusions:* Despite the importance of prevention in correct oral health, it is evident that the bases for establishing this in early childhood are insufficient. Therefore, since it is the parents and/or caregivers who are mainly in charge, an improvement in their own oral education would reflect in better oral health in the children in their care.

#### **103. CLINICAL AND RADIOGRAPHIC EVALUATION OF PULPOTOMIES IN THE PRIMARY DENTITION USING TRICALCIUM SILICATE AFTER MONITORING OVER 6 MONTHS: RANDOMIZED CLINICAL STUDY**

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*Introduction and objectives:* The pulpotomy procedure is indicated when caries removal causes exposure of the pulp in a primary tooth with healthy pulp or reversible pulpitis. The main objective of this procedure is to remove the affected tissue from the coronal pulp while preserving the root pulp, thus protecting its integrity until it is shed. A wide range of materials and techniques have been used over the years in primary molar pulpotomies. Although Formocresol has long been considered the “gold standard”, the controversies surrounding this material have led dentists to use alternative techniques or to work with agents that allow the regeneration of the dentin-pulp complex such as MTA or, more recently, Biodentine™. The aim of this study was to evaluate pulpotomies in primary teeth clinically and radiographically using MTA HP Repair, MTA ProRoot and Biodentine™ after 6 months of monitoring.

*Methods:* This prospective randomized clinical study was conducted in patients who needed vital pulp treatment in the Pediatric Dentistry Department of the University Clinic. A sample of 18 patients was analyzed and three different methods were used to perform hemostasis: 2.5% sodium hypochlorite, saline and quaternary ammonium, in addition to three pulp agents such as Biodentine™, MTA HP Repair and MTA ProRoot. Subsequently, zinc oxide eugenol was placed to seal the cavity and the molars were restored with metal or zirconium crowns. The treatments were evaluated at 6 months.

*Results:* No clinical and radiographic differences in success were found regarding the different agents for hemostasis control. A clinical and radiographic success of 100% was obtained in both groups after 6 months of control.

*Conclusions:* Regarding the hemostatic agents, no differences in success were observed between the three groups. Both Biodentine™ and MTA ProRoot and MTA HP Repair, led to 100% clinical and radiographic success at 6 months of evaluation.

## 108. ACCEPTANCE AND PREFERENCE OF DISTRACTION METHODS IN PEDIATRIC PATIENTS AND THEIR PARENTS IN PEDIATRIC DENTISTRY

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*Introduction and objectives:* During a dental visit children are exposed to a new environment and new experiences, which can cause fear and/or anxiety. Within the behavior management techniques, distraction is one of the most accepted by children and parents, and there is a wide variety of methods such as auditory, audiovisual, audiovisual with motor component and virtual reality. Given that from reviewing the literature there are no studies that mention the preference by children and parents regarding the different types of methods

of distraction, the objective of this study was to determine which method of distraction has greater acceptance by parents and children.

*Methods:* This was a retrospective descriptive study to assess the preference of the various methods of distraction by children and parents. We included children between the ages of 5 and 9, who attended the University Clinic and who had undergone some conservative dental treatment previously. The study consists of a survey with 14 questions that covers the preference for using or not a certain method of distraction by parents and children, the preference of children and parents regarding the different types of auditory distraction methods (music and stories), active audiovisuals (Nintendo® and Play Station®) and passive audiovisuals (movies, cartoons), the differences between the sexes and ages of the children, and the preference to be able to choose the method of distraction during visits to the dentist by both parents and children.

*Results:* The sample consisted of 92 children, of whom 54.3% were boys and 45.7% girls. The average age was 7.10 years. Parents showed a greater preference for auditory distraction methods, especially stories/stories and audio-visual methods such as cartoons, while children had a greater preference for distraction methods with a motor component, especially Nintendo®.

*Conclusions:*

1. Distraction methods are widely accepted by parents and children in pediatric dentistry.
2. Parents believe that methods of distraction help improve the behavior of their children during dental visits.
3. Parents have a greater preference for passive methods of distraction, while children prefer active methods of distraction.
4. Although distraction is a very effective method accepted by patients, many state that they have not used it in previous dental treatments.

## 110. CHARACTERIZATION OF THE CHEMICAL STRUCTURE OF TEETH WITH MIH AND AMELOGENESIS IMPERFECTA. THE IMPORTANCE OF PREVENTION STRATEGIES

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*Introduction and objectives:* Molar-incisor hypomineralization (MIH) is an anomalous enamel condition that is increasing prevalent around the world. The hypersensitivity, loss of structure and anxiety associated with these treatments means that managing these patients during the consultation is complicated. On the other hand, amelogenesis imperfecta is a hereditary disorder that affects the structure and appearance of dental enamel. Like the previous defect, it is associated with sensitivity and a difficulty performing successful restorative

treatment. Clinically, it is difficult to estimate the degree of hypomineralization and the risk of tooth enamel loss in these types of teeth. That is why early diagnosis is essential in order to better understand the structure of these defects and to apply more useful prevention strategies that include the use of remineralizing agents that return, as far as possible, the affected tooth structure to normal.

**Methods:** We used a sample made up of a healthy tooth, a tooth with hypocalcified amelogenesis imperfecta and two teeth with molar-incisor hypomineralization (MIH). They all underwent between 9-15 sequence analysis by Raman spectroscopy. The chemical composition of the samples and the enamel crystallinity were determined by calculating the mineral /organic ratio and the full width and half maximum (FWHM).

**Results:** ANOVA analysis of variance was applied. Regarding the phosphate/carbon ratio ( $960/1070\text{ cm}^{-1}$ ) and the FWHM, significant differences were observed ( $p < 0.05$ ) between the healthy tooth and the teeth with MIH and amelogenesis.

**Conclusions:** The inorganic content of teeth with MIH and amelogenesis imperfecta is lower than that of healthy teeth. It is necessary to review the existing varnishes and preventive materials in order to be more specific about the tooth structure of these teeth.

#### 111. RELATIONSHIP BETWEEN THE FREQUENCY A MOUTHGUARD IS USED AND THE GROWTH OF THE JAWS AND DENTAL ERUPTION IN CHILDREN AND ADOLESCENTS PRACTICING WATER POLO

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**Introduction and objectives:** When practicing sport there is a risk of suffering orofacial injuries. These injuries can be suffered by both adults who compete in high-level categories as well children and adolescents in training categories. Despite the existence of this risk, few athletes use a mouthguard to prevent or lessen orofacial injuries. These occur during the growth and dental replacement stage of children. The effects that the use of a protector can have on growth and/or dental eruption are not known, nor are the effects that the growth and eruption can have on the adjustment of the protector. The main aim of this observational study with a prospective cohort is of discovering the relationship between the frequency of mouthguard use and growth speed of the maxilla in children and adolescents practicing water polo.

**Methods:** The sample was made up of 35 children and adolescents, 10 girls and 25 boys, aged 6 to 18, with a federation card of Catalan clubs. Those receiving orthodontic treatment were excluded, together with tooth decay, periodontal disease, temporomandibular joint pain, and those with severe mental disabilities. The participants went together with their father/mother/tutor to the Campus of Bellvitge for 4 sessions. During the first visit, impressions were taken, the mouthguards were made with 4 mm thermoplastic sheets and handed over in another visit. Monitoring will be carried out at 3 months and finally at 6 months to evaluate the oral adjustment of the mouthguard, and new impressions will be made to obtain growth measurements. Each participant will fill in a sheet with the hours the protector is used, as well as a monthly questionnaire on the degree of satisfaction and discomfort.

**Results and conclusions:** This is an ongoing study, so results and conclusions cannot be provided for the time being. At the end of March, the results corresponding to the third month of monitoring will be available, and this data will be presented at the congress.

#### 116. EVALUATION OF A CLINICAL PROTOCOL FOR THE PREVENTION OF ORAL MUCOSITIS IN PATIENTS WITH PEDIATRIC ONCOHEMATOLOGY IN A UNIVERSITY HOSPITAL

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**Introduction:** The treatment of solid malignant tumors and leukemia with chemotherapy and/or radiotherapy is associated with short and long term side effects. Among the most important side effects is oral mucositis (OM), characterized by the presence of erythematous areas and ulcerative lesions in the oral mucosa, causing pain and dietary limitations. Children and adolescents are more likely to develop oral mucositis with incidence rates that vary between 54% and 50%. Prevention and treatment continue to be a major concern and there is no clear therapeutic consensus.

**Objective:** To evaluate the effectiveness of the clinical intervention protocol developed for the prevention of oral mucositis in Pediatric Oncohematology patients of the General University Hospital Gregorio Marañón in the Community of Madrid, during the different stages of the disease.

**Methods:** This is a pre-post quasi-experimental analytical study, in which 25 children aged 0 to 20 years were evaluated who had received at least one cycle of their chemotherapy treatment previously, and who would foreseeably develop mucositis during the cycle and in later ones. A preventive protocol was established one week before each cycle. Each patient was evaluated before and after establishing the oral



prevention protocol. The Pearson Chi-square test, Yates correction and the Mann-Whitney U statistical test were used.

**Results:** There were no statistically significant differences between the presence and absence of oral mucositis before and after the application of the intervention protocol. However, patients who had oral mucositis before the protocol experienced decreased severity after applying the preventive protocol. Statistically significant differences were observed (p-value 0.026) between neutrophil levels and the presence of oral mucositis, there being a relationship between neutropenia and the presence of mucositis, and a higher degree of severity. The frequency of oral mucositis was the highest in acute lymphoblastic leukemia (20%).

**Conclusions:** Compliance with the clinical protocol for prevention can help reduce the duration and severity of oral mucositis, thus improving the quality of life of patients. The frequency of occurrence of oral mucositis depends to a great extent on the drugs administered during the chemotherapy treatment, and a low level of neutrophils (neutropenia) is an important risk factor in the presence and degree of severity of mucositis.

#### 118. ADVANTAGES OF PROBIOTICS IN PEDIATRIC PATIENTS RECEIVING ANTIBIOTIC THERAPY

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**Introduction and objective:** Antibiotics are a type of drug known to cause disturbances in the composition of the intestinal microbiota, causing diarrhea or vomiting, which vary depending on the antibiotic and the type of population. The effect of antibiotics on intestinal microorganisms justifies the incorporation of probiotics, which modulate or re-establish the intestinal microecology during or after treatment with antibiotics. The objective was to determine the benefits of prescribing probiotics in conjunction with antibiotics and to analyze the differences with respect to age or the type of antibiotic prescribed.

**Methods:** A study was conducted on the use of antibiotics together with the administration of probiotics. The data collection was carried out over 6 months in children aged between 2-13 years, without any underlying disease and who had been prescribed with antibiotics. They were treated at the Nens Hospital in Barcelona where they were prescribed with antibiotic + probiotic, and at Bellvitge Hospital, where only antibiotics were prescribed. The probiotic used was Symbioram, from Ordesa. These were given the same day of the visit along with guidelines and a stool registration calendar according to the Bristol scale. The only antibiotic group was given just the calendar. The data was collected using a questionnaire that was completed over the telephone by the parents or legal guardians of the children, and a comparative study was performed.

**Results:** A total of 80 patients were analyzed: 40 (15 boys/25 girls) in the antibiotic + probiotic group (group A) and 40 (20 boys/20 girls) in the antibiotic group (group B). Regarding vomiting and diarrhea complications during the treatment were 12.5% in group A, while in group B these were 57.5%. With regard to the type of stools, in group A they were different from usual in 47.5% and in group B in 57.5%. In group B also, the number of daily bowel movements increased. The type of antibiotic did not significantly alter the results.

**Conclusions:** The use of probiotics significantly reduced the incidence of gastrointestinal problems during treatment with antibiotics. However, more studies are needed to determine why in a percentage of the sample the use of these was not beneficial.

#### 121. REPERCUSSION OF PARENTAL ANXIETY ON THE BEHAVIOR OF THEIR CHILDREN DURING A VISIT TO THE PEDIATRIC DENTIST

Ibáñez, C.; Requena, C.; Munne, C.; Lluch, C.; Yuste, S.; Guinot, F.

International University of Catalonia. Barcelona

**Introduction and objectives:** Dental anxiety is an emotional and/or physiological response with known and/or unknown causes that can range from unpleasant situations, fear, discomfort, anguish, even negative expectations about dental visits. The most frequent etiology of dental anxiety is past traumatic experiences and, in the case of patients who come for the first time, an attitude learnt from those around them. This study investigates the closest relatives who are the parents. Due to the importance of managing a child's anxiety and behavior in pediatric dentistry, the study evaluates whether there is a relationship between the anxiety of the parents and the behavior of children during a dental visit.

**Methods:** This descriptive observational cross-sectional study evaluates the anxiety of the parents, of the children and the behavior of the child during the visit. It was done through modified Corah's subjective scales to measure the anxiety of the parents, the Venham scale to measure the anxiety of children during the consultation, and Frankl's, for the behavior of the children during the visit. Pediatric patients, who were between 4-9 years of age, and who attended two private dental clinics in the Canary Islands, were included in the study. They were children who, in the SDQ questionnaire, obtained normal values and who required some type of conservative treatment under local anesthesia and complete isolation with a rubber dam.

