

## Poster communications

### RESEARCH STUDIES

#### 8. EFFECT OF INHALED MEDICATION ON THE ORAL HEALTH OF ASTHMATIC PATIENTS

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*Introduction and objectives:* Currently, and with increasing frequency, respiratory disorders are affecting a large percentage of the child population. The literature reviewed in this research project shows that the use of inhaled medication for respiratory conditions is related to adverse reactions such as erosion, dental caries, gingivitis, halitosis or xerostomia. The objective of the present study was to evaluate the relationship between the use of inhalers and the appearance of dental caries, as well as to establish a preventive protocol that is appropriate for these effects.

*Methods:* Firstly, an exhaustive literature review was carried out on the effects of inhaled medications on oral health, with the following keywords: asthma, children, inhaled medications, salivary flow, caries risk. Following this, a study was conducted on a sample of 40 children with some type of respiratory disease who were receiving medical inhalation treatment, at the Pediatrics department of the Health Center of Coria (Cáceres). A survey and a clinical examination were carried out in order to associate habits and oral health status with other variables related to the use of inhalers.

*Results:* Salbutamol was the drug most frequently chosen for the treatment of respiratory conditions among the children in the sample. In relation to the exposure of patients to fluoride in oral rinses, it was found that 42.5% of the children used them while 57.5% of them did not. 85% of the children examined, all with inhaler treatment, had tooth decay at the time of the examination.

*Conclusions:*

1. The prevalence of caries was 85%, so it can be concluded that there is a direct relationship between the use of inhaler-type drugs and the presence of caries ( $p < 0.005$ ).
2. With all the data obtained, a detailed and specific prevention protocol was designed for this population group, which should be treated as high risk for developing oral conditions, in addition to an information leaflet for the parents of these children.

#### 10. CHANGES IN ORAL HEALTH-RELATED QUALITY OF LIFE WHEN ASSOCIATED WITH THE TYPE OF CLEFT LIP AND/OR PALATE IN SURGICALLY TREATED CHILDREN

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*Introduction and objectives:* The most common craniofacial malformation in children is the cleft lip and/or palate and the treatment is multidisciplinary. The primary surgical repair of the cleft lip and/or palate is performed in the early stages of life. There is little consensus regarding its effects on oral health related quality of life (OHRQL) in infants. The objective of this study was to determine the association between changes in OHRQL and the type of cleft lip and/or palate in children treated surgically after a period of 12 months.

*Methods:* This was a longitudinal study that included 106 children under 24 months with a nonsyndromic cleft lip and/or palate, who were operated at the National Institute of Child Health in Lima, Peru. A questionnaire on quality of life related to oral health was applied which was the Peruvian version of the Early Childhood Oral Health Impact Scale (P- ECOHIS), addressed to the parent/caregiver of the child. It was applied before (basal = 2 weeks before) and after (12 months) of the surgery. The difference in the total score of the P-ECOHIS before and after the intervention was evaluated as the change in OHRQL, which was associated with the type of fissure. A univariate and bivariate analysis of the data was performed. To evaluate what type of fissure underwent the best change, a multiple linear regression model adjusted by confounders was performed. The Spanish Stata statistical program version 15 was used.

*Results:* The cleft lip and/or palate arose far more frequently in male children (59.4%). Regarding the type of fissure, the lip/palate arose more frequently (77.30%) compared to the cleft palate (12.30%) and the cleft lip (10.40%). OHRQL improved significantly 12 months after surgery in all cases ( $p < 0.001$ ). This improvement was also associated with the child's age. The improvement was greater in older children ( $p < 0.001$ ). The improvement was associated with the baseli-

ne measurement, and the improvement was greater, the worse OHRQL was before the intervention ( $p < 0.001$ ). In the multivariate analysis, it was found that children with cleft lip and palate had better changes in their OHRQL than those with cleft lip, and this result was statistically significant ( $p < 0.001$ ).

*Conclusions:* There were positive changes in OHRQL associated with the three types of cleft lip and/or palate following surgical treatment.

## 25. CONNECTION OF EACH TOOTH WITH THE FIVE ELEMENTS AND ORGANS

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*Introduction and justification:* Traditional Chinese Medicine (TCM) considers the patient as a whole, since there is a connection between all the organs and the mind. Therefore, a functional balance of the forces must be maintained, which when altered, creates repercussions such as the appearance of diseases. TCM, based on the theories of Ying Yang and the theory of the five elements: wood, fire, earth, metal and water, makes us understand the association between the different organs of the body with the teeth. Therefore, the objective of the study was to analyze the correspondence of each tooth with the five elements and the organs.

*Methodology of the review:* To perform a systematic review in the electronic database of PubMed, Scielo and Medline using the keywords: “Traditional Chinese Medicine”, “Qi”, “Ying-Yang” in the search engine.

*Results and discussion:* The incisors correspond to the water element and reflect the state of the kidneys, bladder and ears. The canines correspond to the wood element and reflect the state of the liver and gallbladder. The maxillary premolars are associated with metal and reflect the state of the lungs and large intestine, and the mandibular premolars are associated with the earth and they reflect the state of the stomach and pancreas. The first two upper molars correspond to the state of the stomach and pancreas and the lower ones are linked to fire and to the heart and small intestine. The third molars reflect the condition of the heart and small intestine.

*Conclusions:* Of the theory of the five elements, the most important element for dentistry is water since it has multiple points of specific action on the innervation of the oral cavity and teeth, especially the meridian of the kidney, since the teeth are governed by it. Due to this relationship between the organs and the teeth, a problem in an organ can transform into a dental condition.

## 57. PREVALENCE OF DENTAL ANOMALIES AMONG A GROUP OF MEXICAN PEDIATRIC PATIENTS

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*Introduction and objectives:* Dental anomalies are a variety of deviations from normal. They arise during the development of the teeth, generating malocclusions and affecting the stomatognathic system. They may even go unnoticed, as some are only discovered through a radiographic study. Studies have been conducted in different countries, such as India where anomalies of 1.8% were reported in the primary dentition, 0.5% hypodontia and 0.5% fused teeth. In Brazil taurodontism was observed more frequently in 27.19% of cases. In Guadalajara, Mexico, only dental agenesis was reported in 33.44%. No studies were found in Mexicans of other dental anomalies so the objective of the present investigation was to determine the prevalence of dental anomalies in Mexican pediatric patients who attended the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, Mexico.

*Methods:* This observational, descriptive, prospective and cross-sectional study included 210 children from 1 to 12 years of age, from February to November 2017, with prior signed informed consent and assent by children. The oral examination was performed in a dental unit with intraoral mirror number 4, digital radiographic study and clinical photographs, and anomalies in size, shape, number and structure were observed. Using the data collection format, the patient's name, age, gender, file number, types of dental anomalies and tooth with the anomaly were recorded. The information was collected using the SPSS program and the descriptive statistics of the variables and the nominal frequencies were estimated.

*Results:* Of the 210 cases, 81 (38.6%) patients had some dental anomaly. Ninety-six (45.7%) of the patients were female and 114 (54.3%) were males. The average age was 8 years. The prevalence of anomalies was 29 (13.8%) supernumerary, 22 (10.5%) teeth with enamel dysplasia, 15 (7.1%) teeth with agenesis, 11 (5.2%) fused teeth, 2 (1.4%) with hypoplasia, two with microdontia (1.0%), and only one case of invagination and conoid teeth (0.5%).

*Conclusions:* The prevalence of dental anomalies in pediatric patients of the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, Mexico was 38.6%. These were more common in males 54.3%. Four out of every 10 children presented some kind of dental anomaly, and the most common was 13.8% supernumerary teeth.

## 95. EFFICIENCY AND ACCEPTANCE OF PROBIOTICS IN PEDIATRIC PATIENTS UNDER ANTIBIOTIC THERAPY

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*Introduction:* Antibiotics can cause a disturbance in the composition of the intestinal microbiota, which leads to the development of gastrointestinal symptoms. Antibiotic-associated diarrhea (AAD) is a complication from using antibiotics in children. The causes include pathogens such as *Clostridium difficile*, *C. perfringens*, *Staphylococcus aureus* or *Candida albicans*, the metabolic consequences of the altered intestinal microbiota or a direct effect of antibiotics on the mucosa. The impact of antibiotics on intestinal microorganisms justifies the use probiotics to reduce the incidence of AAD. Probiotics are live microorganisms that, when administered in adequate amounts, confer a benefit to the health of the host. They potentially maintain or restore the intestinal microecology during or after treatment with antibiotics through competition of receptors, competition for nutrients, inhibition of epithelial tissue and mutation.

*Objective:* To determine the clinical efficacy and the degree of acceptance of taking probiotics in conjunction with antibiotics in pediatric patients.

*Materials and methods:* This was a descriptive study in children aged 2-15 years, with no underlying disease and who are being treated with antibiotics due to some type of infection or trauma at the Hospital de Nens of Barcelona, where they were prescribed probiotic, associated with an antibiotic, and at the Bellvitge Dental Hospital, where only the antibiotic was prescribed, for a period of 6 months. The data was collected either using a questionnaire that was completed by the parents/legal guardians or by phone. A statistical study was carried out using the data collected. To complete our research we searched the literature related to probiotics and their use in conjunction with antibiotics, published less than 10 years ago in the PubMed or Cochrane databases.

*Results:* Out of a total of 78 patients studied, of whom 39 were prescribed probiotic together with the antibiotic (25 girls /14 boys) and with the knowledge that 97% of the patients had finished the treatment, 64% took the probiotic at night, 95% took it before meals and 58% in combination with water. The flavor was not liked by 56% and for 62% the presentation format did not present any difficulty.

*Conclusion:* Regarding clinical efficacy, most patients took the probiotic at night mixed with water and before meals, thus reducing AAD. Regarding the degree of acceptance, for the majority of patients the flavor was not pleasant, although the presentation format did not present any difficulty.

## 98. IN VITRO STUDY OF TWO MATERIALS USED DURING BONDING OF BRACKETS FOR PREVENTING WHITE SPOTS

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*Introduction and objectives:* The appearance of white spots during or after orthodontic treatment is one of the problems concerning orthodontists. To prevent these, in addition to proper hygiene and proper nutrition, different materials can be used in the clinic. The objective of our study was to use a glass ionomer adhesive “Opal Seal” during the bonding of brackets to prevent white spots and to help the remineralization of the enamel around the brackets.

*Methods:* We conducted a study on 40 bovine incisors whose enamel was demineralized. These were randomly divided into 2 groups: group 1 demineralized enamel and bonding of brackets with Transbond, and group 2 demineralized enamel and bonding of brackets with “Opal Seal”. Using Diagnodent we made a measurement in triplicate on the enamel surface at 1, 2 and 3 months.

*Result:* The values of the Transbond group did not show significant differences at three months ( $12.86 \pm 1.26$  the first month;  $12.78 \pm 1.12$  the second month and  $12.67 \pm 0.19$  the third month). The group cemented with Opal Seal did not show significant differences, with a progressive decrease in values over time ( $11.35 \pm 0.8$  the first month;  $8.2 \pm 0.84$  the second month and  $5.3 \pm 0.83$  the third month).

*Conclusions:* The teeth treated with Opal Seal suffered remineralization after 3 months of its application. The teeth treated with Transbond did not undergo any remineralization for 3 months. Opal Seal could be an excellent material for preventing the appearance of white spots.

## 107. THE DENTAL ENVIRONMENT AND THE PERCEPTION BY CHILD PARENTS AGED 6 TO 12 YEARS

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*Introduction and objectives:* Anxiety or dental fear is a common situation during daily dental practice, especially in the case of child patients. For this reason, pediatric dentists are constantly trying to improve a patient’s perception of the dental environment, in order for the children who come to their consultations to have a pleasant experience. This avoids negative behaviors, facilitating in turn, their cooperation during the treatment. All this makes it necessary to investigate how the dental environment can influence the perception of those coming for a consultation. Given this, the objective

of this study was to determine how the dental environment (colors, smells, staff clothing, decoration, entertainment) is perceived by child patients between the ages of 6 and 12 years who attend the university clinic.

**Methods:** An observational, analytical and cross-sectional study was carried out. Children between 6 and 12 years of age who attended the university clinic between February and May 2019 were selected and a questionnaire was distributed consisting of 7 test questions with 4 options each.

**Results:** 57% of patients preferred blue/green for the color of the dental office and with regard to clothing, 64% preferred that their dentists use colored pajamas or ones with cartoons. 36% reported having felt fear or anxiety at the dentist on some occasions, 29% said it depended on the dentist, 29% never and 7% always. Some 36% preferred to perceive smells of fruits/sweets in the clinic, another 36% did not give any importance to the smell in the consultation room and 29% would like to perceive the smell of mint (toothpaste). Some 64% would like to listen to music in the waiting room, 43% preferred stickers, stuffed animals or cartoons as decoration and 50% preferred to have board games or a game park in the waiting room. After the statistical analysis, it was determined that no statistically significant differences were found between the preferences by age, range and sex, and a value of  $p > 0.05$  was obtained.

**Conclusions:** Most of the patients surveyed preferred blue or green colors, staff with colored pajamas and/or cartoons, smells of fruit/sweets or mint, musical sounds, children's decoration (stickers/stuffed animals/drawings) and to find board games or a game park in the waiting room.

#### 114. HOW THE MATRIX SYSTEM EMPLOYED INFLUENCES CONTACT POINT AND PROXIMAL SURFACE OF RESTORATIONS CARRIED OUT WITH BULK-FILL COMPOSITE ON PRIMARY MOLARS

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**Introduction and objectives:** Despite the difficulty to correctly reproduce the point of contact in proximal restorations of primary molars, there are no studies that have compared different matrices for this purpose. The objective of this *in vitro* study was to evaluate the influence of different matrix systems on the strength of the contact point and on the reproduction of the proximal surface of composite Class II restorations in primary molars.

**Methodology:** Artificial second primary molars were used mounted on a typodont (Frasaco) to restore class II mesial occlusal preparations with standardized dimensions, with a bulk-fill composite resin Filtek Bulk Fill® (3M Oral Care). Each restoration was randomly assigned the use of one of the following matrix systems (n = 12): 1. Straight circumferential

matrix mounted on a Tofflemire (KerrHawe) matrix retainer; 2. Circumferential matrix using the Automatrix® (Dentsply) system; 3. Composi-Tight® (Garrison) pediatric pre-contoured sectional matrix; and 4. T Composi-Tight Clear (Garrison) straight matrix piece combined with a ring. The contact point strength was measured using a universal traction machine (Instron 3345). In addition, 3D digital images were obtained of the proximal morphology of each of the restored surfaces, using the intraoral scanner True Definition® (3M Oral Care). The results were statistically analyzed by means of the one-way ANOVA test and Tukey test ( $p < 0.05$ ).

**Results:** Statistically significant differences were found regarding contact point strength ( $p < 0.05$ ). The Automatrix circumferential system and the sectional matrices obtained similar results, while the values were lower with the Tofflemire system. In all the systems, excess composite was observed in the margins, and was more striking for straight matrix section with separation ring.

**Conclusions:** The matrix system employed influences contact point strength in restorations made with bulk-fill composite resin in primary molars. None of the systems achieved the reproduction of a proximal ring without an excess of material and none were perfectly anatomical.

#### 128. THE ASSOCIATION BETWEEN MOTHERS' GUILT AND ORAL HEALTH PROBLEMS IN CHILDREN OF PRESCHOOL AGE

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**Introduction and objectives:** Dental caries and traumatic dental injury (TDI) can play an important role in the appearance of guilt in mothers, as they feel responsible for the health of their children. The objective of this study was to evaluate the influence of oral health problems of preschool children in the presence of mothers' guilt.

**Methods:** A cross-sectional study was carried out that was made up of 201 pairs of mothers and children. The children were between 36 and 71 months old and they attended preschool in the city of Pombal. The mothers answered a questionnaire that addressed the sociodemographic variables (gender and age of the child, age of the mother, education (schooling) of the mother, history of dental pain, attention to oral health and the presence of guilt. The presence of oral problems (caries and/or TDI) was evaluated. We performed a descriptive analysis to define the sample. Binary logistic regression was used to determine the importance of associations between mothers' guilt and the variables studied ( $\alpha = 5\%$ ).

**Results:** The sample was made up of 51.7% children of the male gender. The questionnaires were answered by the mothers. With regard to the schooling of the mothers, 14.9% had basic education, 43.8% had secondary education and



41.3% had university education. Nearly half the children (49.8%) had never visited a dentist and 39.8% had oral problems. 26.9% of mothers said that their children had oral problems and 17.9% of mothers reported feeling guilty about their children's oral problems. The presence of oral health problems in the children increased by about 4 times (OR = 4.131, CI<sub>0.95</sub> = 1.511-11.302) the risk of feeling guilty. In addition self-perception of the presence of dental problems was associated with an increased risk of presence of maternal guilt (OR = 4.805, CI<sub>0.95</sub> = 1.933-11.945). The need for oral health care, the age of the mother and her schooling were not associated with the increased risk of guilt. However, there was a tendency for the risk of feeling guilty to increase with the increase in maternal age.

*Conclusions:* Perceptions about the poor oral health of their children and a history of pain increase the risk of mothers' guilt.

### 129. PREVALENCE OF LESIONS IN THE ORAL CAVITY OF CHILDREN RECEIVING ONCOLOGICAL TREATMENT

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*Introduction:* Children undergoing oncological treatment have three different groups of therapeutic options: chemotherapy, radiotherapy and surgical treatment. The use of these treatments, particularly chemotherapy and radiotherapy, have adverse effects on the oral cavity, inducing the appearance of numerous lesions.

*Objectives:* We aimed to evaluate the oral health status of children undergoing oncological treatment through the study of chemotherapy and/or radiotherapy induced oral lesions.

*Methodology:* The sample was made up of 31 children, with a history of oncological disease, who were receiving or had received chemotherapy and/or radiotherapy over the previous two years, by the Hemato-Oncology Service of the São João Hospital. A clinical evaluation was carried out with a clinical record (containing personal, family and dental history) and extra- and intraoral examination, in order to evaluate the oral cavity and the oral lesions found.

*Results:* The average age of the sample was 9 years. After the analysis it was verified that 48.15% of the patients had lesions in the oral cavity, and the distribution by gender was not statistically relevant ( $p = 0.7224$ ). Of the lesions found, the most significant prevalence was of Oral Candidiasis, present in 36.84% of children with lesions ( $n = 19$ ), followed by Mucositis and oral ulcers, present in 21.05% of these children. The prevalence of other lesions such as Angular Cheilitis or Leucoedema was also verified, although in considerably lower percentages (5.26%). When the distribution of lesions was analyzed according to type of therapy, all patients with lesions

had or were having chemotherapy while only 61.54% of the children with lesions had undergone or were undergoing radiation therapy cycles. When analyzing the association between the number of times teeth were brushed and the risk of lesions in the oral cavity, the relative risk was  $> 1$  (1.388), and it was ascertained that, when children brush less than 2x/day, the risk of developing lesions increased by 38.88%.

*Conclusions:* About half the children observed had some type of oral lesion arising from radiotherapy or chemotherapy. It is absolutely essential to sensitize parents and caregivers to the types of lesions that may arise in this period, and to seek help from the multidisciplinary team that accompanies the child, which should include a dentist, together with a standardized protocol consultation.

### 130. EFFECT OF NON-NUTRITIVE HABITS ON THE DEVELOPMENT OF OCCLUSAL CHANGES AT A PRESCHOOL AGE

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*Introduction:* Non-nutritive sucking habits consist of external factors that can lead to the development of anterior open bite and posterior crossbite.

*Objectives:* To verify the correlation between non-nutritive suction habits and the development of occlusion problems, in pre-school age, during the deciduous and mixed dentition in a pediatric dentistry population sample, in the kindergartens of a town in the center of Portugal (Pombal). In addition, the study aimed to find out the prevalence of these habits, if breastfeeding is a protective factor in the development of occlusion problems and the importance given to this problem by child educators.

*Methodology:* Essential information on suction habits was collected through a questionnaire delivered to the legal guardians of the children. A questionnaire was also given to the children's educators who were included in the study in order to determine the perception given to non-nutritive suction habits. Subsequently, an oral scan was performed to analyze the presence or absence of occlusion abnormalities.

*Results:* The prevalence of habits was 62.1% for sucking the pacifier ( $p < 0.001$ ) and 7.1% for digit sucking ( $p < 0.001$ ). The correlation was weak, but statistically significant between the two habits (0.169 for digit sucking -  $p = 0.025$ -, and 0.147 for pacifier sucking -  $p = 0.038$ ) and anterior open bite. OR = 0.699 for anterior open bite which could be explained by the interaction with exclusive breastfeeding time.

*Conclusions:* The most prevalent habit identified was pacifier sucking, which was associated with breastfeeding, duration of this and bottle feeding. This habit is associated with the development of anterior open bite. A longer period of exclusive breastfeeding seems to be a protective factor against the development

of anterior open bite, even though there may be a history of pacifier sucking. All the child educators were aware of the impact of these types of habits on the growth process of the children.

### 136. DENTAL ANOMALIES OF NUMBER ASSOCIATED WITH OTHER LOCAL OR SYSTEMIC DISEASES IN PEDIATRIC PATIENTS

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*Introduction and objectives:* Dental anomalies of number have existed for millions of years. However, the etiology continues to be unknown. The importance of knowing the cause and the relationship with other diseases is decisive for a successful diagnosis and treatment plan. The aim of this work was to study the prevalence of dental anomalies regarding an excess number or shortage of teeth, and to associate this with general syndromes or other congenital disorders.

*Methods:* A retrospective study of dental anomalies affecting number was performed in pediatric patients attending the maxillofacial surgery department at La Paz University Hospital in Madrid. This study was a manual review of the radiographs available in the archives of the hospital center from 2014 to 2017. The radiographs were compared with the medical records in order to be able to relate them to the presence of pathologies. Previously, a literature review of scientific articles was carried out through PubMed and Medline with the key words: dental anomalies, supernumerary tooth and dental agenesis.

*Results:* The results obtained are presented as well as the presence of associated diseases in the patients in the study, which included ectodermal dysplasia, cleft palate and cleidocranial dysplasia.

*Conclusions:* From the clinical histories studied it was observed that there was a strong association between dental anomalies in number and other pathologies. In relation to hyperdontia, cleidocranial dysplasia stands out and, with regard to agenesis, ectodermal dysplasia. In addition, from the records reviewed containing histories of orofacial fissures we found a high number of cases with anomalies of number due to excess or lack of teeth.