**Results:** The children who participated in the study had a mean age of 7.25 years, and 37.5% were girls and 62.5% boys. We observed that there was a relationship between the anxiety of the child and the parents, but it was not related to the behavior evaluated with the Frankl scale, with most of the patients exhibiting grade 4 of the Frankl scale, which meant that they had definitely positive behavior.

**Conclusions:** In conclusion, we can say that there is a relationship between the anxiety of parents and children, but not in the behavior of the child, since the vast majority exhibited definitely positive behavior according to the Frankl scale, even with parents with different degrees of anxiety.

### 127. SALIVARY CONCENTRATION OF THE ANTIMICROBIAL PEPTIDE LL-37 IN CHILDREN WITH EARLY CHILDHOOD CARIES BEFORE AND AFTER CONVENTIONAL DENTAL TREATMENT AND THE INGESTION OF ZINC SULPHATE

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**Introduction and objectives:** Tooth decay in children is a problem with a high prevalence that affects nutrition and growth. Early childhood caries (ECC), occurs in children aged three to five years who have cavities in one or more surfaces, missing teeth (due to decay) restored or cavitated smooth surfaces, or missing upper anterior primary teeth. It has been suggested that cathelicidin (LL-37) could have a role in protecting teeth from caries. This varies widely with age, as there is a low concentration at an early age that increases with age. LL-37 displays a broad antimicrobial activity against gram-negative, gram-positive bacteria, and it is effective against *Streptococcus mutans*. Zinc has been shown to induce production of the peptide cathelicidin (LL-37) which has strong microbicidal properties. There is little information on the amount of concentration of LL-37 in young children and a possible association with ECC. The objective of this study was to identify the level of concentration of LL-37 in children aged 4 years with ECC, and this association, as well as to identify the advantages of systemic or topical zinc consumption for the stimulation of LL-37 production.

**Methods:** This was a randomized controlled clinical trial with two control groups, both treated with conventional dental treatment. The positive control group had an additional intake of 10g zinc sulfate for 40 days. A 2 ml saliva sample was taken before and after dental treatment and 10 mg of zinc sulfate for 40 days. Quantification of the peptide LL-37 was performed using the Elisa kit (HyCult Biotechnology).

**Results:** The mean salivary concentration of LL-37 in children aged 4 years with ECC was 5.47 ng/ml. The group of cases that had an intake of 10 mg. zinc sulfate increased the antimicrobial peptide LL-37 considerably compared to the control group, however there was no statistical significance. The LL-37 group with zinc intake obtained a value of 80.97 ng/ml, which was the highest value, compared to the other group (27.32 ng/ml), but there was no statistical significance.

**Conclusions:** There is a correlation between low levels of cathelicidin (LL-37) in ECC, however it could not be deter-

mined as a predictor of caries. The concentration level of LL-37 in the study was 1.29 ng/ml. It was ascertained that Zinc Sulphate increases the concentration of LL-37 in saliva (18.5 ng/ml), but it is not known if it is possible to replicate the level and keep it constant in the long term.

### 138. EFFICACY IN PULPOTOMIES OF PRIMARY MOLARS USING TRICALCIUM SILICATE OR FORMOCRESOL

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**Introduction and objectives:** In Mexico, the Secretary for Health (2017) reported a prevalence of early childhood caries of 78.3%. Pulpotomies are most commonly practiced for treating caries, and this consists in the amputation of the coronal pulp. Formocresol is considered the Gold Standard for securing the remaining pulp tissue. Its use is controversial due to its cytotoxic, carcinogenic and mutagenic potential. In 2014, Shashidhar C, Shashidhar J. concluded in their study that the risk of cancer and mutagenesis associated with the use of formocresol in pulp therapy in pediatric patients was irrelevant. It was in 2016 that Meligy OA et al. concluded tricalcium silicate possesses biocompatibility, easy manipulation and desirable mechanical properties which made it a biomaterial. They compared the degree of clinical and radiographic success between Biodentine™ and formocresol, with favorable results and no significant differences. The aim of the present study was to evaluate the clinical and radiographic efficacy of tricalcium silicate or formocresol in primary molar pulpotomies.

**Methods:** At the Clinic for the Specialty in Pediatric Dentistry, 33 primary molars of 17 patients were studied. They were diagnosed with reversible pulpitis due to deep carious lesions. They were treated using the conventional pulpotomy technique with one of the two experimental materials selected, and randomly assigned in two groups 1: tricalcium silicate and 2: formocresol. The molars of group 2 were restored with reinforced zinc oxide eugenol. Both groups were fitted with a chromium-steel crown. The data to be evaluated was: 1) absence of pain, 2) presence of a fistulous tract, 3) protective tissues in periodontium, 4) radiographic conditions and 5) relationship of signs and symptoms of preservation of pulp vitality. Clinical and radiographic monitoring was performed at the first and third month. Chi square was used for statistical analysis ( $p > 0.05$ ).

**Results:** Of the 33 samples obtained, 15 (45%) were in group 1 (tricalcium silicate) and 18 (55%) in group 2 (formocresol), and these were clinically asymptomatic, without pain, inflammation, presence of sinus tract or mobility. With regard

to a persistent periapical lesion, one case arose in group 1 and two cases in group 2. Four cases in group 1 showed widening of the periodontal ligament space and nine cases in group 2. Radiographically there was a case of internal resorption 3 months into the follow-up in group 2. The clinical evaluation did not yield significant data regarding the symptomatology and radiographic evaluation in both groups ( $p > 0.05$ ).

**Conclusions:** The use of tricalcium silicate constitutes a promising alternative in pulpotomies in the primary dentition, as it is a bioactive and biocompatible material.

#### 150. DIGITAL FLOW IN RAPID EXPANSION AS TREATMENT OF CHOICE FOR PEDIATRIC PATIENTS WITH SAHS

**Blanco, M.; Pérez-Alarcón, J.; Veloso, A.; Lluch, C.; Yuste, S.; Guinot, F.**

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**Introduction and objectives:** Maxillary compression, of multifactorial origin, is a disturbance of the transverse plane, observed mostly in children with breathing disorders. It is associated with problems that include occlusal, esthetic and functional disharmony, such as: narrow airways and changes in the posture of the tongue. By decreasing the volume of air flowing through the nasopharynx, adenoid hypertrophy, rhinitis and apnea can arise. Through nasal breathing, the continuous inflow of air induces a constant stimulation of lateral growth of the maxilla and lowering of the palatal vault, improving craniofacial development. In order to improve quality of life by increasing the airways, our objectives were: To evaluate rapid expansion of the maxilla (REM) as the treatment of choice, to compare the increase in the airways, measuring total volume, oxygen saturation, and predisposition to insomnia before and after RME. And to analyze digital flow in pediatric dentistry (digital impressions, CBCT, sintering devices).

**Methods:** Prospective non-randomized interventional study with a sample of 10 cases of children aged between 6 and 10 years in the primary/mixed dentition. Various parameters pre-disjunction/RME were evaluated with sintered Hyrax expander and two weeks after RME. Maxillary compression was measured by analyzing digital models, total airway volume by CBCT analysis. The apnea-hypopnea index (AHI) and mean oxygen saturation were calculated with a pulse oximeter and nasal cannula during sleep. Subjectively, a survey of parents was conducted using the Epworth insomnia scale. For the statistical analysis the McNemar test was used for the insomnia survey and T-Test to analyze the rest of the parameters.

**Results:** Comparing the total volume of the airway, the AHI, average oxygen saturation and the amount of pre and post-RME expansion, statistically significant results were obtained, there being an improvement in all the parameters, p values being: 0.00096, 0.00056, 0.06935 and 0.00082 respectively. With regard to insomnia, there was a decrease in the risk of suffering from it.

**Conclusions:** RME is one of the treatments of choice to solve maxillary compression, as it leads to an increase in both percentage of mean oxygen saturation as well as total volume of the airway, and an improvement in AHI at two weeks after RME. There is a decrease in fatigue and a lower risk of insomnia according to the survey conducted one month after RME.

#### 158. THE USE OF BRONCHODILATORS IN CHILDHOOD ASTHMA AND THE RELATIONSHIP WITH TOOTH DECAY

**Yau, J.; Yuste, S.; Veloso, A.; Sáez, S.; Virolés, M.; Guinot, F.**

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**Introduction and objectives:** Asthma is characterized by chronic inflammation of the respiratory tract and the symptoms include wheezing, shortness of breath, tightness in the chest and coughing that vary over time and in intensity, in addition to variable air flow limitations on exhaling. Pharmacological treatment is fundamentally based on two treatment options: bronchodilators, where  $\beta_2$  adrenergic agonists are the most widely used, and anti-inflammatory drugs such as inhaled corticosteroids. Most medications are inhaled and contain fermentable carbohydrates to improve taste and increase tolerance in children. These are in prolonged contact with the teeth and oral mucosa. The frequent consumption of these inhalers in combination with the reduced salivary flow that these produce, has a negative oral effect, mainly reflected in an increased risk of caries. The most frequent oral repercussions of asthma treatment are: decrease in salivary flow, reduction of plaque pH, increase in gingivitis, increase in gastroesophageal reflux, which contributes to the erosion of the enamel, and an increase in oral candidiasis. The aim of this study was to associate the use of bronchodilators with tooth decay in asthmatic child patients.

**Methods:** This was a retrospective study, in which the clinical history of 10 asthmatic child patients of the university dental clinic was reviewed. Their ages ranged from 4 to 11 years (average of  $\pm 7$ ). The following variables were analyzed: age, sex, oral habits, prevalence of caries and types of medications administered. The statistical program Statgraphics Centurion XVI version 16.0.07 was used, together with the T-Test and simple ANOVA.

**Results:** The results obtained show that there is a tendency of high caries risk with the use of bronchodilators. However, due to the low sample size, no statistically significant differences were observed between the variables analyzed, with a p-value of 0.6. The mean age was 7 years, and there was a predominance of males.

**Conclusions:** It has been found that pediatric asthmatic patients are more susceptible to dental caries, so preventive controls with early intervention such as: periodic reviews, post-inhalation oral hygiene guidelines, fluoride application and dietary advice are of great importance.

### 160. EVALUATION ON THE KNOWLEDGE OF DIETARY AND HYGIENE HABITS BEFORE AND AFTER AN EDUCATIONAL INTERVENTION IN PATIENTS IN POGGIO A CAINAO, ITALIA

Chiva, B.; Veloso, A.; Vilella, S.; Lluch, C.; Yuste, S.; Guinot, F.

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*Introduction and objectives:* Dental caries has a multifactorial origin. Among the causes is an incorrect diet based on large amounts of sugar daily and poor oral hygiene. Both the World Health Organization and the American Academy of Pediatric Dentistry recommend a diet low in sugars making up no more than 5% of daily energy, with vegetables and fruit predominating, and adequate oral hygiene with minimum brushing of twice a day with toothpastes with an amount of fluoride suitable for the age of the patient, and fluoride applications during the usual consultations. The main objective of the study was to evaluate, if following an educational intervention, there was an improvement or not in the diet and hygiene of child patients. The secondary objectives were to find out which habits improved with a greater frequency and which ones did not, in addition to finding out parental commitment. Those parents who were able to improve at least two inappropriate habits after an educational intervention were considered committed.

*Methods:* An analytical, experimental and longitudinal study was carried out in which 200 patients were selected who attended dental check-ups in a private dental clinics and who were aged between 6 and 12 years. Inclusion criteria were childhood patients with at least one carious lesion or visible caries treatment, and special needs patients were excluded. A questionnaire with 11 questions was given to the parents or legal guardians of the patients who had to answer before and after the educational intervention, during which the appropriate hygiene and dietary guidelines were explained. There were 20 days between both questionnaires.

*Results:* 67% of the respondents were included in the study, of which 50% were boys and 46.6% were girls. Of note was that prior to the educational intervention, 23.53% of respondents were familiar with the amount of fluoride in toothpaste, which increased to 71% after the intervention. 47.1% brushed their teeth for 2 minutes and after the intervention the figure was 86.67%. 88.23% had sugary snacks or carbonated drinks and this percentage descended to 35% after the educational intervention.

*Conclusions:* Educational intervention improves the dietary and hygiene habits of the patients/guardians who are committed, and they are necessary if ignorance on proper habits is to be avoided, and for awareness on the importance of prevention.

### 162. FACTORS ASSOCIATED WITH PRIMARY MOLAR RESORPTION IN PATIENTS WITH AGENESIS OF MANDIBULAR SECONDARY PREMOLARS

Palazuelos, L.; Suárez, B.; Chun Leng, I.; Guinot, F.

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*Introduction and objectives:* The eruption of permanent teeth and the exfoliation of primary teeth are genetically programmed events. Primary teeth exist in the mouth for between 6 and 10 years. In the case of mandibular primary second molars, these appear at 26 months and the mandibular secondary premolars erupt around the age of 11 years. The primary molars exist in the mouth for approximately 9 years. However, the exfoliation and resorption of a primary tooth may be delayed in the absence of the successor tooth. The main objective of this work was to study the factors associated with the resorption of the primary second molar, in order to discover which patients had early exfoliation or conservation for a longer period of time.