### 143. HIPOMINERALIZATION OF PRIMARY SECOND MOLARS AND PERMANENT MOLAR-INCISORS AND THE RELATIONSHIP WITH FLUID INTAKE

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*Introduction:* Molar incisor hypomineralization (MIH) is characterized by asymmetric opacities that may be white,

cream, yellow and/or brown of the tooth enamel caused by changes in the calcification or maturation of the enamel of the first permanent molars and/or incisors, and also of the second primary molars called Hypomineralization of Primary Second Molars (HPSM or DMH). The exact cause is unknown. Factors such as the type of diet, solids and liquids, could affect mineral content during the maturation process or the composition or pH of certain beverages could quickly alter a hypomineralized tooth.

*Objectives:* To determine the relationship between DMH and MIH with the type of fluid intake of the mother during pregnancy and of the child during the first three years of age.

*Materials and methods:* Cross-sectional descriptive study in 80 children with DMH and/or MIH, aged 3 to 8 years, who came for monitoring or a first visit to the Hospital de Nens in Barcelona. The oral inspection was performed using the EAPD criteria. A questionnaire was filled out with information about the mother and the child, place of birth, type of fluid intake of the mother during pregnancy and of the child during the first 3 years.

*Results:* There was a total of 80 healthy children, 41 boys, 39 girls, aged 3 to 8 years, who attended for a first visit (39%) and control visit (61%) who had DHM and/or MIH. The majority of mothers (78%) had been born in Spain, 84% drank bottled water during pregnancy, 50% soft drinks, 85% cow's milk. Of the total number of patients, 66 were exclusively breastfed, 34% drank bottled water at around 12 months; 94% drank cow's milk and 61% boxed juice. The average age for introducing soft drinks to their fluid intake was 2.5 years.

*Conclusions:*

1. There is a relationship between patients with DMH, MIH, caries and early consumption of sugary drinks.
2. Some mothers reported that the child only consumed bottled water during the first 3 years, but were not aware of the type of water they had in the nursery.
3. It would be useful to know the chemical composition and proportion of minerals contained in tap and bottled water that is drunk in each province.

### 146. ORODENTAL DISEASE IN CHILDREN WITH SPECIAL NEEDS. A REVIEW OF THE LITERATURE

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*Introduction and justification:* Children with special needs are those with any disability or limiting physical, developmental, mental, sensory, behavioral, cognitive or emotional condition that requires medical management, intervention or medical attention and/or use of services or specialized programs. This group may be medically compromised and sometimes have difficulties in oral hygiene and eating. Their oral problems are the same as those that affect the rest of the population, but generally these have greater prevalence and

severity. For this reason comprehensive treatment is necessary, and this should emphasize the prevention. This literature review permitted assessing the vulnerability of children with special needs regarding oral diseases, as well as determining the need for oral health promotion in this group and contributing to further research in this field.

**Methodology of the review:** The search was conducted in PubMed and EBSCO databases, and restricted to the keywords: “disabled children”, “challenged children”, “handicapped children”, “special health care needs”, “pathologie bucco-dentaire”, “decayed and filled teeth”, “malocclusion”, “oral health”, “discapacidad intelectual”, “discapacidad motora”, using the advanced search strategy, in Spanish, English and French, and articles with access to a full text. The inclusion criteria were articles published in the last 5 years, patients with an age range of 0 to 19 years, descriptive cross-sectional studies, systematic reviews and case-control studies.

**Results and discussion:** 56 articles were found, of which 16 were selected after applying the inclusion criteria. The literature reviewed concurred that dental caries, gingivitis and malocclusions are frequent pathologies in children with special needs. The main etiological factors of malocclusions are the bad habits inherent to this group such as tongue protrusion, oral breathing, suction, speech, chewing and changed tooth positions. This group may also suffer from sialorrhea, bruxism, enamel defects, changes in the TMJ and increased risk of dental trauma, among others.

**Conclusions:** There is a high prevalence of oral disease in children with special needs, as well as a high level of dental treatments not performed among this group, which is why the role of the dentist for the diagnosis and early treatment of these conditions is paramount. Therefore, oral health promotion and education programs are necessary, as is providing access to quality dental care.

## 152. DOES THE *gtf-B* GENE OF *STREPTOCOCCUS MUTANS* INFLUENCE CHILDHOOD CARIES?

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**Introduction and objectives:** Caries is a universally distributed and multifactorial oral disease, *Streptococcus mutans* being the most commonly isolated bacterial agent. Three types of glucosyltransferase (GTF), *gtf-B*, *gtf-C* and *gtf-D* have been recognized, which are involved in the process of sucrose-dependent adhesion of *S. mutans* to tooth surfaces.

The aim of the study was to determine if the variability of the *gtf-B* gene of the *Streptococcus mutans* strains correlates with the deft and DMFT indices in children.

**Methods:** The study population consisted of children (n = 44) of both sexes of 6-8 years of age. A dental clinical examination was performed. Stimulated saliva samples were cultured in Mitis Salivarius Agar for the growth of *S. mutans*. Bacterial colonies were recovered in a brain heart infusion and incubated for 48 hours. DNA extraction was performed according to the Bollet method. The virulence gene *gtf-B* was amplified by PCR and sequenced. The haplotypes of the *gtf-B* gene were identified with the DNAsp program and their genealogical relationships were established with the Median-joining network using the PopART program. To correlate the genetic variants and caries experience, the Spearman analysis was applied using the PAST program. This study is part of a research project approved by the Ethics Committee of the Faculty of Dentistry (NUC) and has no conflict of interest.

**Results:** Mean values of deft were obtained:  $4.02 \pm 3.4$ ; DMFT:  $0.75 \pm 1.43$  and DEFT + DMFT:  $4.77 \pm 4.2$ . We identified 22 haplotypes in the *gtf-B* gene, 2 being the most common (shared by the strains of 12 children). The haplotype network revealed little genetic differentiation and all were part of a clonal complex. The correlations between the haplotypes of the virulence gene *gtf-B* with the deft indices ( $r = 0.242$ ,  $p = 0.11$ ), DMFT ( $r = -0.0094$ ,  $p = 0.95$ ) and deft + DMFT ( $r = 0.198$ ;  $p = 0.197$ ) were not statistically significant.

**Conclusions:** There was no evidence of a relationship between the variants of the *gtf-B* gene of the *S. mutans* strains isolated in the children studied and their experience of caries.

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## 156. STUDY OF THE ESTHETIC PERCEPTION OF FACIAL ASYMMETRY AND POSTERIOR CROSSBITE

Brito, M.; Vicente, A.; Pérez, A.; Serna, C.; Ortiz, A.J. University of Murcia. Murcia

**Introduction and objective:** Previous studies have evaluated the esthetic perception of facial asymmetry and the presence of posterior crossbite by orthodontists. However, there are few studies in which the evaluators are pediatric dentists. Our objective was to evaluate the perception of the asymmetry of the lower facial third due to the deviation of the chin and posterior crossbite by: patients, parents and pediatric dentists.

**Methods:** Using Adobe Photoshop Software CS6®, two photographs were modified, one extraoral and one intraoral, of a 14-year-old adolescent with facial symmetry and optimal occlusion. From the extraoral photography, an asymmetry of the lower facial third was simulated by deviation of the chin

of 2 mm and 4 mm and with intraoral photography a posterior crossbite of 2 mm and 4 mm. Three groups of evaluators (n = 40): patients (10-15 years), parents (35-45 years) and pediatric dentists (35-45 years), assessed the original and digitally modified images, rating them from 0-10, with 0 being the least esthetic score and 10 the most esthetic. The data was analyzed with the Kruskal-Wallis test ( $p < 0.05$ ) and the Mann-Whitney test (Bonferroni correction  $p < 0.017$ ).

**Results:** Both the group of patients and that of the parents did not detect significant differences ( $p > 0.017$ ) between the photograph with 2 mm deviation of the chin and the original without deviation. However, pediatric dentists rated as significantly less esthetic ( $p < 0.017$ ) the photo with a 2 mm deviation than the photo without deviation. The three groups of evaluators considered the photo with a 4 mm chin deviation as significantly less esthetic than the rest of the photographs ( $p < 0.017$ ). The three groups rated the photograph with the posterior crossbite of 4 mm as significantly less esthetic ( $p < 0.017$ ) than the photo with 2 mm and the original photo. In addition, the photo with 2 mm posterior crossbite was considered by the three groups as significantly less esthetic ( $p < 0.017$ ) than the original.

**Conclusions:**

1. The asymmetry of the lower facial third due to the deviation of the chin of 2mm was perceived only by pediatric dentists. However, all groups perceived the deviations of 4 mm.
2. The presence of posterior crossbite of 2 mm and 4 mm was perceived by all the groups of evaluators.

### 159. ROTARY AND CONVENTIONAL TECHNIQUES FOR PULPECTOMIES. LONG TERM FOLLOW-UP

**Mosquera, M.; Paredes, A.; Riobos, M.F.; Reyes, A.; Costa, F.**

*Alfonso X El Sabio University. Madrid*

**Introduction and objectives:** One of the most critical phases for the success of root canal treatment in the primary dentition (pulpectomy) is the complete removal of organic detritus through instrumentation. The success of root canal treatment is through a correct diagnosis, access, cleaning and conformation, and correct three-dimensional filling. The complex morphology of the root canals in the deciduous dentition should be taken into account and the behavior of the child patient, which requires techniques to facilitate the procedure. The preparation of the root canal can be done with manual or mechanical instrumentation (rotary, ultrasonic). The advantages of rotary over manual instrumentation is the reduction of working time, greater efficiency in the cleaning of the root canal, as well as the conformation of a more cone shaped canal. The design and flexibility of NiTi instruments allows preserving the original configuration of curved root canals with their thin walls that are typical of primary molars, while reducing errors in the procedure. The objective of this work

was to compare manual versus rotary instrumentation in pulpectomy instrumentation in the primary dentition, by means of control radiography.

**Methods:** A comparison was made using the case studies of child patients and primary molars that analyzed: age, sex, type of instrumentation (rotary or manual), tooth treated, extravasation of the material, and the presence or not of material reabsorption. In the manual instrumentation sequential Ni-Ti files were used, while in the rotary instrumentation Reciproc Blue files with a reciprocal single file system were used.

**Results:** The variables studied were analyzed to obtain conclusions on which technique is more effective, and if there is a relationship between survival in time of the primary molar and the technique used for instrumentation of the root canal.

**Conclusions:** Modern rotary instruments allow reducing preparation time, leaving more time for irrigation. The new technologies applied in pediatric dentistry related to rotary instrumentation are very advantageous for dentists as working time is reduced and there is greater efficiency when performing the treatment.

### 168. THE DOPPLER: AN EFFICIENT DIAGNOSTIC METHOD FOR EXAMINING THE TEMPOROMANDIBULAR JOINT OF A CHILD

**Alsafadi, A.; Álvarez, C.; González Chamorro, E.; Cobo, T.**

*University of Oviedo. Dental Institute. Oviedo*

**Introduction and objectives:** Temporomandibular joint dysfunction (TMD) is a common condition in adulthood, however, the symptoms are increasing in children and adolescents. The functional disorders of the stomatognathic system that are typical of this disease can be present in children in the primary and mixed dentition almost in the same proportion as in the adult population. The objective of this study was to demonstrate the efficacy of the Doppler for the diagnosis of TMD.

**Methods:** We selected 20 patients, 13 girls and 7 boys, aged between 8 and 14 years. A clinical history and extraoral examination were performed to confirm the presence of signs and symptoms of TMD. The ultrasound examination was performed with a LOGIQ ultrasound device from BT12-GE Healthcare®. All patients were examined in the supine position and with adequate lighting. The probe was placed on the TMJ area, perpendicular to the zygomatic arch, in the transverse and longitudinal planes, and manipulated until the best visualization was achieved.

**Results:** High resolution ultrasound allowed identifying the condyle very well, the joint disc, the eminence and the glenoid fossa. In our study, 15 patients did not have clicking (75%), but in two patients this was bilateral (10%) and in 3 patients unilateral (15%). In relation to joint effusion, 17 (85%) patients showed no effusion, in one (5%) patient it was bilateral, and in 2 (10%) patients unilateral. Regarding



condylar wear, 20 (100%) patients did not have any type of wearing of the condyle. The Doppler was effective for identifying the normal joint, the anterior displacements of the disc with and without reduction, joint effusion and erosion of the condyle in both adults and children.

**Conclusions:** High resolution ultrasound is an effective diagnostic method when it is accompanied by extraoral examination and a questionnaire for the patient to confirm the disease. It can complement the clinical evaluation of the temporomandibular joint in adult patients, in patients who are growing and in patients with syndromes such as Treacher Collins, hemifacial microsomia, etc. The Doppler can be used as a diagnostic tool to identify the condition and diseases of the temporomandibular joint. It is a non-invasive technique, with no radiation exposure, it is easy to use and it provides important information on the clinical status of the temporomandibular joint.

## 222. ANALYSIS OF CARIES RISK IN A CHILD POPULATION AND THE RELATIONSHIP WITH CARIOGENIC DIET

**Mateos, M.V.; Bratos, E.; Lenguas, A.L.; López, A.J.; Valdepeñas, J.; Garcillán, M.R.**

*Complutense University of Madrid. Madrid*

**Introduction and objectives:** Today caries is defined as “sugar dysbiosis”: the frequent consumption of fermentable carbohydrates and its metabolism by acid-tolerant germs leads to a dysbiosis in the biofilm, favoring the development and growth of acidogenic and aciduric germs, therefore, cariogenic germs. It has been widely demonstrated that without sugar there are no caries. To minimize the risk of caries throughout life, you must avoid the development of the disease in childhood, so the intake of free sugars should be the lowest possible at this stage. The objectives of the work were to find out in a child population the global risk of suffering from caries, and to identify which risk factors are the most prevalent in the high risk group, and if the consumption of sugars is present in a significant way in this group.

**Methods:** This was a descriptive study. The sample was composed of 548 patients aged 6 to 14 years attended in the Faculty of Dentistry of the Complutense University of Madrid on the course Preventive and Community Dentistry. The risk of caries was assessed individually using the CAMBRA (Caries Management by Risk Assessment) protocol. The variables analyzed were risk factors and indicators of disease.

**Results:** 40.5% of patients presented a high risk of caries. The most prevalent risk factor was the presence of plaque, the plaque index being 58.2% on average, followed by the presence of deep pits and fissures in 41% and the consumption of sugars between meals by 36%. The indicators of disease that we detected were the presence of visible caries in 43.3%, interproximal carious lesions diagnosed by radiography in 21.6%, demineralization lesions in 48.2% and restorations in the last three years in 55%.

**Conclusions:** A high percentage of patients had a high risk of caries and the consumption of sugars was present to a large extent in this group. It is essential to identify risk factors to be able to treat caries disease, with diet control being a very important factor and preventive dental protocols should emphasize this more. The new approach should be aimed at restoring the ecological balance of dental plaque, and at avoiding as far as possible the dysbiosis caused by sugars.

## 234. FROM SCHOOL TO THE DENTIST. A PILOT EXPERIMENT

**Miñarro, M.J.; Albares, M.; Mora, G.; Berriatua, M.**  
*Orodental Health Unit Sierra de Guadarrama. Madrid*

**Introduction and objectives:** The Oral Health Unit of Sierra de Guadarrama is located in the vicinity of a school with a child population that has this unit as their reference. Last year, the Primary Care Department promoted the need to expand the cover of Service 107 related to oral health care for children. The members of the Unit developed a project called *DEL COLE AL DENTISTA* (from school to the dentist) that includes:

1. Community intervention among the group of parents of the courses selected to participate in the pilot project.
2. A Specific Health Education Project for first year primary school children.
3. Following parental consent, a visit by students to the Unit that includes an oral examination according to the WHO recommendations.
4. Evaluation of the impact of this project on cover by the Unit.

The main objectives of this project are:

1. Provide the child with their first dental experience.
2. Give continuity during the First Year to the oral health education project started during the infant stage.
3. Increase patient recruitment and cover for Service 107.

**Methodology:** The usual protocols for evaluation of community interventions and health education project were applied. The caries indexes and risk factors in the child population examined were evaluated, and the impact on the cover of the child oral care service was calculated.

**Results:** A total of 39 primary school students were examined: 18 were first visits, 17 revisions and 3 were late re-inclusions into the oral health program. 22 children were called and treated. Only 3 children were free of cavities in both the primary and permanent dentition. The majority were of immigrant origin, second generation, and of medium-low socioeconomic level. There was little loyalty among children to the current oral health program.

**Conclusions:** Given the results, it was concluded that incorporating the rest of the school stage into the project was necessary in order to improve child and adolescent oral health and extend the project.

## SYSTEMATIC REVIEW OF THE LITERATURE

### 4. RESISTANCE TO FATIGUE, FLEXION AND ABRASION OF COMPOSITES COMPARED WITH GLASS IONOMERS AS PERMANENT RESTORATION MATERIALS. A SYSTEMATIC REVIEW

**Panizo, A.; Martínez, E.; Ortiz, A.**

*Faculty of Dentistry. University of Murcia. Murcia*

*Introduction and justification:* Currently, the planning of pediatric dentistry is based on caries risk, following protocols based on the principles of Minimally Invasive Dentistry (MID). In children, it is not always possible to place composites in conditions of complete isolation and we use glass ionomer as the final filling material in atraumatic restorative treatment (ART) techniques. Through this systematic review we intended to find out if ionomers are suitable for replacing composites, based on the properties of resistance to fatigue, flexion and abrasion, which are fundamental for the retention of a definitive restoration over time.

*Methodology of the review:* We conducted this systematic review based on the PRISMA system (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). We excluded: animal studies, clinical cases, pilot studies, editorials, letters, systematic reviews, *in vivo* studies and end-of-degree projects. We included *in vitro* studies that analyzed the resistance to fatigue, flexion and abrasion of glass ionomers compared to composites. The databases used were: PubMed Central, PubMed, Embase, Web of Science, Cochrane Library, Science Direct and Science Database (Proquest). The search period was established between January 1994 and November 2017. The keywords were: “Resistance composites and glass ionomers”.

*Results and discussion:* The search strategy led to 317 articles, of which, only ten met the inclusion criteria. When using the quality scale designed by the authors of this review, the ten articles were considered to be high quality. From the results it should be highlighted that the ionomers introduced into certain solutions had better property retention, and some authors coined the term “recovery capacity”, that is they could reach a “stationary” state after more than 24 hours in damp environments. The ionomers subjected to forces had lower values with regard to fatigue limit when flexed compared with the composites.

*Conclusions:* The composites showed a greater *resistance to fatigue* than the ionomers. The ionomers in humid environments have a capacity of “*regeneration*”, increasing their properties. The *mechanical manipulation* of the ionomers compared with manual manipulation, improves their resistance. A single resistance test of ionomers and/or composites does not prove their behavior.

### 16. RELATIONSHIP BETWEEN FACIAL GROWTH PATTERNS AND SKELETAL AND DENTAL MATURATION IN GROWING PATIENTS

**Vilar, C.; Méndez, M.; Torres, L.; Bartolomé, B.**

*European University of Madrid. Madrid*

*Introduction and justification:* One of the main characteristics of pediatric dentistry patients is that they are constantly changing and growing. However, this evolutionary process is not constant and it is different in each individual, so there is not always consistency between the chronological age of a patient and their physiological age. The child, during development and growth, goes through different phases, some of which are more favorable for treating certain dentofacial conditions, so evaluating the maturation stage, both skeletal and dental, is decisive when planning pediatric dentistry and orthodontic treatment. Several studies have found a relationship between the periods of dental and skeletal maturation and facial growth patterns. This relationship would provide dentists with additional information to be able to anticipate the speed of maturation that the child is going to have, and thus plan the most appropriate treatment for each individual.

*Methodology of the review:* A literature search was performed in PubMed, Ebsco and Google Scholar databases. The keywords used were: “facial growth pattern”, “dental maturation”, “skeletal maturation”. The inclusion criteria were: articles published in the last 10 years, in English or Spanish.

*Results and discussion:* There were differences between the results obtained in the studies published in recent years, which may be due to the variability of the methods used when assessing both facial patterns and skeletal and dental maturation patterns. Most articles found that those with a vertical growth pattern tended to more advanced dental maturity compared to subjects with a horizontal growth pattern. With regard to skeletal maturation, the authors agree that individuals with a vertical growth pattern also have more advanced bone maturation compared to individuals with a horizontal growth pattern.

*Conclusions:* The study of facial growth patterns can help dentists formulate a better treatment plan from the point of view of both pediatric dentistry and orthodontics, as information on the most suitable time for performing certain dentofacial corrections can be provided.

### 52. AURICULOTHERAPY AND PEDIATRIC DENTISTRY

**Lapitskaya, A.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Conde, S.<sup>1</sup>; Hernández, M.<sup>1</sup>; Ping, L.<sup>2</sup>**

*<sup>1</sup>University of Barcelona. Barcelona. <sup>2</sup>International School of CTM. Barcelona*

*Introduction and justification:* Acupuncture is a Traditional Chinese Medicine practice that involves the introduction of

fine needles into certain points of the human body to relieve pain, anesthetize certain areas and cure certain diseases. Auriculotherapy is the technique of stimulating specific points of the ear with magnets, seeds, needles. The objective of this literature review was to provide a global view of the technique and its application in pediatric dentistry.

*Methodology of the review:* Review of the scientific literature in Spanish through the PubMed and Cochrane search engines, and completing the review by reading the different publications in the ScienceDirect.com website.

*Results and discussion:* A total of 8 selected studies was obtained: Auriculotherapy can be indicated for the treatment and management of certain health conditions, such as: acute and chronic dental pain, anxiety and dental stress, trigeminal neuralgia, nausea and vomiting, giving patients the possibility to feel more comfortable and relaxed. The technique is based on the somatotropic organization of the ear that reproduces the entire human body in the outer ear - as if the ear was an inverted fetus - and which allows access to the different body areas because each point of the body corresponds with an area of the ear. The points used the most are 4: Shen Men Point, Dental Anesthesia Point, Mouth Point and Stomach Point 6.

*Conclusions:* Auriculotherapy can be used successfully to treat pediatric dentistry patients when the use of analgesics, anti-inflammatory drugs or anesthetics is not really indicated, as it is a less aggressive alternative for children and it has beneficial results for controlling nausea and various conditions of the oral-maxillofacial complex, such as TMJ dysfunctions, odontalgia, dental treatment anxiety, as well for treating bad habits that affect children and adolescents.