*Methods:* An observational cross-sectional study was carried out. A sample of 38 patients between 7 and 16 years of age with at least one agenesis of the mandibular second premolar were selected. For measuring the study variables, panoramic radiographs, lateral tele-radiographs of the skull and intraoral photographs of the patients were used. In view of the possible factors associated with the reabsorption of the mandibular primary second molar, sex, age, facial pattern, skeletal class, molar class, occlusion, unilateral or bilateral involvement, and the condition of the mandibular second molar were studied and noted as decayed, filled or healthy. For the categorical variables, proportions were estimated at 95% with their corresponding confidence intervals (95% CI), using the Pearson chi-square test or Fisher exact test. The Student or ANOVA tests were used to analyze the relationship between quantitative and categorical variables.

*Results:* The association between age and reabsorption was also statistically significant using Anova analysis ( $p = 0.033$ ) and t-Student ( $p = 0.011$ ). For each year of age, the risk of root resorption greater than 1/4 was multiplied by 1.54 ( $p = 0.011$ ). Brachyfacial pattern was associated with lower resorption, Odds ratio (OR) = 7; CI 95% (1.19-41.36),  $p = 0.05$ . Only 33.3% of the patients with horizontal growth had advanced resorption. No significant association was found with the rest of the variables.

*Conclusions:* Age and facial pattern are factors associated with the resorption of the primary molar in patients with mandibular second premolar agenesis.

The molar or skeletal class, type of occlusion, state of the tooth, uni/bilateral involvement or sex did not have a statistically significant relationship.

## 172. FLUORIDE CONCENTRATION IN BOTTLED NATURAL MINERAL WATER: ALTERNATIVES FOR PREVENTING CARIES

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**Introduction and objective:** Since 2011 the WHO recommends an optimum concentration for fluoridation of drinking water of 0.7 ppm (mg /L). Currently, the consumption of bottled water is growing and the fluoride concentration is not adequate. The AAPD recommends fluoride supplements for children (6 months-16 years) when the water is less than 0.3 ppm. The objective was to analyze the fluoride content in bottled natural mineral water that is sold in stores in the Region of Murcia.

**Methods:** 20 types of bottled water were analyzed. All the samples were buffered with TISAB II, shaken and analyzed with ion-selective electrodes (Orion model 96-09, Orion Research, Cambridge, MA) and coupled to an ion analyzer (Orion EA-940). The electrode was previously calibrated with standards of 0.125 to 2.0 ppm, and also buffered with TISAB II.

**Results:** The mean fluoride concentration found was 0.21 ppm. The minimum value found was 0.05 and the maximum 0.67 ppm. Of the brands analyzed 75% contain less than 0.3 ppm. Only 2 types of water exceed 0.6 ppm. Most of the water did not have the fluoride content on the label.

**Conclusions:** There is a great variety of fluoride concentrations in the bottled natural mineral water marketed in the Region of Murcia. Most have a fluoride concentration lower than recommended, so an extra supply of fluoride is needed to prevent tooth decay.

## 176. PREVALENCE OF CARIES IN CHILDREN AGED 6 TO 12 YEARS WITH A RISK OF SOCIAL EXCLUSION

**Prada, I.; Miralles, L.; Armengol, A.; Marín, F.; Fernández, M.; Pérez, M.**

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**Introduction and objectives:** The etiological factors of dental caries disease defined by Keyes, were extended by Fejerskov and Manji to include socio-economic and behavioral factors. Children who are at risk of social exclusion may receive less education, have a lower income, poor access to services and poor general and oral health. The main objectives of the study were to estimate the prevalence of caries and calculate the plaque index in the study population.

**Methods:** The inclusion criteria were: children aged 6 to 12 years, from the Madre Petra de Torrent School or Nuestra

Señora de los Desamparados de Nazaret School. After an oral examination, the caries prevalence was calculated with the DMF-T index, the plaque index with the simplified Greene and Vermillion index and diet was recorded with a 24-hour reminder. The data were analyzed by means of the statistical program SPSS v23.

**Results:** A total of 160 children were examined. The caries prevalence observed was 81.87% and the community DMF-T + dmf-t was 4.481. The average plaque index observed was 1.12 (standard deviation 0.43). No differences were found between the DMF-T + dmf-t with respect to sex and age. No association was found between DMF-T and dmf-t (Chi<sup>2</sup> test;  $p > 0.05$ ). On the other hand, statistically significant differences were found between DMF-T + dmf-t and race, (Chi<sup>2</sup> test;  $p < 0.05$ ). Statistically significant differences were found in the DMF-T + dmf-t with respect to brushing. Children who brushed three times a day had a DMF-T + dmf-t 2.93 units less (CI 95% 0.55-5.32) than those who did not brush. With respect to the variables DMF-T + dmf-t, visits to the pediatric dentist and diet, no statistically significant differences were observed ( $p > 0.05$ ). No differences were observed in plaque index with respect to the DMF-T + dmf-t nor in plaque index, with respect to age, sex or race, nor in the school and brushing variables ( $p > 0.05$ ). The plaque index of those attending the dental clinic was 0.189 times lower (95% CI 0.048-0.33) than those who had never gone. In addition, the plaque index in children with sugary diets was 0.250 times lower (CI 95% 0.06-0.44) compared to those who did not consume sugars.

**Conclusions:** It was observed that children at risk of social exclusion had a very high DMF-T + dmf-t score. In addition there was no statistically significant relationship between DMF-T + dmf-t with plaque index and diet.

## 188. PREVALENCE OF POSTERIOR CROSSBITE IN A CATALAN POPULATION OF CHILDREN AGED 3 TO 5 YEARS IN RELATION WITH NUTRITIVE AND NON-NUTRITIVE SUCKING HABITS

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**Introduction and objectives:** Malocclusion is an alteration of the normal position of the teeth and jaws. It is multifactorial and may be associated with harmful habits of early childhood, such as non-nutritive sucking habits (pacifier and digital suction) and nutritious suction habits (bottle and breastfeeding), prolonged retention or premature loss of deciduous teeth, crowding, cleft palate, genetics, arch deficiencies, abnormalities in tooth anatomy or in the sequence of eruption, oral breathing during periods of growth or malfunctioning of the temporomandibular joints.

The prevalence of malocclusions in the primary dentition varies between 20 and 70%. The wide range of this preva-

lence can be attributed to a lack of uniformity in the different studies with respect to the age of the subject, the population, the sample size, the definitions and the criteria used in the qualification.

One of the most frequent malocclusions is the posterior crossbite, which may be unilateral or bilateral, with the former being more predominant. The aim of this study was to evaluate the prevalence of posterior crossbite in relation to oral habits in children aged 3 to 5 years.

*Methods:* A total of 435 children, aged 3 to 5 years, were examined in two centers. The patients were classified by age into two groups: Group A (36 to 53 months) and Group B (54 to 71 months). Patient occlusion was examined and divided according to canine and molar class, and the presence or absence of posterior crossbite. A posterior cross bite was considered any tooth or teeth from the canine to primary second molar that was crossed and they were divided into unilateral right, or left, or bilateral. Four oral habits were studied in these patients; breastfeeding, bottle feeding, pacifier and digital suction.

*Results:* There are no statistically significant differences in terms of breastfeeding time and bottle time in relation to the presence of posterior crossbite ( $p$ -value  $> 0.05$ ). However, there were statistically significant differences in those patients with posterior crossbite and the length of time a pacifier was used, that is to say, the longer the time with a pacifier the greater the crossbite ( $p$ -value 0.033).

*Conclusions:* There is a relationship regarding the length of time a pacifier is used with posterior crossbite. Health professionals should be aware of when to restrict habits.

### 189. TEACHING METHODS FOR EFFICIENT UNIVERSITY DENTISTRY TRAINING ON CHILD ABUSE

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*Introduction and justification:* Dentists and pediatric dentists play a fundamental role in the diagnosis and reporting of child abuse (CA), and they have the legal obligation of reporting any case that arouses justified suspicion. However, very few professionals do so, giving as the main reason for this a lack of adequate training during their university studies. The current university education in our environment improves the theoretical knowledge of students upon graduation and encourages the fulfillment of their role in child protection, but this does not help to strengthen confidence in their own abilities to recognize and to act when faced with this problem. Given the social responsibility of dentists in this field and of universities in their training, the aim of this study was to review the literature on the main teaching methods used to address the issue of CA in international universities.

*Methods:* A search of the literature was performed of the articles published in the scientific databases of PubMed,

Cochrane, SciElo, Medline, Dialnet and Google Scholar on the teaching methods used to approach CA in national and international Dentistry Faculties. Articles published in English and Spanish between 2007 and 2018 and the reports of government agencies and Spanish NGOs related to child protection since 2010 were included.

*Results and discussion:* In most European and North American universities, CA is a subject taught in dentistry studies. In Spain it is taught in the subject of Pediatric Dentistry, Legal and Forensic Child Practicum with a total number of teaching hours of approximately six. The contents are transmitted mainly through master classes and only exceptionally are other methods used to favor a dynamic, autonomous and experiential learning. Some universities have proposed alternative methods for a more effective university education in relation to CA, which would help to strengthen the confidence of future professionals in their ability to recognize and act in order to improve the levels of reporting and protection of children in our societies.

*Conclusions:* Methodologies are needed to enrich the master classes and to encourage students to learn in an effective and autonomous way. This requirement can be met through the use of role-playing games, problem-based learning, inverted classroom or multimedia teaching.

### 197. QUESTIONNAIRE DIRECTED AT PRIMARY CARE PEDIATRICIANS IN THE COMMUNITY OF MADRID TO EVALUATE KNOWLEDGE ON EARLY CHILDHOOD CARIES PREVENTION

**Sánchez, C.; Altglas, A.; Chico, L.; García-Navas, L.; López, C.; Lamas, M.**

*Alfonso X El Sabio University. Madrid*

*Introduction and objectives:* Early childhood caries (ECC) is a term used to describe a pattern of dental caries that affects the primary dentition of children up to the age of 71 months. Currently, this is a serious public health problem caused by an imbalance between protective factors and risk factors. At our university center more and more children under the age of 6 years present with increasingly severe symptoms of caries. The aim of this study was to determine if Primary Care pediatricians are providing updated information for preventing ECC, and if they are referring children to the dentist or pediatric dentist appropriately.

*Methods:* We drew up a questionnaire with 12 items grouped according to subject matter. Ten of the questions had a closed response and these covered the topics of diagnosis and prevention, prescription of fluoride toothpastes and finally, diet and caries risk. The last two were open-ended, and the respondent was asked whether they considered the knowledge evaluated to be adequate, and whether they would systematically refer the patient to the dentist or pediatric dentist before the first year of life. These questionnaires were distributed in several Primary Care Centers in the Community of Madrid, both in person and via email.

*Results:* Practically 100% of the respondents did not believe that a child had to start their check-ups with a dentist/pediatric dentist before the first year of life, following the recommendations of the Spanish Society of Pediatric Dentists. In addition, there is a lack of consensus on the use of fluoridated toothpastes in children under 3 years, not only on whether to use them or not, but also on the amount of fluoride they should have. There was also a discrepancy when considering prolonged breastfeeding and on demand feeding as a caries risk factor. Finally, there was a division of opinion among the respondents on whether they consider that they have updated information regarding the prevention of ECC. Some were willing to attend informative talks.

*Conclusions:* Nowadays, the high prevalence of ECC can be explained by parental ignorance on the risk factors that generate caries and how these can be counteracted. Pediatricians can play a very important role on informing them or referring the child to the dentist/pediatric dentist early on, but for this it is important to work with them by giving talks to bring them up to date on the new protocols for caries prevention.

## 202. RELATIONSHIP BETWEEN BIRTH AND PREGNANCY WITH THE APPEARANCE OF MOLAR INCISOR HYPOMINERALIZATION

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*Introduction and objectives:* The prevalence of molar incisor hypomineralization (MIH) has increased over recent years, and it varies between 3 and 40% depending on the population. It affects both sexes equally. These lesions affect the first molars and permanent incisors that erupt around the age of 6 years, but their formation and the embryological process develop around birth and during the first year of life. The etiology of this pathology is still unknown, but it is likely to be multifactorial. The prevalence is higher among children whose mothers had complications during pregnancy and childbirth. Currently, both pregnancy and delivery have become widely medicated and protocolized processes. The aim of this study was to determine whether or not there is a relationship between MIH and diseases during pregnancy and/or medications administered at birth to both baby and mother. This was a retrospective study using the medical histories of the births of children aged between 6 and 9 years together with an oral clinical evaluation for the diagnosis of MIH.

*Methods:* The sample size of this study was of 50 children who, according to the inclusion criteria, had to be aged between 6 and 9 years, and with permanent first molars erupted or partially erupted. Two calibrated examiners performed the examination of the children to ascertain the presence or

absence of MIH and the degree to which each tooth was affected. A retrospective study was carried out with the data obtained on the child's background during the first year of life and on the pregnancy and delivery. The medical data regarding the intrapartum situation was added later. The administration of drugs during childbirth and viral or bacterial diseases was assessed in order to find out if this is associated or not with the presence or absence of MIH.