#### 104. UPDATE ON THE MANAGEMENT OF CHILD BRUXISM

**Enrech, J.; Gracias, I.**

*Private Practice. Madrid*

*Introduction and justification:* Bruxism is a non-functional oral motor activity characterized by involuntary, rhythmic or spasmodic grinding of the teeth, regulated by the central nervous system and influenced by peripheral psychosocial and postural factors. The etiology is multifactorial. The prevalence of bruxism in children varies from 3.5% to 40.6% and decreases with age. Bruxism can cause dental wear, orofacial pain, headaches and sleep, respiratory and behavioral disorders. The aim of this review was to update the concepts on this pathology and alert health professionals to its early detection and management.

*Methodology of the review:* Systematic review of the literature published after 2015 in medical and dental scientific journals with high impact, in the databases of: PubMed, Medline, Cochrane, Scielo.

*Results and discussion:* The most complete diagnosis of bruxism includes, in addition to grinding and the clinical characteristics compatible with bruxism, a polysomnography and

audio/ video recordings during sleep. In children, the most reliable method is the testimony of their parents. Before planning the treatment, we should take into account the physiological attrition of the primary teeth between the ages of 3-5 years for the correct development of the jaws, and that the prevalence of bruxism decreases with age. This allows clinicians to adopt a non-interventionist approach. Bruxism should be treated when there are signs and symptoms such as temporomandibular disorders, pain and limited mouth opening. There are different therapeutic modalities for child bruxism: dental treatment using occlusal devices during sleep to reduce muscular hyperactivity and protect the teeth; psychological therapies to achieve changes in habits and reduce stress; pharmacological treatment to improve anxiety levels; surgery to correct respiratory obstructions, and physiotherapy to for postural improvement.

*Conclusions:* Existing knowledge on the prevalence, etiology, consequences and diagnosis of bruxism was reviewed. Most cases of bruxism in pediatrics require observational behavior, monitoring together with periodic dental control. However, if comorbidities also manifest, intervention for therapeutic purposes is recommended. The management of bruxism was evaluated with dental, pharmacological and psychological strategies. Currently, there is no effective treatment to cure bruxism permanently. A combination of different strategies can be justified to protect the teeth and relieve pain. More studies are needed on treating bruxism in children.

#### 144. COMPARISON OF THE DEGREE OF MICROFILTRATION OF A SEALANT APPLIED WITH CONVENTIONAL TECHNIQUE OR WITH ADHESIVE. A REVIEW OF THE LITERATURE

**Wu, T.Y.; Traver, C.; Marín, F.; Ruiz, A.; Manfredi, G.**

*Catholic University of Valencia. Valencia*

*Introduction and justification:* Tooth decay in children continues to be one of the most common diseases, and is the cause of dental mutilation and the resulting sequelae. Grooves, pits and fissures are areas with a morphology that favors plaque retention. Taking more effective measures specifically aimed at protecting pits and fissures, by using pit and fissure sealants is necessary. The objective of this study was to evaluate if the application of an adhesive (conventional or self-etching) improves the effectiveness of a sealant.

*Methodology of the review:* Articles were selected that evaluated the retention and micro-filtration of sealants according to the conventional, adhesive and self-etch techniques. The keywords chosen were: “dental sealants”, “adhesives”, “self-etch adhesives”, “microleakage”, “retention”, and “conventional technique”. We included articles published in the last 10 years, in English and Spanish, with access to the full text, in vitro and in vivo studies. The exclusion criteria were articles published before 2009 and studies carried out on animals. The search was made in the databases of PubMed and EBSCO.

*Results and discussion:* According to the articles reviewed, it cannot be claimed that there is a significant difference in micro-filtration between dental sealants applied with the conventional technique or with adhesives. However, some *in vitro* studies obtained significantly better results in the infiltration of fissures and prevention of micro-filtration by using an adhesive agent.

*Conclusions:* There is controversy in the results. Some *in vitro* studies have significant results, but other authors claim that there is no difference between the conventional technique and the application of adhesive. Therefore, to reach a definite conclusion it is necessary to perform longitudinal studies *in vivo* in a heterogeneous population with a larger sample size.

### 179. THE USE OF CONE BEAM COMPUTED TOMOGRAPHY IN PEDIATRIC DENTISTRY

**Gómez, E.; Lluch, C.; Acosta, J.; Guinot, F.**  
*International University of Catalonia. Barcelona*

*Introduction and justification:* The use of cone beam computed tomography (CBCT, Cone Beam Computed Tomography) allows the diagnosis and treatment of common diseases in pediatric dentistry to be made accurately. This technique emits a greater dose of radiation than conventional radiology, which is why pediatric dentists must weigh the risk-benefit ratio of CBCT and adjust the field of vision. The reason for this review was to discover the main indications and contraindications of CBCT in pediatric dentistry.

*Methodology of the review:* A literature search was performed in the Medline database, via PubMed using the search terms “CBCT pediatric dentistry”, obtaining a total of 182 articles. The articles related to pediatric dentistry were included and the exclusion criteria were articles prior to 2017, articles related to orthodontics and growth and *in vitro* studies. After applying the inclusion and exclusion criteria, a total of 13 articles were obtained.

*Results and discussion:* There are clinical situations in which the use of CBCT in pediatric dentistry is indicated, however in others there is no relevant information, and its use is therefore not justified. In cases of impacted supernumerary teeth, the use of CBCT is justified, since there is a risk of damaging surrounding structures during their extraction. For example, in the case of a mesiodens, knowing the three-dimensional position would help prevent complications associated with the eruption of the incisor. For the diagnosis of root fractures it is more effective than conventional radiology and it is also a more precise technique for diagnosing inclined internal root resorption. With CBCT we can assess the different degrees of ossification and morphology of the mid-palatal suture. It is also useful for assessing with much more precision cases of regional odontodysplasia, as well as the teeth that are in the split of a cleft palate, and for determining root development in autotransplantation, for confirming

apical closure, among other situations. CBCT is not indicated for the diagnosis of pre-eruptive intracoronary reabsorption, neither for the detection of dental caries, nor for root fractures if the roots have endodontic treatment or metallic poles, in which case, the presence of these elements makes CBCT inaccurate.

*Conclusions:* CBCT is a very useful diagnostic tool, and pediatric dentists should be familiar with the indications and contraindications.

### 185. THE 5 ELEMENTS AND FLAVORS IN PEDIATRIC TRADITIONAL CHINESE MEDICINE

**Carrillo, A.<sup>1</sup>; Conde, S.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Hernández, M.<sup>1</sup>; Ping, L.<sup>2</sup>**

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*Introduction and justification:* Traditional Chinese medicine considers that the flavor of foods exerts a stimulating action on the organism. Each element is represented by organs of the body and these in turn are stimulated with certain flavors that can regulate their physiological functions. The theory of the five elements tells us that everything that happens in the Universe is related to the elements wood, fire, earth, metal and water. The aim of this work was to extrapolate how the five elements influence or relate to the five flavors: acid, bitter, sweet, spicy and salty.

*Methodology of the review:* A literature review of the relationship between the five elements and flavors has been made, in search engines such as PubMed, Cochrane and in books. The keywords were “Chinese traditional medicine”, “five elements”, “flavors” and “pediatric dentistry”.

*Results and discussion:* 26 articles were found and, after eliminating those that were not of interest, five articles were included in the review. A certain flavor corresponds to each element. The element Wood is related to an acid flavor, Fire to a bitter flavor, Earth to a sweet flavor, Metal to a spicy flavor and Water to a salty flavor. The flavors act on the elements according to the laws of generating and controlling (Sheng-Ke). Apart from the creative cycle (Sheng), there must be a control cycle to avoid the excess of an element. An excess or lack of flavor leads to the appearance of diseases and disorders in the organs related to that flavor and element.

*Conclusions:* It is important to take into account the relationship between the five elements and the flavors, since a positive or negative tropism due to a flavor can indicate the presence of problems in the organ associated with its element, or it can damage it through the excess or lack of that flavor. It is necessary to give importance to a balanced diet to avoid an imbalance of the elements and the appearance of diseases. In pediatric dentistry, the sweet taste is of interest, since its excess leads to a disturbance of the body's salts and, according to the theory of the 5 elements, caries.



## 200. ACUPUNCTURE AND PROBLEMS WITH THE TMJ IN PEDIATRIC PATIENTS

Villanueva, I.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Conde, S.<sup>1</sup>; Espasa, E.<sup>1</sup>; Ping, L.<sup>2</sup>  
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*Introduction:* Traditional Chinese Medicine can complement traditional medicine and/or provide an alternative. Acupuncture is the insertion of a needle into the body for the purpose of normalizing physiology, prevent disease or maintaining health. In dentistry it is used to treat a series of diseases and to treat temporomandibular joint dysfunctions. With regard to pediatric patients it has been suggested that acupuncture has the potential to be a non-pharmacological therapeutic option for the management of acute pain.

*Objective:* To carry out a literature review on temporomandibular dysfunctions and its treatment with acupuncture in the pediatric patient.

*Methodology:* A review of books and documents of scientific societies related to acupuncture was carried out, and an electronic search in the Medline/PubMed database with the keywords "acupuncture" "pediatric" "temporomandibular disorder".

*Results and discussion:* After the initial search, 21 articles were selected, of which 8 were excluded because they were considered irrelevant for the purpose of this review and 13 were included. According to the studies reviewed, acupuncture stimulates the patient's own organism to react, producing the desired effect, such as for example, a relaxing or analgesic effect. In patients with temporomandibular dysfunctions, the points used in acupuncture are the SI19 Palace of Hearing, GB21 Shoulder Well and TE17 Wind Screen. With the stimulation of these points, pain is reduced in a short space of time and mandibular movement improves. Oral opening is increased and the signs and symptoms of myofascial pain in temporomandibular disorders are relieved. It is more beneficial for the patient when their state of health is deteriorated by associated diseases that are severe, and it can be applied in pediatric patients with intolerance to certain analgesic drugs, or who suffer frequent anaphylactic reactions.

*Conclusions:* There is solid evidence on the safety and viability of acupuncture and its therapies in children and adolescents, but more studies are needed to treat specific conditions. The evidence regarding acupuncture as symptomatic therapy for the treatment of temporomandibular disorders is limited, and more rigorous studies are required, especially in the field of pediatric dentistry.

## 204. ECTOPIC ERUPTION OF THE FIRST PERMANENT MOLARS. TREATMENT OPTIONS

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*Introduction and justification:* The ectopic eruption of the first permanent molars in children during the eruption process

is a relatively common finding in daily clinical practice and raises several complications. A short arch, or first permanent molars of a large size, or a more pronounced mesial angle of eruption, can result in molar impaction. With this review of the literature, our aim was to present the different treatments that can be performed to resolve ectopic eruptions.

*Methodology of the review:* A review of the literature was performed in PubMed and Google Scholar databases with the keywords: "first permanent molar", "ectopic eruption", "management", "treatment". The inclusion criteria were: articles published in the last 20 years and articles in English. The exclusion criteria were: articles beyond 20 years and those published in languages other than English. Seven articles that met the inclusion criteria were selected.

*Results and discussion:* Among the treatments suggested for straightening first molars that erupt ectopically are: The fitting of a separation elastic or a brass wire between the second primary molar and the first permanent molar, the placement of an orthodontic appliance for straightening the molars, a surgical approach to the first permanent molar, the extraction of the primary tooth and the fitting of an orthodontic appliance for recovering the space such as a Hilgers pendulum, following the mesial eruption of the first molar.

*Conclusions:* Despite studies that show that a considerable percentage of ectopic eruptions of molars are spontaneously corrected, there are different ways to treat this eruption once detected according to its severity. Dealing with the impacted tooth as soon as possible is recommended, at least in a non-invasive way. The recovery of space by molar straightening using orthodontic appliances is easier in the upper arch than in the lower arch. Therefore, it is very important to correct these ectopic eruptions in both arches, and even more so in the lower one.

## 205. THE DIFFERENT FLAVORS AND AREAS OF THE TONGUE IN PEDIATRIC TRADITIONAL CHINESE MEDICINE

Moreno, F.<sup>1</sup>; Conde, S.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Espasa, E.<sup>1</sup>; Ping, L.<sup>2</sup>  
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*Introduction:* The examination of the tongue is one of the basic foundations of the diagnosis of Traditional Chinese Medicine (TCM). It is based on the observation of four main points: color, shape, coating and moisture. According to TCM, the five flavors, bitter, acid, spicy, sweet and salty, are associated with different areas of the tongue, and in turn, these are related to the five elements and different organs of the body. When an organ does not work properly, the tongue will exhibit this in its color and texture.

*Objective:* The present study aims to analyze using the literature, the association that exists between the different areas of the tongue and the five flavors and organs of the body.

*Methodology:* A systematic review was made in the databases of: PubMed, Scielo and Medline, as well as a search

of TCM books, using the following keywords: tongue, five flavors, Chinese Medicine.

*Results and discussion:* After the initial search, 12 articles were selected, of which 5 were included in this literature review, as well as a book on TCM. The tip of the tongue is associated with the fire element, the heart with a bitter taste; the edges are associated with wood, liver, gall bladder with an acid taste. Behind the tip with metal, the lungs with a spicy flavor; the middle area with the earth element, spleen, stomach with a sweet taste; and the base with water, the kidneys with a salty taste.

A pink and even-looking tongue indicates a good state of health, good digestion and a proper diet. Well-balanced people who understand their emotions tend to have this color. The degree of moisture indicates the state of the liquids of the organs, and the coating is indicative of a lack of hygiene, digestive disorders or candidiasis.

*Conclusions:* The tongue recognizes flavors and these have a predilection for a certain area. Also, positive or negative tropism for any of the five flavors can generate a disease in the organs that are associated with these. Therefore, through the observation and diagnosis of the tongue we can detect early on, the diseases present in the different organs of our body. It is important, from the dietary point of view, to harmonize the five flavors, and also the different natures of food (cold, hot, neutral and warm), in order not to unbalance the organism.

## 207. DENTAL FLUOROSIS

**González, N.; Veloso, A.; Vilella, S.; Yuste, S.; Lluc, C.; Guinot, F.**

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*Introduction and justification:* Dental fluorosis is an irreversible structural anomaly that occurs in the enamel of permanent teeth as a result, and among other conditioning factors, of the daily intake of water with high fluoride content during the first ten years of life approximately. This exists in the waters of rivers, seas, deep wells and groundwater. Dental fluorosis has been considered an endemic epidemiological disease that has affected thousands of people in a country or region over the years. The differential diagnosis is obtained, mainly, through the patient's medical history and residence.

*Methodology of the review:* A systematic review was carried out with the following keywords: "fluorosis", "fluorosis dental", "fluor". The search using "fluorosis" in ScienceDirect yielded 5,457 articles, in Cochrane 6 reviews and 82 trials, in Scielo 237 articles, in Google Scholar 61,700 articles and the Ministry of Health and Consumer Affairs of the Government of the Canary Islands. A total of 19 articles directly related to dental fluorosis and published between 2009 and 2019 in Spain and preferably in Spanish were selected. They were grouped according to etiology, diagnosis, influence of the environment and habits, and forms of fluoride presentation.

*Results and discussion:* The consumption of fluoridated water, and the different products and forms of presentation and application of fluoride, directly influence the development of fluorosis. This also manifests clinically with different specks and spots, typical of fluorosis, which is classified into different degrees and subtypes. The correct and timely diagnosis of fluorosis and its clinical manifestations are fundamental. This enables the modification of water consumption habits and other products with added fluoride, and will avoid or reduce the appearance of fluorosis in children.

*Conclusions:*

1. Fluorosis can be prevented by being aware of the systemic effect of fluoride and how it interferes in the development of the enamel according to the different forms of presentation in which this component is found.
2. A correct follow-up of a child's medical history and residence, taking into account dietary habits and oral hygiene, can be crucial to minimize the effects of fluoride on the development of the enamel defect.

## 212. NITROUS OXIDE AS A BEHAVIOR MANAGEMENT TECHNIQUE IN PEDIATRIC DENTISTRY

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*Master's degree in Pediatric Dentistry. Dental clinic. University of Valencia. Valencia*

*Introduction and justification:* Conscious sedation with nitrous oxide/ oxygen is a safe and effective behavior management technique that decreases a patient's anxiety, thus encouraging their cooperation. These features mean that there is increased interest in its use given the concerns of parents for their children's dental experiences not to be "traumatic". The objective of this work was to carry out a literature review to find out the clinical effects of nitrous oxide in pediatric dentistry patients.

*Methodology of the review:* A search was made in PubMed, Google Scholar, Embase and Cochrane databases. We included clinical studies that used only nitrous oxide as a sedative agent during dental treatment in pediatric patients.

*Results and discussion:* Most authors concluded that nitrous oxide produced a decrease in stress and anxiety. An improvement in behavior and tolerance of the dental procedure was also described in many studies. The incidence of adverse effects was low, the most frequent being headaches, nausea and vomiting. In the studies analyzed there was no unanimity regarding the need to avoid food and drink before the procedure. The usual concentration of NO<sub>2</sub> to obtain the desired effects ranged from 30-40% among the different authors. The great variety of tests used to evaluate the physiological effects, anxiety and the behavior of the children in the different studies should be highlighted.

*Conclusions:* The authors emphasized that although there are beneficial effects of nitrous oxide in the behavior management of pediatric patients, this cannot be achieved without the use of other basic behavior modification techniques. For practical purposes it is advisable that future research unifies criteria and methods for greater direct clinical application.

## 217. RELATIONSHIP BETWEEN THE “ORGANS” AND “MOUTH-TONGUE-LIPS”

**Morera, J.<sup>1</sup>; Conde, S.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Hernández, M.<sup>1</sup>; Ping, L.<sup>2</sup>**

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*Introduction and justification:* Traditional Chinese medicine (TCM) considers the individual as a balanced unit in which each tissue, organ, apparatus and system is related to each other, and that a disturbance of one of them will cause a reaction in the individual. TCM is based on the theory of the Five Elements: Fire, Earth, Metal, Water and Wood, which are related to the different organs and structures of the body. The aim of this study was to interrelate the mouth, lips and the tongue with their respective organs.

*Methodology of the review:* A literature review was performed using the electronic databases; PubMed and Cochrane Oral Health Group's Trials Register and Medline, using keywords as a search engine; “Traditional Chinese medicine”, “Ying-Yang” and “Qi”.

*Results:* From the search 12 articles were found, of which 3 were taken into account due to the inclusion criteria. The mouth and the lips are related to the spleen, since food enters through here that later will be processed by the spleen. When the mouth is dry or there is a disorder of taste, this reflects a deficiency of “Qi” (vital energy) of the spleen. Rosy and moist lips indicate a properly functioning spleen, and dry and cracked lips would indicate problems with the metabolism of fluids. Lips that are too dry and red indicate digestive problems. The tongue has a direct or indirect relationship with almost all the organs of our body. CTM considers it the mirror of the heart. A tongue with a pink or pale red appearance reflects that the organ is functioning correctly. On the other hand, a pale tongue would indicate heart problems.

*Conclusions:* From the articles read, the literature shows that there is a spleen-lips, spleen-mouth and heart-tongue relationship. For this reason, the health of the mouth depends on the health of the entire organism. Due to this interrelation, the patient should be treated as a whole, establishing a clear global picture of the person, and an effective and personalized treatment can then be provided.

## 218. ACUPUNCTURE FOR CONTROLLING NAUSEA AND VOMITING

**Delgado, R.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Conde, S.<sup>1</sup>; Hernández, M.<sup>1</sup>; Ping, L.<sup>2</sup>**

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*Introduction and justification:* Acupuncture is treatment within Traditional Chinese Medicine, in which needles are inserted or not into energy points, located externally, that connect with different internal organs through paths that are called meridians. If the meridian that connects with the organ that is affected is known, the point can be stimulated with the insertion of needles. Currently it is widely applied in different work areas, including dentistry. The objective of this review was to determine the effectiveness of the use of Acupuncture point therapy to control nausea and vomiting in pediatric patients.

*Methodology of the review:* A systematic review of the literature was performed in the PubMed and Cochrane databases, using the key words “acupuncture”, “nausea and vomiting”.

*Results and discussion:* Nausea is the subjective, unpleasant, non-painful sensation of vomiting. Vomiting is an expulsion of gastric contents through the mouth, as a result of strong contractions of the abdominal and thoracic muscles. For controlling nausea and vomiting there are 3 acupuncture points involving the stomach: PC6 “Internal barrier”, is located on the anterior side of the forearm and its target area is the stomach, thorax and uterus; S24 “Slippery Flesh Gate”, located above the navel and its target area is the stomach; and the GB34 “Yang mound spring”, located on the external and lateral part of the leg and its target area is in the legs and tendons.

*Conclusions:* The first point PC6 is easier to access for use in clinical practice with pediatric patients. Although its effectiveness is proven and it is considered a simple and safe method, more studies are needed to validate it as a clear option for traditional pharmacological treatment. The information is still very limited, and there are no studies with high evidence to support this therapy for managing this manifestation and other dental phobias.

## 225. ACUPUNCTURE FOR TREATING ANXIETY IN PEDIATRIC DENTISTRY

**Cámara, A.<sup>1</sup>; Conde, S.<sup>1</sup>; Boj, J.R.<sup>1</sup>; González, P.<sup>1</sup>; Ping, L.<sup>2</sup>**

*<sup>1</sup>University of Barcelona. Barcelona. <sup>2</sup>International School of TCM. Barcelona*

*Introduction:* Acupuncture is defined as the insertion of a solid needle into the body for the purpose of therapy, prevent-

ing disease or maintaining health. Anxiety and stress are an imbalance through disproportionately exaggerated responses, and are linked to painful stimuli and increased perception of pain. This is why patients experience more intense and lasting pain, and the treatment is more complicated for both the patient and the professional. The objective was to evaluate the efficacy of the use of acupuncture for anxiety in pediatric dentistry.

**Methodology:** A literature review was made on the basis of PubMed using the key words “pediatric anxiety” and “acupuncture”.

**Results:** We found 34 studies of which 5 were chosen due to the importance of the topic, among which they report on the efficacy of acupuncture, one of them compares the use of ear acupuncture with intranasal midazolam for the management of dental anxiety, both being equally effective but the absence of side effects when using acupuncture stands out. Other studies evaluate the effectiveness of acupuncture indicating that it is becoming a widely used strategy today. The points that are included in the treatment of anxiety are the Shen Men, Anxiety and Anti-stress, along with other combinations of points depending on the symptoms of the patient. The main points for patient relaxation are: heart 7 (H7), pericardium 6 (PC6) and liver 3 (L3).