*Results:* A prevalence of 45% MIH syndrome was established. Out of a total of 50 children, mothers with the highest number of drugs during delivery were 15%, and all were mothers of children with MIH. Mothers who did not remember what medication they were given at birth amounted to 45%. Of these 25% were mothers of children with MIH. Of all the MIH cases, 10% had a high rate of enamel involvement with claudication and residual caries or severely destroyed crowns. These cases corresponded with patients who had suffered measles at an early age.

*Conclusions:* The results show a relationship between MIH and diseases and perinatal medication. Analyzing medical histories on births is very important in order to offer more concrete results.

## 211. ADHESION OF RESIN-MODIFIED GLASS IONOMERS

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*Introduction and objectives:* Glass ionomers are the materials of choice for minimal intervention restorations in primary teeth. The restoration of interproximal caries lesions represents a great challenge for professionals since glass ionomers have a high failure rate. Resin-reinforced ionomers (RMGI) may have a higher retention rate than conventional ionomers. In recent years many resin-modified glass ionomers have appeared and *in vivo* and *in vitro* studies are needed to assess their adhesive properties. The objective of our study was to compare the resistance to shear forces of five RMGIs on demineralized enamel.

*Methods:* For the study, we used 100 bovine primary lower incisors randomly divided into 5 groups: Riva LC HV (SDI) + Riva Conditioner (SDI); Vitremer (3M ESPE) + Primer Vitremer (3M ESPE); Active (Pulpdent) + total etching with Prime Bond Active (Dentsplay); Fuji II LC (GC) + Dentin Conditioner (GC); Ionolux (VOCO) + Dentin Conditioner (GC). The teeth were placed in a demineralizing solution for 48 hours. The materials were applied to the buccal surfaces using a standardized polyethylene cylinder with a height of 4 mm and an internal diameter of 3 mm. The materials were placed in a single layer of 4 mm and light-cured for 20 seconds, except Vitremer which was polymerized for 40 seconds. Shear force resistance was carried out with a Universal AGS-1 KND test machine (Smihadzu, Japan). The force required to take

off the material was recorded in Newton and converted to Megapascals. To find out if there were differences between the different materials, the Kruskal-Wallis test was used and to detect the differences in pairs, the Dunn test was used.

**Results:** The five glass ionomers obtained different adhesion forces (K-W:  $p < 0.001$ ). Activa showed significantly higher resistance to shear forces than Vitremer, Riva LC HV and Ionolux ( $20.41 \pm 4.79$  MPa;  $4.63 \pm 5.07$  MPa;  $13.01 \pm 2.68$  MPa;  $9.13 \pm 4.50$  MPa; Dunn:  $p < 0.05$ ). Vitremer showed the lowest resistance to shear forces, and was significant against Activa, Riva LC HV and Fuji II LC ( $4.63 \pm 5.07$  MPa;  $20.41 \pm 4.79$  MPa;  $13.01 \pm 2.68$  MPa;  $14.84 \pm 7.99$  MPa; Dunn:  $p < 0.05$ ).

**Conclusions:** The RMGI that were bonded using the total etch technique with a universal adhesive could have a higher rate of retention due to their greater resistance to shear forces.

### 231. COMPARATIVE STUDY ON THE DIMENSIONS OF THE DENTAL ARCHES IN THE FIRST PHASE OF THE MIXED DENTITION AMONG CHILDREN BORN UNDER CONDITIONS OF PREMATUREITY AND THOSE BORN AT TERM

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**Introduction and objectives:** One of the pillars of pediatric dentistry is the study of the growth and development of the dental arches. There have been numerous studies on arch size variation, but few report dimensional changes of the dental arches in children born under conditions of prematurity. Given that the impact of prematurity has been demonstrated in certain dental parameters, such as on tooth size, occlusal relationship or the presence or absence of caries, in the present study, we posed the following question: can prematurity affect the size of the dental arches? The objectives of the present study were: a) to evaluate the different parameters of the dimensions of the arches in children born under conditions of prematurity and in children born at term, in the first phase of the mixed dentition; and b) to evaluate if there are differences between the different parameters of the dimensions of arches, in the first phase of the mixed dentition, between children born under conditions of prematurity and children born at term.

**Material and methods:** The sample consisted of 17 patients born under conditions of prematurity and 20 born at term, who participated in a multidisciplinary study carried out in the University Hospital "San Cecilio" of Granada. The parameters that were measured, using a digital caliber, were: primary intercanine width, primary intermolar width, permanent intermolar width, primary depth and primary perimeter. For the statistical analysis, Student's t test was used for independent samples and analysis of variance (ANOVA) for more than two groups of quantitative variables.

**Results:** We observed that the dimensions of the arches were smaller in children born under conditions of prematurity than in children born at term. These differences were significant in relation to the upper intercanine width, the upper and lower intermolar width and the upper and lower perimeter. Other authors have also found smaller sizes in the dimensions of the arches of children born in conditions of prematurity, but we consider more studies are needed to find all the factors that may influence this decrease.

**Conclusions:** With respect to the size of the dimensions of dental arches in the first phase mixed dentition, we observed that these were of a smaller size in the children born under conditions of prematurity when compared with those born at term.

### 237. ADVANTAGES OF THE AUSTRO REPOSITIONING APPLIANCE AS FIXED FUNCTIONAL TREATMENT OF BRACHYFACIAL PATIENTS WITH CLASS II DIVISION I MALOCCLUSIONS AND MANDIBULAR HYPOPLASIA

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**Introduction:** Class II malocclusion is very common and in most cases it is caused by mandibular hypoplasia. The treatment of choice in these cases is a functional appliance.

**Objectives:** The aim of this study was to analyze the skeletal and dentoalveolar changes that occur in brachyfacial patients with class II division 1 malocclusion with mandibular retrognathia and mandibular hypoplasia after being treated with the Austro repositioning appliance.

**Material and method:** The study was conducted in 25 brachyfacial patients with class II division 1 malocclusion who were compared with a control group of 25 brachyfacial patients with the same dentoskeletal characteristics. The study was based on patients who underwent initial cephalometric analysis, and a second cephalometric analysis a year later, on completion of their treatment with the Austro repositioning appliance and orthodontic treatment with a fixed appliance.

**Results:** Skeletal improvement was achieved in the class II division 1 malocclusion. The ANB angle decreased significantly ( $p < 0.001$ ) and the changes were located in the jaw. The SNB angle increased significantly ( $p < 0.001$ ) and mandibular growth (Co-Pg) also increased significantly ( $p < 0.001$ ). The increase in the facial axis was also significant ( $p < 0.001$ ), which improved the vertical pattern.

**Conclusions:** The Austro repositioning device is an effective fixed functional device for the skeletal treatment of class II division 1 with mandibular hypoplasia in brachyfacial patients in a short period of time. It improves overjet, overbite and mandibular growth significantly. It has different advantages over



other functional devices as it is a comfortable device, it does not hinder diction or chewing, and there are rarely any complications or emergencies. Treatment time is reduced as a fixed appliance can be used while stimulating mandibular growth.

## 245. INFORMED CONSENT IN PEDIATRIC DENTISTRY

**Ferro, M.J.**

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*Introduction:* Informed consent is based on: Rules on human experimentation, the Nuremberg code, the Universal Declaration of Human Rights, Declaration of Helsinki, embodied in Children's Rights, the Spanish Constitution, the General Law on Health, Decrees and the Spanish Code of Ethics and Dental Deontology.

*Objectives:* To define and evaluate the process of informed consent during the practice of dentistry, in the Faculty of Dentistry of the Catholic University of Valencia.

*Methods:* Analytical cross-sectional study. Methodological procedures: questionnaires and interviews for defining and assessing informed consent. VD+: type of informed consent (listening to the child, assent, subrogated+, oral, written, none) VI: socio-demographic factors, conditions of the children and their representatives, ways of influencing the decision, information provided by the operator and the time to take the decision. Population was made up of Dentistry students and a stratified random probability sample of patients with their representatives. Statistical analysis was performed with nonparametric tests: percentages and contrast tests of statistical independence hypothesis, Chi square, correlation tests, Cochran's Q test and Kendall W.

*Results:*

- We defined informed consent and found dependency between the types of consent and the socio-economic variables.
- An association between type of consent, conditions of children and representatives and ways to influence the decision, and free from persuasion.
- Significant differences in the information provided by the operator.
- The time for taking the decision was independent of the type of consent in young children.
- We found concordance in the assessments of the consent by all the parties involved in the process.

*Conclusions:*

1. The process of informed consent at the pediatric dentistry clinic of the CUV, adequately complies with these variables. However, it can be improved and we aim to create a protocol that standardizes the application criteria, the co-participating triad on health decision making, risk assessment according to treatment, and obtaining consent at the age of 7 years.
2. Most children understood the information, but very few children felt willing and able to decide due to discernment and maturity limitations.

3. The types of consent (small children/minors) were free of persuasion, which was attributed to a lack of maturity and inappropriate behavior of the child or his/her young age. There was no manipulation or coercion.
4. There was concordance in assessments of consent by the operator, representative and patients for most of the variables.

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## SYSTEMIC REVIEW OF THE LITERATURE

### 50. CARIOGENIC POTENTIAL OF PLANT-BASED DRINKS COMPARED WITH COW'S MILK

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*Introduction and justification:* The consumption of beverages of vegetable origin as substitutes for milk of animal origin is not only increasing in the adult population, but also in the pediatric population. The effect of these types of drinks has been widely studied at a nutritional level, but not regarding acidity, tooth decay or oral health in general. Therefore, the objective of this literature review was to evaluate the effect of beverages of plant origin on the oral health of pediatric patients.

*Methodology of the review:* A literature search was carried out in the PubMed database in which the most current articles that fulfilled our inclusion criteria were consulted (articles published in the last 15 years, in English or in Spanish, which discussed the topic of interest and were indexed in PubMed).

*Results and discussion:* After applying the inclusion and exclusion criteria, 10 articles considered as relevant for this literature review were selected. Clinical studies, *in vivo* and *in vitro* studies, as well as literature reviews were selected. Beverages of vegetable origin have in their composition sugars of vegetable origin and, in turn, free sugars that are added later to improve their organoleptic properties. After evaluating the content of sugar present in different brands available in the Spanish market, we can see that some of the alternatives that contain less sugar are soy or almond drinks, both without sugar, of the ALPRO® brand. Despite this, the articles showed that, of the beverages studied, the most cariogenic were those that were made from soya, since they are more acidogenic and allow a greater growth of the *Streptococcus mutans* colonies.

*Conclusions:* The vegetable drinks that have been studied the most are soy and almond. These studies confirm that they are more cariogenic than cow's milk due not only to the presence of free sugars, but also to their acidity. However, there is still a gap in the literature in relation to the least cariogenic plant-based drink since there are no studies that analyze the cariogenic potential of the other alternatives to cow's milk such as rice or quinoa drinks.

### 132. INLAYS IN PEDIATRIC DENTISTRY. WHAT LITERATURE IS THERE IN THIS REGARD?

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*Introduction and justification:* Inlays, both in resin and in ceramic, are considered a minimally invasive restorative treatment that is used routinely in the adult patient, but not very frequently in the pediatric dentistry patient. However, the current trend leads to minimally invasive dentistry in which the modern approach is to perform conservative elimination of caries with a minimal excavation. These methods are possible if adhesive restoration materials are used that do not require mechanical retentions, and in which partial coverage is carried out instead of a total restorations. The objective of this work was to discover the current evidence, *in vivo* and *in vitro*, on the use of inlays in pediatric dentistry patients, in the primary and permanent dentition.

*Methodology of the review:* A systematic review of the literature available from the last 5 years to date in the PubMed database was performed using the keywords “dental onlay”, “dental inlay”, “indirect composite”, “indirect ceramic”, “endocrown”, “primary teeth”, “children”, “adolescence” and “pediatric dentistry” with the Boolean connector AND and OR.

*Results and discussion:* Once the articles carried out on animals and on patients older than 18 years had been eliminated, the search generated a total of 105 publications, and those that were unrelated to our study were discarded. Based on this, 11 articles were included in the review. Although the current literature is scarce, the authors propose the use of onlay/endocrowns for pulpotomies of deciduous teeth, as an esthetic and conservative alternative to conventional restorations. Likewise, there are publications of cases in the literature solved by using of inlays in patients with oligodontia, *amelogenesis imperfecta*, *dentinogenesis imperfecta*, ankylosed primary teeth, for secondary molars in infraocclusion and the use of this technique for the management of patients with severe molar incisor hypomineralization (MIH).

*Conclusions:* Given that the literature is limited and heterogeneous, a larger number of studies and publications with a broad follow-up period need to be produced in order to assess the practicality of inlays in child patients.

### 140. TREATMENT OF NECROTIC YOUNG PERMANENT TEETH WITH AN OPEN APEX

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*Introduction and justification:* Young teeth with an open apex in which a pulpal necrosis occurs can be treated by

apexification or revascularization. The objective was to compare both techniques for treating these teeth.

*Methodology of the review:* A literature search was carried out in PubMed and Cochrane, using as keywords “revascularization” OR “regenerative endodontics” OR “apexification”. The inclusion criteria were: patients younger than 18 years with necrotic permanent teeth with an open apex. The studies carried out before 2009 and those in which the necrosis had been produced by a non-carious lesion were ruled out.

*Results and discussion:* Apexification consists in depositing artificial materials in the duct that act as an apical plug. MTA has been demonstrated to be the most effective, which allows the formation of a plug in a single session. This technique favors periapical tissue healing, but does not stimulate the apical closure due to the action of the patient’s cells. The tooth is very weak and suffers a high risk of fracture, this being the main cause of failure of this treatment. The success rate is approximately 80%. Revascularization is a treatment based on the activity of stem cells that have survived necrosis, capable of differentiating into odontoblasts, to form new root dentin. The time that elapses and the possibilities of achieving disinfection of the duct system condition the success of the treatment. It permits root development and depositing hard tissue along the canal, increasing the length and thickness of the root. The success rate is around 76%. The main cause of failure is apical periodontitis.

*Conclusions:*

1. Revascularization allows root development, while in apexification closure of the apex occurs artificially.
2. Revascularization increases the length of the roots and the thickness of the walls of the ducts, which is not achieved with apex formation.
3. The main cause of failure of the teeth treated by apexification is fracture, and the main failure with revascularization is apical periodontitis.
4. The success rate of apexification is slightly higher than that of revascularization, as the latter depends more on the characteristics of the tooth requiring treatment.
5. The clinical results of long-term revascularization have still to be assessed due to the recent development of studies on this treatment.

### 166. BIODENTINE® IS EVERYTHING THAT GLITTERS GOLD? A REVIEW OF THE LITERATURE

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*Introduction and justification:* In pediatric dentistry the search for biocompatible, effective and resistant materials is particularly important. Biodentine® is a calcium-silicate cement on the market since 2009 that was initially designed as a “dentin substitute”. Given an increase in the scientific

literature on this material and its increasingly common use in the dental clinic, especially in pediatric dentistry treatment, a literature review was considered appropriate in order to get in depth and updated information on Biodentine®. We also intended to collect the best scientific evidence available on its clinical use in pediatric patients.

*Methodology of the review:* an electronic search was carried out using the scientific bases PubMed and Google Scholar. The search terms used were: “biodentine and primary teeth”, “biodentine pulpotomy”, “biodentine properties” and “biodentine”. Articles published in English or Spanish between 2007 and 2018 were included. Abstracts, letters to the editor and editorials published in scientific journals were excluded.

*Results and discussion:* Biodentine® has apparent advantages over other materials, mainly its biocompatibility, bioactivity, easy handling, high viscosity, good compression strength, high density with low porosity, a shorter setting time compared with other similar cements and a lower dental discoloration capacity. However, radiographically it does not comply with the ISO standards on radiopacity. It is a material widely used in the permanent dentition in the techniques of direct and indirect pulp capping, partial pulpotomy, retro-filling and repair of furcation lesions. It has excellent results and clinical and radiographic success although protocols for its clinical use have not been found. In primary teeth, it is used for indirect pulp capping and pulpotomies. The use of Biodentine® as a drug to treat pulp stumps during a pulpotomy has shown very high levels of clinical success in the literature, similar to those of MTA. The levels of radiographic success are also initially very high, decreasing in the medium and long term until they are below those obtained by MTA.

*Conclusions:* The clinical evidence currently available on Biodentine® is limited. More randomized and controlled clinical studies are necessary, with a follow-up time of more than 18 months to be able to make conclusive statements about the advantages of this material and, above all, to start using it in a safe and generalized manner in pediatric patients.

### **167. THE IMPORTANCE OF MANAGING THE PROGNOSIS OF TRAUMATIC INJURIES IN PEDIATRIC DENTISTRY. A REVIEW OF THE LITERATURE**

**Castro, L.M.; González, F.; Ribelles, M.**

*CEU-Cardenal Herrera University. Alfara del Patriarca, Valencia*

*Introduction and justification:* Dental trauma is defined as the result of an accident that affects the hard tissues and the support of the tooth. This is now the second reason for seeking dental care after caries, and it is great oral health problem during childhood. This is why dental trauma is one of the main problems facing pediatric dentists during their daily practice, and in some cases the treatment carried out is

not appropriate. For this reason, dentists should be updated constantly on this topic in order to act appropriately in these situations.

*Methodology of the review:* An electronic search was carried out in the main databases: PubMed, Cochrane, SciELO and Google Scholar. As inclusion criteria, complete articles published between 1995 and 2019 in English and Spanish were selected. We excluded unpublished articles in this period of time and in languages other than English and Spanish. Abstracts and letters to the editor were also excluded. Some 280 articles were reviewed and finally 130 were used.

*Results and discussion:* The most frequent causes of injuries are usually falls, sporting activities and traffic accidents, existing in this way, two moments throughout life where there is a greater predisposition to this type of condition, the first years of the childhood (21.72%) and during adolescence (5.6%). There are significant differences in terms of gender, as boys are the most affected, although these differences are lessening due to the incorporation of girls into the practice of activities previously carried out mostly by boys. There are also predisposing factors that increase the risk of suffering this type of injury, increased overjet (22%) and inadequate lip seal (28.57%) the most commonly related factors. All the authors consulted agree with the importance of an early diagnosis and management of dental trauma, as well as a proper follow-up.

*Conclusions:* Therefore, it is concluded that promoting public awareness and the continuous updating and training of dentists and pediatric dentists, will significantly improve the likelihood of acting in an appropriate manner, conditioning the prognosis of the treatment and, therefore, the well-being and future of the child.

### **169. THE INFLUENCE OF DENTAL AGENESIS ON THE DEVELOPMENT OF THE DENTITION. A REVIEW OF THE LITERATURE**

**Türk, A.; Vilella, S.; Acosta, J.; Guinot, F.**

*International University of Catalonia. Barcelona*

*Introduction and justification:* Dental agenesis is considered a congenital anomaly of multifactorial origin that can occur both in the primary and secondary dentitions, causing esthetic, functional, as well as psychological problems in the children affected. The objective of this review was to present a brief review of the literature describing this clinical condition to include the terminology, etiology, prevalence, syndromes and associated dental anomalies, as well as the therapeutic options.

*Methodology of the review:* A systematic review was carried out through a search in the following databases: PubMed (National Library of Medicine, NCBI), SciELO and Google Scholar. We searched for clinical studies, systematic reviews, case and control studies, cohort and cross-sectional studies. We used 4 key words “Child European dental agene-

sis”, “Childhood dental development”, “Dental hypodontia”, “Treatment of dental agenesis” combined with the secondary ones, and found 6,428 articles related to the subject.

*Results and discussion:* 48 articles were selected once the inclusion and exclusion criteria were applied. These were subsequently classified into 4 categories: etiology, prevalence, associated dental anomalies and therapeutic applications.

*Conclusions:* Performing an early diagnosis using panoramic radiographs for the identification of this anomaly is of great importance. Detection at an early age allows proper management of these disturbances that can act as an etiological factor for a malocclusion. The treatment is complex, and there is no consensus among the authors on what line to follow, but maintaining healthy primary teeth and orthodontic closure are the most popular therapeutic options.

### 178. PARENTAL KNOWLEDGE AND ATTITUDES TO ORAL HYGIENE CARE AND DIET OF PATIENTS AGED 0 TO 6 YEARS. A REVIEW OF THE LITERATURE

**Tolomei, S.E.; Carmona, M.; Ribelles, M.**

*CEU-Cardenal Herrera University. Alfara del Patriarca, Valencia*

*Introduction and justification:* In recent years, preventive strategies aimed at controlling caries have been very effective in the general population. However, there are many preschool patients who continue to go to the dental clinic with this disease. As health professionals we are responsible for the control of oral disease in children. Therefore, we must assess the knowledge and attitudes of parents in relation to the factors most related to its development: hygiene and diet.

*Methodology of the review:* A review of the literature was made using the scientific bases PubMed and Google Scholar. The search terms were: “Knowledge” AND “Caries”; “Oral health” AND “Preschool” OR “Children”; “Diet” AND “Education” AND “Caries” AND “Parents”; “Prevention” AND “Caries” AND “Parents”. Initially, 1960 articles were obtained. After the exclusion of articles not published in English or Spanish, and not published between 2000 and 2019, 1409 articles were obtained. After the exclusion of abstracts and letters to the editor, the sample was reduced to 1162. A total of 152 articles with relevant information made up the study sample.

*Results and discussion:* The etiology of early childhood caries is multifactorial and frequently associated with inadequate diet and poor mechanical control of bacterial plaque. Currently, the literature suggests that the education of parents in oral health should be initiated as early as possible, as from pregnancy, and during the first years of life of the child, so that parents are properly informed of the main factors involved and so that prevention is the more effective. The knowledge of parents on oral health, according to the literature reviewed is scarce, and improving the education of the parents is necessary since this plays an important role in

the prevention of illnesses in their children, as they are the main transmitters of oral health habits.

*Conclusions:* Despite the latest advances in prevention, most of the population does not know in depth the relationship of etiology and development of dental caries in the pediatric population. Pediatric dentists and other health workers should be more thoroughly involved in instructing parents and legal guardians on diet and hygiene.

### 180. UPDATE ON THE ETIOLOGY OF DENTAL AGENESIS

**Manhes, G.; Paz Cortés, M.**

*Alfonso X El Sabio University. Madrid*

*Introduction and justification:* Dental agenesis is a developmental anomaly in which the absence of one or more teeth can be observed clinically and radiologically. Although the prevalence of agenesis varies according to the demographic profiles, dentition and sex, it is considered to be the most common dental anomaly. There is a higher percentage of occurrences among the Caucasian population, especially among the female sex. Agenesis can be expressed in the primary or permanent dentition or both. Excluding the third molars, the lower second premolar, the upper lateral incisor and the upper second premolar are the most affected teeth. There is no clear consensus in the literature on the exact reasons for it.

*Methodology of the review:* A literature search was made of all the scientific articles related to the topic of interest, most of them published in the last five years. The scientific databases used were: Medline, PubMed, Web Of Science, and Dentistry and Oral Science Source. The inclusion criteria were articles related to the etiology and from the last 5 years, and the articles/books that were not current were excluded. The keywords used were: tooth agenesis, hypodontia, mutations, and syndrome.

*Results and discussion:* Dental agenesis occurs due to a failure during the formation of the tooth germ as a result of a complex combination of genetic, environmental factors and evolutionary factors. More than 200 genes are involved in the process of odontogenesis and the mutations of some of them cause dental absences. The fact that these genes are also involved in the development of other organs means that dental agenesis is associated with syndromes, such as Down syndrome, hypohidrotic ectodermal dysplasia and facial clefts (Van der Woude syndrome and Pierre Robin syndrome). The causes of dental agenesis include maternal health during pregnancy, as well as environmental factors during early childhood. The different phylogenetic theories suggest that the reduction in the number of teeth is related to functional adaptation due to a masticatory hypofunction.

*Conclusions:*

1. The literature reports that the genes involved in isolated dental agenesis and/or associated syndromes are: MSX1, PAX9, AXIN2 and AED.

2. The environmental factors that can most influence are: vitamin deficit, smoking, the intake of medicine or diseases such as rubella, scarlet fever or syphilis, and in the early years of the patient, radiotherapy or chemotherapy.

#### **184. UPDATE ON THE THERAPEUTIC APPROACH TO MOLAR-INCISOR HYPOMINERALIZATION**

**Clemente, B.; Gavara, M.J.; Ribelles, M.**

*CEU-Cardenal Herrera University. Alfara del Patriarca, Valencia*

*Introduction and justification:* Molar incisor hypomineralization (MIH) is a qualitative disorder of the enamel of systemic origin and of unknown etiology. It is a syndrome that has repercussions at a functional, aesthetic and therapeutic level, creating a problem for the clinician and patient. Among the associated clinical problems are dental sensitivity, caries lesions, fractures and difficulty in achieving good anesthesia, which can generate fear in the child patient. For all these reasons, a literature review on the therapeutic approach that can be carried out today on this clinical entity was considered convenient.

*Methodology of the review:* A search of the electronic literature was carried out in different databases: PubMed, Cochrane, Medline and Google Scholar. The research was limited to studies published in English and Spanish. Articles from 2001 were included, which is when the concept of MIH was established, and until 2019. The keywords used were: molar-incisor hypomineralization, MIH treatment, MIH and remineralization, MIH and prevention, MIH and anesthesia.