**Conclusions:** Currently, TCM is increasingly used for treating different ailments or conditions. Considering that many pediatric patients present with anxiety and stress at the time of dental visits, acupuncture offers an option with a great therapeutic effect and with less tissue damage, alleviating the anxiety and stress caused by dental treatments, but more studies should be conducted to be able to use it in children.

## 227. ACUPUNCTURE FOR ANESTHESIA AND ANALGESIA IN PEDIATRIC DENTISTRY

**Cabezas, X.<sup>1</sup>; Boj, J.R.<sup>1</sup>; Conde, S.<sup>1</sup>; Espasa, E.<sup>1</sup>; Ping, L.<sup>2</sup>**  
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**Introduction and justification:** Acupuncture is a technique that has been around for thousands of years and it is widely used in current medical practice. It involves the insertion of a small, thin needle in the body for the purpose of normalizing physiology. There are other methods of stimulation that are electric, ultrasound and laser. The technique has a powerful analgesic, sedative and relaxing effects, which is the basis of its application in stomatological treatments. In dentistry it is used to treat a series of diseases, disorders and to facilitate dental therapies, in particular analgesia linked to dental procedures. Acupuncture points are usually searched for by palpation, another alternative is to use an electronic search.

**Objectives:** To present scientific information on the relationship of acupuncture with anesthesia and analgesia in Pediatric Dentistry. Also to clarify the most used acupuncture points in anesthesia and analgesia in dentistry.

**Methodology of the review:** A literature review was performed of scientific articles using the Medline, Scielo and PubMed databases, in Spanish and English. Keywords: Acupuncture, Chinese Medicine, Pediatric Dentistry.

**Result and discussion:** The literature search yielded 72 articles. Those that did not meet the research objectives were excluded, which finally left 10 articles. According to the studies reviewed, the 9 articles showed that there is a relationship between acupuncture and the effects of analgesia and anesthesia in dentistry. The most used acupuncture points for pain relief are: LU7 Broken sequence; TE2 Fluid Gate, TE21 Ear Gate, ST5 Great Welcome. LI4: Between the thumb and forefinger lies the most analgesic point. While the most used for anesthesia are: LI4 Joining the Valley; KI3 Bigger stream; ST2 Four Whites; LI20 Welcome fragrance. Regarding the effect of acupuncture in anesthesia, one article reported that for extracting teeth, the anesthesia generated with acupuncture is equal to anesthesia with medication. The analgesia is completed with stable vital signs and fewer adverse reactions.

**Conclusions:** Acupuncture is currently valid for stomatology therapy. It is an effective, economical, innocuous method, free of important side effects and usually produces pain relief. We found scientific evidence that supports the analgesic and anesthetic effects of acupuncture in dental procedures. Its use in pediatric dentistry is being studied. Articles have recently been found that uphold the advantages of using acupuncture in pediatric dentistry procedures.

## 235. KEY POINTS FOR THE PEDIATRIC DENTISTRY DIAGNOSIS OF RESPIRATORY OBSTRUCTION SYNDROME. A LITERATURE REVIEW

**Galván, G.; Barbón, A.; de la Cuesta, Y.; Arango, O.; Pellicer, L.D.**

European University Miguel de Cervantes – UEMC. Valladolid

**Introduction and justification:** Respiratory obstruction syndrome (ROS) refers to a set of signs and symptoms that suggest a disturbance of the effective air flow through the airways. This flow disturbance in the upper airways is directly related to the anatomical and functional characteristics of the nasal cavities, oral cavity and nasopharyngeal space. There is a relationship between the morphological anomalies that affect the arrangement of the teeth and maxillofacial development with the presence of habits such as oral breathing, atypical swallowing and lip interposition, also associated frequently with ROS symptoms. The aim of this review was to analyze the different tests and diagnostic methods described for detecting promptly in the dental practice those pediatric patients with ROS.

**Methodology of the review:** PubMed, Scielo and AEPAP sources were used to perform the search. The keywords used were: “Upper airway”, “Respiratory obstruction syndrome”,



“rapid expansion” and “air passages and dentofacial deformities”. Those articles that did not focus on the upper airways and ROS were excluded. After applying the exclusion criteria we were left with a selection of 10 articles for our literature review.

*Results and discussion:* An association between facial biotype and the presence of ROS was described, and the patients with an adenoid appearance had the highest prevalence of obstructive problems. Intermaxillary disturbances interfere with correct function and the relationship with body posture, favoring the appearance of posterior cranial rotation, neck and back lordosis and associated posture disturbances. The use of extra and intraoral scans, questionnaires on breathing habits, quality of sleep and diurnal behavior are considered successful diagnostic methods, but polysomnography is the gold standard for diagnosing the presence and severity of airway conditions. According to the literature, radiological tests for dental use such as CBCT or lateral cranial radiographs with the appropriate cephalometric analysis are useful for early examination and diagnosis of upper airways.

*Conclusions:*

1. Polysomnography is the examination of choice for the diagnosis of ROS.
2. Intra and extraoral examination, a questionnaire on nocturnal and diurnal habits together with a radiological examination can be used as the first diagnostic test to identify patients suffering from ROS.
3. A multidisciplinary team consisting of a pediatric dentist, myofunctional therapist, otolaryngologist, pediatrician and orthodontist is fundamental for the management of ROS.

#### 241. COMPARISON OF DEGREE OF MICROFILTRATION IN RESIN RESTORATIONS CARRIED OUT WITH TOTAL ETCH VS. A SELF-ETCH ADHESIVE. A REVIEW OF THE LITERATURE

**Costa, I.; Traver, C.; Marín, F.**  
*Catholic University of Valencia. Valencia*

*Introduction and justification:* The success rate of composite resin restorations depends on the adhesion to dental tissues to keep the filling material inside the cavity and prevent microfiltration. Until recently, all the adhesive systems used required a three-step process before the restoration. Currently, the manufacturers of adhesive systems are trying to simplify the application process through the use of self-etching adhesives. However, self-etching adhesives initially showed worse adhesion compared with multi-step adhesives. Since then, improvements have been made in the chemical composition of the systems. Currently, the degree of microfiltration with the use of different adhesive systems is still controversial, so the objective was to review the existing literature on the subject.

*Methodology of the review:* Several searches were carried out in the PubMed and EBSCO databases with different combinations of the following keywords: “adhesive”, “adhesion”, “microleakage”, “dental leakage” and “resin”. The inclusion criteria were articles in English or Spanish, available in full text and published in the last 10 years. Items that did not meet these requirements were excluded. At the end of the search, 9 articles were selected.

*Results and discussion:* A greater proportion of the studies indicated a lower filtration in the resin restorations in which total etch adhesive systems had been used, as opposed to those in which a self-etch adhesive had been used. However, there are studies in which there is less filtration with the use of self-etching systems or that find similar results when using a self-etch and a total etch adhesive. In addition, several authors agree that the degree of filtration varies depending on the surface of the tooth (occlusal or gingival) in which it is applied.

*Conclusions:* Although there is a greater number of studies that find less filtration in resin restorations in which a total etch adhesive has been used, it would be necessary to carry out more studies to be able to confirm that total etch adhesives work better than self-etch adhesives.

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## CASE REPORTS

### 19. MANAGEMENT OF MANDIBULAR MESIODENS IN THE PEDIATRIC PATIENT

**Valle, M.<sup>1</sup>; de la Cruz, B.<sup>1</sup>; Ríos, D.A.<sup>1</sup>; Verdugo, I.A.<sup>2</sup>; Gómez Llanos, H.<sup>2</sup>; García, J.C.<sup>2</sup>**

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*Introduction:* Supernumerary teeth are a dental anomaly of number, commonly found in the anterior part of the maxilla. The supernumerary tooth with the highest incidence is the mesiodens, with a worldwide prevalence of 90-95% in the upper jaw and 5-10% in the lower jaw. In Madrid, in 2006 a clinical case was presented of an 8-year-old female patient with permanent lower central incisors retained due to a mandibular mesiodens with a molar shape. Surgical extraction was performed, and the incisors erupted spontaneously. A proper diagnosis and treatment plan are necessary to avoid problems associated with the etiology, such as dental malpositions, root anomalies, cysts, delayed eruption or reabsorption of adjacent teeth.

*Case report:* A 7.3-year-old male patient in apparent good health attended the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, Mexico. During the anamnesis, the patient’s mother reported that her son had no family history of disease. Intraoral clinical inspection was

performed and a lower supernumerary tooth was observed in the anterior region, semi-erupted and rotated, and with lack of space in the segment. For the radiographic examination, orthopantomography and digital periapical radiography were requested, and an anomaly of number in the mandibular midline was observed, with rotation, and root development. The tooth germ of 32 was rotated and there not enough space to allow for eruption. The diagnosis was mandibular mesiodens. Simple extraction of the mesiodens with clinical and digital radiographic follow-up over 24 months was indicated as treatment. The patient was referred to the Orthopedics Clinic of the Jaws of the Pediatric Dentistry Specialty given the lack of space and overcrowding, and he is currently receiving treatment with Planas Class I Tracks for space recovery in the area between the permanent lower central left incisor and primary lower left canine for the permanent left lateral incisor.

*Conclusions/comments:* The early diagnosis and proper treatment of dental anomalies such as mandibular mesiodens by pediatric dentists will avoid future complications such as root resorption, cysts, diastemas and tooth malpositions.

## 20. IMPACTION OF MAXILLARY CANINE: EARLY INTERVENTION

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*Introduction:* The frequency of canine eruption anomalies is 2%. The maxillary canine germ is surrounded by the nasal cavity, orbital floor and anterior wall of the maxillary sinuses, and it is in contact with the root of the permanent lateral incisor, and the root of the primary canine. Between the age of 5 and 15 years the maxillary canine will measure 22 mm. In order to diagnose an impaction, the Ericsson and Kurol criteria are used, which evaluates canine angulation, height and buccal/palatal position. There are different treatments such as serial extraction starting with the extraction of the primary canine, repositioning of the canine with orthodontic traction and in cases of severe impaction of the permanent canine.

*Case report:* A 9-year-old male patient attended the Specialty Clinic in Pediatric Dentistry. Clinical inspection showed multiple carious lesions, crossbite of 12 and 22, and a lack of space in the upper and lower dental arch. Radiographically, the Ericsson and Kurol method revealed: a) angulation of the canine in relation to the midline: right grade 3 (32°) left grade 3 (31°); b) vertical distance from the occlusal plane in relation to the lateral incisor: 3° both canines; c) position of the cusp of the canine: grade 2 right with overlap on lower cusp half width of root, without passing the longitudinal axis of the lateral incisor, grade 1 left no overlapping of the cusp

of the canine with regard to the root of the lateral incisor; and d) anterior-posterior position of the apex of the canine: both canines in grade 2. Diagnosis: all the indicators showed a risk of canine impaction. Treatment: unlike the treatment followed by Rezende H, Silverio G. and Williams it was decided not to extract the primary canine, because the canine germs did not display root formation of two thirds, the lateral incisors were palatinized. This took into account that the root of the lateral incisor serves as the main guide for canine eruption and any anomaly will be the cause of its impaction, and the primary canine will then be the guide. Therefore, extraction of first primary molars was performed, selective filing of the second primary molars and orthopedic appliances used which led to the eruption of the canines. The patient is currently using a fixed orthodontic appliance and clinical follow-up of seven years.

*Conclusions/comments:* The early diagnosis of the position of the permanent canine germ allows early intervention and the impaction of the canine can be avoided.