*Results and discussion:* The therapeutic decision about this entity is taken according to the severity of the tooth to be treated, the age of the patient, the child's capacity for cooperation and the socioeconomic level. The treatment of MIH should have vision, and it should be preventive, restorative and in some cases the extraction of the tooth should be considered. Within the preventive treatment, it is important to follow a proper diet, use fluoride toothpastes, place pit and fissure sealants, apply desensitizing and remineralizing products and even use resin infiltration. In the restoration treatment of the molars, we will carry out restorations with composite resins and with glass ionomer for mild or moderate lesions. On the other hand, for severe lesions, the treatment of choice will be to place preformed stainless steel crowns and inlays. In the restorative phase of the incisors, treatments such as microabrasion and tooth whitening will be carried out, along with resin and veneer restorations. In the more severe cases extraction will be considered.

*Conclusions:* Although there are different treatment approaches for MIH that have achieved acceptable clinical solutions, no innovative therapeutic option has been found in recent years, so the protocol of action remains the same. Early identification and appropriate care of MIH can minimize later interventions and prevent possible negative sequelae.

#### **187. CHANGES IN LEARNING AND THE USE OF BEHAVIOR GUIDANCE TECHNIQUES IN PEDIATRIC DENTISTRY AS A RESULT OF THE APPEARANCE OF THE MODERN FAMILY**

**Alvarado, J.A.; Segarra, C.; Ribelles, M.**

*CEU-Cardenal Herrera University. Alfara del Patriarca, Valencia*

*Introduction and justification:* As a consequence of the social changes that have occurred in recent decades, and especially the appearance of new modern families, the relationships between parents and children are less authoritarian and more permissive. As a result learning and the use of behavior guidance techniques (BGT) in pediatric dentistry, both basic and advanced, have been modified since some of these are considered inappropriate by parents. For this reason, training programs in pediatric dentistry have had to adapt to these changes in society in which parents are skeptical of the traditional management of child behavior.

*Methodology of the review:* To carry out this review of the literature, a search of the literature was made in electronic scientific databases such as Medline, PubMed, Cochrane, SciElo and Google Scholar. The following keywords were used: behavior management techniques, contemporary parents, pediatric dentistry. Scientific articles (reviews, clinical studies) written in English and Spanish, and published in the last 35 years, were used.

*Results and discussion:* For this literature review 180 articles were found, of which 67 articles met the established inclusion criteria. The social changes that have occurred in recent decades are influencing acceptance by parents regarding the use of BGT in pediatric dentistry. For this reason, the pediatric dentist receives during training different strategies on how to apply BGT in the pediatric patient. Thus, in the current undergraduate and postgraduate programs, aversive techniques are taught with less emphasis, and pharmacological and communicative techniques are taught as acceptable, with the exception of the hand over mouth technique, which is considered unacceptable nowadays. The amount of time spent learning BGT has not changed significantly in recent years.

*Conclusions:* Parents in modern families reject any technique that could be considered as abusive or leading to aversion. Currently, communication techniques are the BGT of choice when training students in the different educational programs of both undergraduate and graduate degrees in Pediatric Dentistry.

#### **191. TREATMENT FOR MOLAR-INCISOR HYPOMINERALIZATION**

**Madariaga, I.; Martínez, T.; Munne, C.; Guinot, F.**

*International University of Catalonia. Barcelona*

*Introduction and justification:* Molar incisor hypomineralization (MIH) is a disease of systemic origin that affects the

enamel of the first permanent molars and often the incisors. It is characterized by a disturbance in the enamel mineralization, and it has an inconsistent defect in number, location and severity in the patient and between patients. Clinically demarcated opacities of white, yellow, cream and/or brown are observed. The restorative management of teeth with MIH represents a challenge in clinical practice. Taking into account that the prevalence of MIH is increasing, this phenomenon can be considered a relevant oral health problem due to the repercussions that it entails. Therefore, carrying out this review was considered appropriate, to determine the multidisciplinary approach and early treatment for these children in order to obtain better functional and aesthetic results in the long term. The objective was to systematically evaluate and contrast the different treatments disseminated and indicated in the scientific literature for teeth affected by MIH.

*Methodology of the review:* A literature search was performed using the PubMed and Google Scholar database with the keywords Treatment in MIH, extractions in MIH. Articles published in English as of 2010 were included in the study, systematic reviews, protocols and clinical cases were taken into account. The exclusion criteria were articles published in other languages and prior to 2010.

*Results and discussion:* 4978 articles referring to MIH were found, of which 77 met the criteria for the present study. Remineralizing, sealing of pits and fissures as well as the use of glass ionomer had good results. For cases of severe MIH, composite materials should be considered, either direct or indirect, as well as complete crown protection. The extraction of the first permanent molars with questionable long-term prognosis should be considered. An early diagnosis is necessary to be able to carry out an early action plan and to involve parents and secure their commitment.

*Conclusions:* There is no single treatment for teeth with MIH. Each case must be evaluated individually, and at the same time, the benefits of each of the materials must be assessed.

## 195. CEMENTING TECHNIQUES FOR PEDIATRIC ZIRCONIUM CROWNS. A REVIEW OF THE LITERATURE

**Calvillo, A.; Viroles, M.; Torrents, R.; Guinot, F.**  
*International University of Catalonia. Barcelona*

*Introduction and justification:* In 1950, Humphrey introduced stainless steel crowns for the restoration of primary molars with extensive caries. Since then, they are considered the gold standard for restoration. However, numerous studies speak of poor esthetic satisfaction by parents and children. Stabilized zirconium crowns offer a high esthetic outcome, but require a completely passive fit. That is, they cannot be contoured and their retention must be achieved by cementation. The procedure is complicated because of a need for good isolation and hemorrhage control, added to a short working

time with the cement, and the poor cooperation of pediatric patients. Because of the lack of information on the cementation of these crowns, our main objective was to determine which is the most effective cementation technique for pediatric zirconium crowns.

*Methodology of the review:* A literature search was carried out in the PubMed database (National Library of Medicine, NCBI) and in the Cochrane Library Plus, where the most current articles that met our inclusion criteria were consulted (articles published between 2013 and 2018, in English, scientific studies published in indexed journals in JCR (Journal Citations Report) and studies with high scientific evidence). Clinical studies, *in vivo* and *in vitro* studies, as well as literature reviews were selected.

*Results and discussion:* After applying the inclusion and exclusion criteria, the final sample obtained was 11 articles. The zirconium crowns obtain good results in relation to the satisfaction of parents. However, retention is more complicated. This can be compromised by the cement contacting blood or saliva, and more than half of the studies do not describe what protocol they use to avoid contamination. In turn, no study takes into account the material remaining in the tooth before cementing.

*Conclusions:* The literature on the cementation of zirconium crowns is very scarce. A larger number of publications detailing cementing techniques and types of cements is necessary to determine a good cementing protocol, and thus achieve a higher success rate.

## 198. ANTIBIOTIC RESISTANCE. WHAT ARE WE DOING WRONG?

**De Andrade, E.; Álvarez, N.; Beltri, P.; Planells, P.**  
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*Introduction:* Given the growing problem of microbial resistance as dentists, it is our duty to make a rational and adequate use of antibiotics, and to make the patient aware of self-medication in order to avoid indiscriminate drug use. For this it is necessary for us to be updated on the new strategies that are proposed. Over recent years, several strategic plans have been established worldwide. Some of them have proved to be effective, but every day there are more deaths and infections because of multi-resistant microorganisms. With regard to the field of dentistry, the action taken has not been specific or concrete enough to address this growing problem.

*Justification/objectives:*

- To study the current situation of antibiotic resistance.
- To describe the strategies currently being proposed and implemented to address the increase in resistance to antibiotics.
- Recognize the changes in the parameters of antibiotic therapies in the dental practice of pediatric patients.

*Methodology of the review:* A literature search was made in the databases of: Medline, Scielo, The Cochrane Library, PubMed, and on the WHO website. Only articles were included from 2004 to 2018. Keywords: “Antibiotics; antibiotic resistance; Antibiotic prophylaxis; Oral infection.”

*Results and discussion:* The studies place Spain among the countries with the highest resistance rates. The action taken in recent years has been effective for raising awareness about the correct use of antibiotics, avoiding their indiscriminate use. In the field of dentistry there have been no recent studies on resistance, and in addition no changes have been established on antibiotic administration guidelines in a concrete way. More recent studies are needed to establish specific guidelines for these.

*Conclusions:*

1. The numbers of infections by resistant organisms are alarming and they increase every day.
2. Multiple proposals are being made, among them the most important are to educate and raise awareness.
3. Traditional antibiotic regimes remain virtually unchanged in the field of pediatric dentistry in the face of this problem.

### 223. SILVER DIAMINE FLUORIDE AS AN AGENT FOR THE PREVENTION AND CONTROL OF CARIES. PROTOCOL FOR ACTION IN A HOSPITAL ENVIRONMENT

**Gallegos, D.O.<sup>1</sup>; Brunet, Ll.<sup>2</sup>; Gómez, N.<sup>3</sup>; González, Y.<sup>1</sup>**

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*Introduction and justification:* Early childhood caries (ECC) is a condition in which there are one or more carious lesions in teeth that are absent or treated before 71 months of age. When this happens before the age of 3 years, any sign of a lesion is indicative of severe early childhood caries, which is a public health problem. Conventional restorative treatment is difficult to implement in young children with severe ECC and in those that are difficult to handle. In some cases the approach must be performed under general anesthesia, which increases the costs and risks for the patient. This situation has led to the search for alternative treatments for the control of carious lesions. Recent years has seen the reintroduction of silver diamine fluoride (SDF), which is a good antibacterial and remineralizing agent. It is an effective therapeutic agent for the control and management of carious lesions due to its efficacy, accessibility, safety and easy application. The justifi-

fication for the review is to establish a protocol of action in patients who are on the waiting list for dental treatment under general anesthesia.

*Methods:* A literature search was conducted in PubMed/MEDLINE and Google Scholar in the last 10 years. The keywords were: dental caries, treatment, prevention, diamine silver fluoride. The articles were selected that recorded: the type of dentition, application protocol, concentration of the product and possible complications of the treatment with the use of the SDF.

*Results:* 208 related articles were obtained from which 25 were chosen according to the aforementioned criteria. The average age recommended for the use of SDF ranged from the first year of life to 12 years, and in most of these it was applied in the deciduous dentition. The samples analyzed were varied from 50 to 1016 patients. The recommended concentration of SDF was 38% and the application protocol was biannual. In the literature, the only complication that was reflected was esthetic because of the staining that SDF causes, and which did not restore the structure of the teeth.

*Conclusions:*

1. Silver Diamine Fluoride therapy can be effective in controlling caries in pediatric patients.
2. An action protocol in primary health care for patients who do not have immediate access to conventional restorative treatments should be established. SDF therapy may be more effective than other treatments for the monitoring and progress of caries.

### 224. COMPARISON OF THREE FIXED AND THREE REMOVABLE FUNCTIONAL DEVICES FOR TREATING CLASS II DIV 1 WITH MANDIBULAR HYPOPLASIA. ADVANTAGES AND DISADVANTAGES

**Osorio Cruz, E.<sup>1</sup>; Austro, M.D.<sup>2</sup>; Chiva, F.<sup>2</sup>; Nicolás Silvente, A.<sup>2</sup>; Fontanillo, D.<sup>3</sup>; Alarcón, J.A.<sup>4</sup>**

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*Introduction and justification:* To analyze skeletal and dental changes in patients with Class II div 1 malocclusion and mandibular retrognathia after wearing functional appliances. To analyze mandibular growth and dental changes with the different removable appliances (Twin Block, Bionator and Fränkel) and fixed ones (Forsus, Herbst and Austro Repositioning) and evaluate if removable or fixed functional appliances are more effective.

*Methodology of the review:* Articles published from the year 2000 to the present were reviewed in the PubMed database. The search yielded 2644 articles, of which 41 were finally selected. The inclusion criteria were scientific rigor, a control group, cephalometric studies at the start and finish, and

growing patients. The exclusion criteria were articles focusing on other functional devices that were not being studied.

*Results and discussion:* The main dentoskeletal changes after the use of functional appliances were: increase in mandibular length, decrease in the ANB angle and increase in the SNB angle. There were improvements in overbite and overjet together with retro-inclination of the upper incisors and pro-inclination of the lower incisors.

*Conclusions:* Both fixed and removable functional devices significantly improve Class II div I malocclusion. The removable and fixed devices that showed the best results were Bionator and Austro Repositioning. Fixed functional devices do not require patient cooperation, they are more effective and the treatment is shorter.

## 226. RESIN INFILTRATION: MINIMALLY INVASIVE TREATMENT FOR ENAMEL HYPOMINERALIZATION OF THE ANTERIOR TEETH

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*Introduction and justification:* After the development of dental surgery within the field of dentistry, there is a trend to treat caries from a biological perspective, taking into account demineralization and remineralization depending on the pH of the oral environment and salivary flow. This treatment is included in the term Minimally Invasive Dentistry (MID), based on the prevention of caries, early diagnosis, remineralization of the enamel and restoration of lesions under the premises of minimal intervention, while being as conservative as possible. White lesions of the enamel have as a common characteristic the hypomineralization of the tissue, appearing as opaque spots due to the refraction of the light in multiple directions. The etiology of these lesions may be due to incipient caries, post-traumatic defects, Molar Incisor Syndrome, fluorosis, etc. The use of resin infiltrations increases the resistance of hypomineralized enamel and reduces the lesions in the incisors that affect esthetic appearance. They may be a more suitable option in the case of these teeth, while avoiding the use of more aggressive techniques.

*Methodology of the review:*

- Medline databases, and PubMed, Cochrane and Medes search engines.
- Key terms: Resin Infiltration, Icon, Enamel Hypoplasia, Molar Incisor Hypomineralization.
- Selection criteria:
  - Year of publication: 2007- 2018.
  - Journal impact factor.
  - Terms of study explained concisely.

*Results and discussion:* The caries infiltration technique was developed and investigated for the first time by the University of Berlin, Germany. This technique involves the penetration of resin into the lesion of the enamel that, given its low viscosity and high impregnation coefficient, is driven by capillary action, depending on time. This infiltration technique has been shown to hamper or even stop the progression of caries *in vitro*, even in aggressive environments. The results obtained in the reduction of incipient carious lesions or in the defects after the use of fixed orthodontics are promising, although in the MIH lesions only some of the lesions were reduced and they did not disappear completely.

*Conclusions:* In general, the masking ability of resin infiltration is dependent on the histology and severity of the lesion, especially in mild to moderate disorders. In the most severe cases, color masking is not good and more aggressive techniques will be necessary.

## 243. MANDIBULAR ADVANCEMENT AS AN ALTERNATIVE FOR THE TREATMENT OF PEDIATRIC OBSTRUCTIVE SLEEP APNEA IN CHILDREN

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*Introduction:* Pediatric obstructive sleep apnea syndrome (OSA) is defined as a respiratory disorder during sleep characterized by a partial or complete obstruction of the upper airway that alters normal ventilation during sleep and its patterns. It is associated with symptoms that include habitual nocturnal snoring, sleep difficulties and/or behavior problems. This frequent, chronic and progressive disorder is associated with increased cardiovascular, neurocognitive and metabolic morbidity, poor quality of life and increased mortality. It affects 2% of children between the ages of 4 and 5 years. The main cause of OSA is an overgrowth of the tonsils and adenoids, which is why the first treatment of choice is surgery. Other therapeutic options include: changes in lifestyle habits and diet, use of mechanical elements such as CPAP and Intraoral mandibular advancement devices (MAD). Recent studies indicate that MAD is an alternative treatment for mild to moderate OSA at an early age, which improves the lingual position and corrects oral respiration, modifying growth disorders and craniofacial development.

*Objectives:* a) to evaluate the effectiveness of the mandibular advancement in the treatment of pediatric OSA; and b) identify the different MADs that currently exist for the treatment of pediatric OSA.

*Material and methods:* A literature review was performed of articles from the last 10 years in digital databases (PubMed, Scimedirect, Scielo and Scopus), with the keywords (MeSH terms): mandibular advancement, myofunctional therapy, pediatric OSAS, Pediatric sleep breathing disorder. The inclusion and exclusion criteria were applied following the PICO (Population, Intervention, Comparison, Outcome) strategy.



**Results:** A total of 45 articles were identified that fulfilled the inclusion criteria and the complete texts were analyzed. After reading these, 37 of them were discarded and only 8 articles were finally included in the review.

**Conclusion:** Although the number of studies included was limited, MAD as a therapeutic option, can be effective for the management of pediatric OSA. More studies with a larger sample size, specific inclusion and exclusion criteria and standardized data reports are needed to be able to establish guidelines for the pediatric dentistry management of pediatric obstructive sleep apnea.

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## CLINICAL CASES

### 28. MODIFIED STAMP TECHNIQUE FOLLOWING ROOT CANAL THERAPY

**Morales-Villalpando, D.A.<sup>1</sup>; Moreno-Espinoza, J.O.<sup>1</sup>; Rodríguez-Olguín, E.<sup>1</sup>; de la Cruz-Corona, B.<sup>1</sup>; Verdugo-Valenzuela, I.A.<sup>2</sup>; Gómez Llanos-Juárez, H.<sup>2</sup>**

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**Introduction:** The stamp technique is described as a procedure that reproduces the original anatomy of an affected tooth. It is a restoration with direct composite resin by means of a mini-impression carried out previously with a paste, silicone, resin or some other component. Studies confirm that when a deficient anatomic occlusal reproduction of molars is created, function could be affected and occlusal trauma can arise due to premature contact. The application in pediatric dentistry of the occlusal stamp technique can be a viable option as a direct restoration for young permanent teeth when the aim is to preserve the greatest amount of dental tissue possible and to avoid other restorations that involve greater wear such as a crown or inlay.

**Case report:** Female patient aged 13 years, who appeared to be in good health, attended the Pediatric Dentistry Specialty Clinic of the Autonomous University of Pediatric Dentistry of Baja California, Mexico. She had a dental history of root canal therapy in lower left first molar as a result of caries, the main reason for the visit. During the intraoral inspection an anterior open bite was observed with lingual projection, in addition to multiple carious lesions and provisional restorations in the lower left permanent first molar that was asymptomatic. Radiography revealed tooth 36 with root canal therapy but no disease. A Class I restoration was diagnosed with glass ionomer of tooth 36. The definitive restoration of the lower left first molar was performed with composite resin using the stamp technique. During the first appointment an impression was taken in order to obtain the work model for the waxing up and mini-impression. During the second visit complete

isolation of the operating field was carried out. Local anesthetic was not needed and the stamp technique was started. The clinical follow-up was of 3, 6 and 12 months and the restoration appeared clinically and radiologically intact, with a good marginal seal and performing its function.

**Conclusion/comments:** The modified stamp technique was effective in the tooth with previous root canal therapy after following the instructions and handling of the dental materials properly. This led to ideal occlusal characteristics and esthetics, reduction in work time, restoration of function and a reduction in postoperative discomfort caused by occlusal interference. Given the advantages offered and that it is innovative treatment in dentistry, this technique is recommended for young permanent molars. Clinically it is above conventional operative procedures.

### 61. THE USE OF THE SELF-LOCKING DEVICE FOR TREATING THE ECTOPIC ERUPTION OF AN UPPER PERMANENT MOLAR

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**Introduction:** The ectopic eruption of the upper first permanent molar is a relatively common occurrence that is the result of a malposition of the permanent tooth bud and/or the tooth not following its usual course which results in it impacting the distal part of the second primary molar. Without treatment half the cases self-correct spontaneously, the eruption path will be modified and the tooth will arrive in its correct position in the dental arch. If its path is not corrected, it may progressively impact the distal root of the second primary molar. In this case, this spontaneous development will lead to a considerable loss of space in the arch, and for this reason an early diagnosis is very important as suitable treatment should be started in order to modify the eruption course of the molar and to conserve the second primary molar. Given this, the aim of the present study was to present the efficiency of the self-locking device using a series of cases.

**Case report:** The use of the SLF device is described and various clinical cases are presented of patients that attended the Master's course in Pediatric Dentistry of the Complutense University of Madrid with ectopic eruptions of the first permanent upper molar. In the cases presented the clinical management is described, together with the placement and monitoring of the SLF until the correct positioning of the molar. The use of the SLF device should take into consideration the therapeutic options in cases of non-corrected ectopic eruption of the upper permanent first molar. The treatment of choice consists in modifying the eruption path of the permanent molar, to place it distal to the primary molar, in order to preserve the length of the arch. Dentists should carry out an early diagnosis and rigorous monitoring. As an alternative to

the problem, there are numerous devices to treat the ectopic eruption of a permanent molar that try to reposition it correctly in the arch. On the Pediatric Dentistry Master's course we use the SLF devices as they are simple and efficient, comfortable for the patient and the cost is reasonable.

*Conclusions/comments:* The SLF device could be the treatment of choice for treating ectopic eruptions of upper permanent first molars, as it simply and efficiently guides the tooth into place, thus avoiding a loss of space in the dental arch.

### 63. INTRAORAL SCHWANNOMA OF THE LOWER LIP IN A PEDIATRIC PATIENT

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*Introduction:* The schwannoma is a rare neurogenic tumor that arises in the peripheral neural sheath. It is also known as a neurilemoma or neuroma. It is a benign mesenchymal neoplasm which is largely made up of a proliferation of Schwann cells. They are generally well-defined, encapsulated and slow growing. They represent approximately 5% of all benign tumors of the soft tissues and have shown a preference for affecting the sensory nerves. Between 25 and 40% of all schwannomas occur in the head and neck, and only 1% arise in the oral cavity. The lower lip is a very rare location for this tumor.

*Case report:* Male patient aged 8 years presents at the Specialist Clinic of Pediatric Dentistry of the UABC because of an abnormality of the lower lip. He is referred to the pathology, oral medicine and maxillofacial departments. On clinical examination a firm but mobile papule is found on the lower lip, which is easier to identify through the lower right lip mucosa, and which is 0.8 cm in diameter approximately. The mucosa that surrounds it is the same as the mucosa that encompasses it, and it light yellow in color. It is asymptomatic and the time it has been developing is not known. A questionnaire and a physical examination were carried out. The patient had no history of disease. Erythematous areas were observed that were inconsistent and diffuse in the frontal area, back of the neck and midline of buttocks consistent with hemangiomas. Lab studies were requested and normal values were found and excisional biopsy is decided following a differential diagnosis of mucocele vs. epidermoid cyst vs. dermoid cyst. On cutting open the lesion it was discovered to be enclosed in a capsule, which permitted complete dissection. Macroscopically it was oval in shape, with a smooth surface, white color, and firm, measuring 0.7 x 0.6 x 0.5 cm. Under the microscope a capsule of conjunc-

tive tissue was observed surrounded by a proliferation of Schwann cells organized in a pattern of Antoni A, Antoni B and Verocay bodies. The final diagnosis was of intraoral Schwannoma. The postoperative period was uneventful and healing was adequate. He made favorable progress over 12 months.

*Conclusions/comments:* It is important for pediatric dentists to carry out proper clinical examinations and anamnesis in order to diagnose and adequately treat these oral anomalies. Also important is working together with other health areas in order for patients to receive quality care.

### 66. EARLY TREATMENT OF MALOCCLUSIONS WITH PLANAS DIRECT TRACKS OF COMPOSITE (NOR)

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*Introduction:* There are various types of malocclusions that are detected early on but, in general, these are not initially treated. In many cases, if these are not corrected at an early age, they lead to irreversible orofacial disturbances at an adult age. Neuro-occlusal rehabilitation, invented by Pedro Planas, serves as a solution for many of these situations by means of simple direct composite tracks that guide the growth of the jaws towards normal occlusion, keeping a proper balance in the mouth to enable correct development.

*Case report:* Various cases are presented of posterior unilateral crossbite in the child or mixed first phase dentition, treated by means of fitting Planas Direct Tracks made of composite and selective grinding to center the mandibular midline, modify the Planas functional masticatory angle, and redirect the usual mastication side based on the "law of minimal vertical dimension" which leads to the harmonious growth of the jaws. Various cases of disto-occlusion are presented in the primary dentition, corrected with the Planas Direct Tracks. Thanks to these tracks the pathological occlusal plane is changed in the patients, making it parallel to the Camper plane, guiding in this way the growth of the jaw and the eruption of the secondary molars towards Class 1. For this the technique of directly placing the composite tracks on the patients and the indirect technique have been used. The indirect technique involves more preparation and lab work, but working time on the patient's mouth is considerably shortened.

*Conclusions:* The composite direct tracks put forward by Pedro Planas are early treatment that is successfully correcting unilateral posterior crossbites and disto-occlusions. They are easy to use once the technique is known and are economical. They are ideal for correcting malocclusions as soon as these are detected, which otherwise would turn into irreversible or difficult to solve malocclusions.

## 68. APICALLY POSITIONED FLAP FOR RETAINED UPPER INCISORS

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*Introduction:* Tooth retention is when the time for eruption arrives, and the tooth is inside the jaws, maintaining the integrity of the pericorony, intraosseous or subgingival sac. The causes are: irregular position, adjacent pressure, lack of space, supernumerary tooth, prolonged retention of the primary tooth, cysts and trauma. In the adolescent and young adult population, it has a prevalence of 2.9% to 13.7%. Third molars, canines, second premolars and upper central incisors are the most common. Treatment options: operculectomy, extraction and excision of the germ. Some authors advocate using a flap-type technique for the eruption of a retained maxillary canine, others the apical technique for anterior teeth and orthodontic management. The apical flap is indicated for the surgical exposure of a tooth retained on the buccal aspect, which allows removing the gingiva attached to the neck of the embedded tooth, encouraging periodontal health and a good esthetic appearance, but without gingival recession. The disadvantages are gingival disturbances such as thicker gums or scars.

*Case report:* An 8-year-old female patient attended the Specialty Clinic in Pediatric Dentistry of the Autonomous University of Baja California, Mexico. The intraoral clinical inspection revealed the absence of upper incisors, an area covered by gingival tissue, inflammation and ischemia, tooth 52 with grade III mobility due to approaching exfoliation and multiple carious lesions. In the radiographic examination, teeth 12, 11 and 21 were subgingival, and tooth retention of permanent upper incisors was diagnosed. An apical flap and extraction of tooth 52 were advised, with asepsis of the area and topical gel anesthesia, infiltration of two 1.8 ml cartridges of 2% mepivacaine with epinephrine, with painless supra-periosteal infiltration technique from canine to canine and in palate. Apical flap with Orban knife, with releasing incision to the mesiobuccal aspect of tooth 13, and distobuccal to tooth 21 and incisal. Complete apical flap was raised using 24G periosteal elevator, doubling the flap back towards the mucogingival line, lateral uninterrupted sutures, apical and periosteal suturing with 4/0 silk and 52 extraction. Post-operative and analgesic care. Removal of sutures a week later, accumulation of bacterial dental plaque, recommendations on prevention protocol. The three-month follow-up revealed gingival inflammation, open bite and teeth in the process of eruption.

*Conclusions:* The apical flap for retained upper incisors is an alternative for maintaining the integrity of periodontal tissue in pediatric patients.

## 115. COMPARISON OF CLINICAL BEHAVIOR BETWEEN PEDIATRIC ZIRCONIUM CROWNS AND METAL CROWNS IN PRIMARY MOLARS: 5 CLINICAL CASES

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*Introduction:* There is a great variety of materials for restoring compromised primary teeth because of tooth decay. Prefabricated metallic crowns are the first material of choice for these types of restorations. However, they do not meet the esthetic demands of patients. For this reason zirconium crowns are an alternative for restoring these teeth after pulp treatment as they have similar properties to a metal and the color is similar to that of a tooth.

*Case report:* 5 clinical cases were randomly selected out of an experimental group of patients treated at a dental clinic who required split mouth restoration work with NuSmile ZR<sup>®</sup> (NuSmile, Houston, USA) esthetic zirconium crowns and a metallic crown (3MTM ESPETM) in primary molars. After a clinical and radiographic examination, the parameters that were evaluated for comparing one material with another were: periodontal health, retention, fracture resistance, radiographic changes of the alveolar bone and parental satisfaction. Monitoring was carried out at 6, 12 and 24 months.

*Conclusions/comments:* The use of NuSmile ZR<sup>®</sup> zirconium crowns in pediatric patients represent an excellent alternative for restoring primary molars compromised by decay, and following pulp therapy. The esthetic appearance and the clinical compromise of these crowns demonstrate that they are a restoration treatment that should be kept in mind by both parents and dentists.

## 117. TREATMENT OF INFLAMMATORY FOLLICULAR CYST BY MEANS OF HAWLEY DECOMPRESSION APPLIANCE

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*Introduction:* Inflammatory follicular cyst (IFC) is a rare disease of the jaws that appears radiographically as a radiolucent image in the area of the root of a primary tooth and that encompasses the crown of the permanent tooth. These cysts arise for two reasons: necrosis of the primary tooth or failure of pulp treatment in the primary dentition. This type of cyst can be resolved in various ways depending on the size and the effect it is having. There are various types of treatment such as: extraction of the primary tooth involved, marsupialization/decompression with Hawley type drainage appliance, or enucleation to avoid recurrence. A study was carried out in the Sant Joan de Déu Hospital (HSJD) in order

to establish a treatment protocol for IFC using decompression and a Hawley appliance.

*Case report:* We obtained a sample of 15 patients diagnosed with IFC in the HSJD in Barcelona. The mean age of the patients was 8.6 years on diagnosis, and 93.33% were males. We observed that 60% of the sample was due to pulp therapy failure and 40 to necrosis of the primary tooth. 80% of the cysts appeared in the mandible and only 20% in the maxilla. In relation to the treatment carried out to resolve the disease, we found that 40% of the cases were resolved by extraction of the primary tooth, 46.7% with extraction and decompression using a Hawley appliance and 13.33% required cystectomy/complete enucleation. For the study a diagnostic panoramic radiograph was made together with periapical radiographies during the follow-up and a Hawley-type plate was made with a Penrose-type drainage tube for those cases that required one.

#### Conclusions:

1. It is important to control pulp treatment over time. In order to diagnose IFC correctly, dentists should be familiar with the signs and symptoms, and a proper clinical and radiographical examination should be performed.
2. The right treatment is very important as failure could lead to inclusion or absence of future permanent teeth.
3. Treatment by means of Hawley decompression is a less invasive option and more conservative, as the permanent tooth stays in the mouth. The disadvantage of this technique is that it involves a certain amount of patient cooperation with the appliance, and the results are less predictable with regard to the total enucleation of the cyst.

### 147. REMINERALIZING EFFECT OF FLUORIDE VARNISH ON INCIPIENT CARIOUS LESIONS

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*Introduction:* Incipient caries causes minimal structural damage that does not compromise the functional integrity of the tooth. Clinically a whitish area, which is opaque and has lost translucency, is identified. DIAGNOdent Pen<sup>®</sup> is a diagnostic method for measuring a carious lesion quantitatively as it measures fluorescent light which is interpreted on a scale of 0 to 99. Fluoride increases the resistance of the tooth to acid attacks and it favors remineralization of the damaged enamel by means of a physicochemical process that consists in introducing calcified material into the dental structure which will replace what has been lost through demineralization. In 2012 Da Silva et al. evaluated the remineralizing effect of two fluorides on incipient carious lesions concluding that they had

similar clinical efficiency after four weeks of therapy. Trejo et al. found that the clinical efficiency of 5% Sodium Fluoride varnish (NaF) was statistically significant when comparing baseline caries index with final caries index.

*Case report:* Male patient aged 6 years presented at the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, Tijuana, Mexico. The examination revealed brachyfacial extraoral biotype, and a straight profile. The intraoral examination revealed mixed dentition, stage 2, with anterior crossbite and multiple carious lesions. Rehabilitation consisted in pulp therapy, placement of stainless steel chrome crowns and resin restorations. The DIAGNOdent Pen<sup>®</sup> for diagnosing caries in 73 gave a value of 22 points and in 83 of 24 points, which indicated incipient carious lesions. A prevention protocol was started and remineralizing therapy was recommended. MI Varnish<sup>®</sup> was applied at 1, 3, 6 and 9 months, which gave satisfactory results as the values using the DIAGNOdent Pen<sup>®</sup> were reduced by 13 points.

*Conclusions/comments:* The early identification of incipient carious lesions using DIAGNOdent Pen<sup>®</sup> allows carrying out minimally invasive treatment such as the application of fluoride varnish that favors the remineralization of those dental tissues affected and prevents the progression of carious lesions. In this case report we were able to conclude that MI Varnish<sup>®</sup> was an excellent treatment option given the efficiency obtained in the results, which highlights the preventative role of fluoride varnish for preserving the mineral structure and mechanical integrity of the enamel against acid-induced demineralization.

### 155. BILATERAL HYPERDONTIA AND DENTAL FUSION DURING THE PRIMARY DENTITION

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*Introduction:* Supernumerary teeth have a prevalence of 0.3-0.8% in the primary dentition and 0.1-3.8% in the permanent dentition, and they are 8 to 10 times more common in the upper jaw and in the male sex. Fusion is a dental anomaly of form that arises as a result of the complete or partial union of dentine or the enamel of two or more developing tooth germs. It frequently involves supernumerary teeth which results in a differential diagnosis with gemination. The prevalence of fusion in the primary dentition is 0.5-2.5%. The fusion of primary teeth is usually unilateral. Hagman reported that when fusion involves a primary canine, the probability of a missing successor tooth was 75%.

*Case report:* Female patient aged 4.5 years presented at the Pediatric Dentistry Specialty Clinic with carious lesions.

The extraoral examination revealed reduced upper third, lip incompetence and oral breathing. The clinical inspection revealed generalized gingivitis with biofilm, pronounced horizontal overbite due to a lip sucking habit, multiple carious lesions with root resorption, bilateral supernumerary teeth between the upper lateral incisor and canine, and tooth 63 which had fused with another supernumerary tooth. Radiographically supernumerary teeth were observed between 52 and 53, 62 and 63, and a supernumerary tooth fused with 63 each with its own root, fused up to the clinical crown, with radiolucency around the crown due to a deep carious lesion in 63. *Diagnosis:* dental caries, two bilateral upper supernumerary teeth and fusion of 63 with another supernumerary tooth. *Treatment:* a prevention plan was started to encourage gingival health and to eliminate the biofilm. Integral rehabilitation was performed with pulpotomies and stainless steel crowns, and extraction of teeth 52, 51, 61, 62, 74, 75, 84, 85 and removable upper and lower child prosthesis were placed. Extraction of supernumerary teeth was performed between the left and right lateral incisor and canine, conventional pulpotomy on fused tooth 63, restoration with glass ionomers and resin. Instructions for parents: maintain periodic control of the supernumerary tooth fused with the canine as there will be no physiological exfoliation. *Progress:* The patient showed improvement in oral health and attended periodic follow-up appointments for the supernumerary tooth fused with the canine.

*Conclusions/comments:* A differential diagnosis is essential in order to determine the presence of supernumerary teeth and dental fusion. When extraction is not carried out of the supernumerary tooth during the primary dentition, periodic monitoring should be performed.

### 175. CORRECTION OF ANTERIOR CROSSBITE WITH PLANAS DIRECT TRACKS IN THE PRIMARY DENTITION. A CASE REPORT

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*Introduction:* The fundamentals of biology, growth and development dictate that most malocclusions begin as mild and become worse over the years. In the case of anterior crossbite in the primary dentition, the development energy received by the mandible is not transmitted to the upper jaw, resulting in its underdevelopment. During mastication, the mandible only makes movements of protrusion and retrusion, and when performing lateral movements these follow the path of a Gothic arch, which is very closed at the front. This stimulates the condyles causing an increase in mandibular development.

With a hypodeveloped maxilla and a hypertrophied mandible that is maintained over time, a dental and skeletal class 3 will be established that will worsen throughout the growth

period. Dr. Pedro Planas solved these mandibular hypertrophies with Flat Tracks which are applied at the earliest age possible to stop this mandibular growth and return the correct relationship and function to both jaws, so that they grow in a more balanced way.

*Case report:* Our team applied what is described above in the case of a 5-year-old girl with completed primary dentition, and anterior crossbite in maximum intercuspation and edge to edge bite in the centric relation which was treated with tracks made in restorative material from tooth 52 to tooth 62. The tracks were waxed in the articulator, and an inclined plane was established in the incisal edge of the upper incisors that was not surpassed by the lower ones in anterior occlusion. Lateral assessment was also made of incisal contact and that the PMFAs (Planas masticatory functional angle) were approximately 0°. They were transported using a transparent silicone key to the mouth of the patient who had disocclusion of the posterior teeth. A month after treatment, there was posterior occlusion and vertical and horizontal physiological overjets. Favorable changes in her profile and smile could be observed. She is currently a year into her monitoring and follow-up.

*Conclusion:* Anterior cross-bites can be resolved in clinics easily, and without appliances. It still has to be assessed whether properly adjusted occlusion and parafunctions avoid orthodontic treatment at a later date. And also, if better development of the maxilla is favored, and if mandibular hypertrophy can be halted as a result of less condylar growth.

### 192. PEDIATRIC PATIENT WITH DISORDER OF THE TEMPOROMANDIBULAR JOINT AS A RESULT OF TRAUMA TREATED WITH FUNCTIONAL ORTHOPEDICS

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*Introduction:* Oral health implies not only the absence of disease, but also an esthetic and functional balance. Pediatric dentists are able to assist patients at a very early age, and functional orthopedics offers possibilities to act at a dental, bone and muscular level. The objective of functional orthopedics is to look for functionally balanced occlusion at the different ages of the child. Maxillomandibular growth and development pass through a complicated combination of apposition and bone resorption, from areas of the soft tissues lining the bone, which is called "remodeling". The child is born with a physiological state that is "disease free", and a perfect balance between the structures and their functions. The normal process of occlusal development can be altered by genetic, environmental and functional factors. They can occur in a transverse, sagittal and vertical direction, and be structural or functional. The objective of temporo-mandibular disorder (TMD) treatment in children and adolescents includes the res-

toration of joint and masticatory function, and the reduction of pain. The therapeutic approach consists of a balance between the two treatment modalities: active and passive. The active type includes the participation of the patient, and the passive type the use of special splints for stabilization.

*Case report:* A 10-year-old female patient reported a traumatic injury a year previously in the chin area, and currently with headache and neck pain. In the clinical examination we observed facial asymmetry, mouth opening of 28 mm, low tongue posture, class III molar relationship, TMJ pain, lateral

displacement and also on opening and closing. The diagnostic aids included: clinical photograph, lateral X-ray of skull, orthopantomography and X-ray of TMJ on opening and closing. A Simões Network 5 (SN5) orthopedic device was fitted.

*Conclusions/comments:* The Simões Network technique works by modifying posture, thus acting on the Neuromuscular Tonus, which is chiefly responsible for bone growth remodeling. The SN5 model is also known as the Special Brake Connection, taking care of the Determined Area (DA), allowing it to work as a force breaker.