## 22. INTERNAL DENTAL WHITENING WITH HYDROGEN PEROXIDE IN A PRIMARY TOOTH WITH DENTAL TRAUMA SEQUELAE

**Renteria, V.<sup>1</sup>; Verdugo, I.A.<sup>2</sup>; Gómez Llanos, H.<sup>2</sup>; de la Cruz, B.<sup>1</sup>; García, J.C.<sup>2</sup>**

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*Introduction:* Dyschromia in teeth has a varied etiology and is an alteration caused by hemorrhaging or pulpal necrosis. It may be transient or permanent. In the primary dentition it is a sequela that can be observed after a traumatic injury and it presents with different degrees of tonality. Internal tooth whitening is a conservative alternative that offers esthetic results for pigmented dental organs. Internal whitening treatments have been performed with 35% hydrogen peroxide in primary incisors with necrosis following traumatic injury and esthetic results have been obtained in 2 sessions. The aim of the present case is to show internal teeth whitening with hydrogen peroxide in a primary tooth with sequelae following dental trauma.

*Case report:* A 3.4-year-old male patient attended the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, apparently in good health, accompanied by his mother who reported a history of dental trauma, and who had observed a change in color in a tooth one month after the trauma. The intraoral inspection revealed multiple carious lesions and a change in color of the upper right central incisor. The occlusal radiograph revealed periodontal ligament space widening with superficial external root resorption on the right side of the root in the apical third and a root canal with no obliteration. Diagnosis was necrosis of tooth 51 due

to dental trauma, without involvement of the permanent tooth germ. The initial treatment consisted in a pulpectomy. A carbide 330 drill was used for access, instrumentation was performed with K-type files and the obturation was done with calcium hydroxide in iodoform paste (Vitapex®) and eugenol free zinc oxide. At the second appointment whitening was started with total isolation, the temporary material was removed from the pulp chamber, and the duct was sealed with glass ionomer (Vitrebond™). A sterile swab was placed in the pulp chamber with 35% hydrogen peroxide (*Opalescence® Endo*) and sealed with temporary material. A week later the crown portion of the tooth was whiter, and the procedure was repeated. The temporary material and swab were eliminated, a new one placed, with 35% hydrogen peroxide. The permanent filling with glass ionomer and resin was made a week later. Clinical and radiographic monitoring was performed every three months and optimal results were obtained with regard to color and esthetics.

*Conclusions/comments:* Internal teeth whitening can be an alternative with excellent results for teeth with dyschromia due to dental trauma.

### 31. AN ALTERNATIVE TO THE SURGICAL TECHNIQUE FOR TREATING A DENTIGEROUS CYST IN A CHILD PATIENT

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*Introduction:* Dentigerous cysts, associated with a tooth germ or an erupted tooth, are the most common cysts in children. Treatment options include cystectomy, decompression or marsupialization, adjuvant techniques, and surgical resection. Marsupialization and decompression are the treatments of choice when it comes to cysts in children in the deciduous or mixed dentition. Children have greater potential than adults to regenerate bone, and teeth with open apexes have greater eruption ability. By reducing the size of the cyst, adjacent structures and tissues can be conserved, and local complications reduced when compared to the surgical technique.

*Case report:* A 12-year-old male patient with no systemic history attended for a control visit. Radiographically, a radiolucent mandibular lesion was found under tooth 8.5 with well-defined edges, and which included the tooth germ of 4.5. It was compatible with a dentigerous cyst. A lateral displacement of the tooth germ 4.5 was observed. The extraction of tooth 8.5 was carried out. An impression was made after placing a sheath in the post-extraction area to allow communication with the cyst. A removable appliance with a built-in drainage tube was placed a week later. Drainage and maintenance guidelines were indicated to the patient. Monthly controls were carried out during which the eruption of tooth germ 4.5 was observed together with an improvement in the cyst.

*Conclusions:* In this case, the marsupialization technique was chosen because it is conservative, and tooth 4.5 could be preserved, but which may have been lost, had immediate surgical resection been performed. The treatment is long and painstaking, and the cooperation of the child and family members is needed to resolve the case.

### 32. MOLAR INCISOR HYPOMINERALIZATION. DEGREES OF SEVERITY AND ASSOCIATED COMPLICATIONS

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*Introduction:* Molar-incisor hypomineralization (MIH) is a structural anomaly of the enamel that is characterized by a decrease in the degree of mineralization. That is why it is a qualitative defect. The affected teeth are the first permanent molars but, in some cases, the permanent incisors are also affected. According to the severity spectrum, the enamel can present with or without a loss of structure, with opaque, white, yellow or brown spots. If there are cavities, it is common for these to be located on atypical surfaces, for example on the cusps or buccal aspects of the molars. Microscopically, the enamel is thin and porous, with a disorganized structure and larger inter-prismatic spaces, which leads to bacterial infiltration and hyperaemia of the pulp. These structural facts can help explain hypersensitivity. Currently, much attention is being given to clarify and understand the etiology. The causes of MIH are little known, but it is believed to have a multifactorial origin.

*Case report:* A 7-year-old boy, with no relevant medical history, presented at the University Clinic of the Pediatric Dentistry Postgraduate School of Dentistry of Lisbon. The reason for the consultation was hypersensitivity and pain on chewing in the first permanent molars. On clinical and radiological examination, a severe MIH was diagnosed, associated with post-eruptive enamel fracture and decay in all the first molars. Tooth 46 was restored with esthetic resin, given it had a less severe form of MIH. However, the first upper molars were restored with stainless steel crowns. Tooth 36 showed pulp necrosis and root canal treatment was performed prior to the crown restoration. After 6 months of clinical monitoring, tooth 26 developed a dentoalveolar abscess, and complete endodontic treatment was performed. Following a year of monitoring, the patient is asymptomatic.

*Conclusions/comments:* This case report contains different degrees of MIH severity, which allows discussing the different conservative therapeutic options that best respond to this pathology. In addition, it warns of the need for closer monitoring of these patients once clinical complications have arisen.

### 38. NEW ALTERNATIVES IN BIOMATERIALS IN VITAL PULP THERAPY FOR DECIDUOUS TEETH: A CASE REPORT

Lazo, R.<sup>1</sup>; Aguilar, D.<sup>1</sup>; Abal, D.<sup>1</sup>; Rolando, G.<sup>1</sup>; Chipana, C.<sup>1</sup>; Vázquez, F.<sup>2</sup>

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**Introduction:** Biomaterials are substances with a synthetic or natural origin that increase or replace any tissue, either partially or totally. There are studies on the biomaterials used in vital pulp therapy. The enamel matrix protein derivative (Emdogain) is a natural biomaterial, which encourages pulp repair by imitating odontogenesis. It encourages the formation of reparative dentin. Bioactive glass is a synthetic regenerative and tissue activating biomaterial composed of silicate, calcium oxide, phosphorus and sodium. It is an excellent remineralizing and biomineralizing agent for dentine and pulp tissue. In addition, because it is highly alkaline it discourages bacterial growth. Pure bioactive glass (Biodentine®) is a pulp protector applied to dentine and directly to pulp tissue. Bioactive glass combined with resin or glass ionomers are used only in dentine to protect and restore the dentin pulp complex.

**Case report:** This was a female patient aged 4 years in good general health and with no medical history. The intraoral clinical examination revealed deep carious lesions in teeth 55, 64, 65, 75, 74, 84 with no symptoms. On radiographic examination teeth 55, 64, 65, 74, 75 and 84 showed a radiolucent area by the dentine with possible pulp involvement. Definitive diagnosis: reversible pulpitis in teeth 55, 64, 65, 74, 75 and 84. Treatment: teeth 55 and 65 indirect pulp capping with Activa Kids bioactive restorative glass (Pulpdent), and Riva Light cure HV (SDI) respectively; direct pulp therapy for tooth 64 with enamel protein (Emdogain); Pulpotomy with Biodentine™ bioactive glass for 74 and 75 and enamel protein Emdogain in tooth 84. A week later steel crowns were placed on teeth 64 and 84 and a month later on teeth 74 and 75. Clinical and radiographic monitoring was carried out at one month, six months and 12 months.

**Conclusions/comments:** In the case report presented there is an absence of clinical symptoms and radiographic signs which would indicate the preservation of pulp vitality after the 12 months follow-up of these deciduous molars treated with biomaterials. It is therefore concluded that there is no significant difference between the different biomaterials used in vital pulp treatments.

### 70. DENS INVAGINATUS: DIAGNOSIS, TREATMENT AND FOLLOW-UP

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**Introduction:** *Dens invaginatus*, also known as *dens in dens*, is a dental anomaly that arises from an invagination of the outer surface into the interior of a tooth during its development. It can affect the crown as a result of a bending of the enamel into the dental papilla and at the root it can affect the pulp chamber or the root canal. It is the result of an invagination of the Hertwig epithelial root sheath that leads to an accentuation of the normal longitudinal groove of the root. Oehlers made the classification of *dens invaginatus* according to the degree of involvement of the tooth: a) type I: invagination ends in a blind sac, and is confined in the crown; type II: the invagination extends to the cemento-enamel junction and extends or not to the pulp of the root; and type III: it extends to the interior of the root, penetrating the periodontium, sometimes with a second apical foramen. This anomaly affects mainly the permanent teeth, and the primary teeth to a lesser extent. The reported prevalence in the permanent dentition is between 0.3% and 10%, and the permanent upper lateral teeth are more commonly affected.

**Case report:** An 11-year-old male patient attended the Pediatric Dentistry Specialty Clinic of the Autonomous University of Baja California, Mexico. Anamnesis revealed apparent good physical and mental health, no previous medical history, no hereditary family diseases nor a history of any dental trauma. The intraoral clinical examination showed mixed dentition, previous restorations, multiple carious lesions and the permanent upper right lateral incisor with a shape anomaly affecting the clinical crown. A radiographic study was performed and a radiolucent line was observed by the crown, but no periapical lesion. The diagnosis was type I *dens invaginatus*, with a grade 1 carious lesion in the invagination. Preventive treatments were carried out: prophylaxis, sealing of pits and fissures and application of fluoride varnish; restorative treatments: pulp treatments, and chromium-steel crowns and resin restorations. In tooth 12 the carious lesion was removed and it was restored with glass ionomer. The two-month follow-up was favorable, following the prevention program.

**Conclusions/comments:** The management of cases of abnormalities regarding the shape of teeth depends completely on the early and accurate diagnosis of the malformation, which will favor prognosis, facilitating treatment and a suitable follow-up.

### 92. DOUBLE TEETH: TOOTH GEMINATION

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<sup>1</sup>European University of Madrid. Madrid. <sup>2</sup>Jiménez Díaz Foundation. Madrid

**Introduction:** Double teeth are anomalies that affect tooth size that arise during the morphodifferentiation stage. There are two essential disorders: fusion (union of two tooth germs) and gemination (incomplete division of a tooth germ). Both are more frequent in the primary dentition (2.5%), in the



anterior sector, with a predominance of fusion in the lower arch and gemination in the upper arch. Its frequency in the permanent dentition is rare, and is 0.8%, equally affecting the maxilla and mandible. The differential diagnosis between the two is, in many cases, difficult to establish, and clinical examination, tooth count, radiographic analysis and even CT or CBCT, are tests that are necessary for a more concrete diagnosis. The most important clinical consequences include dental caries in the groove between the two halves of the affected tooth, esthetic disturbances, periodontal problems, malpositions and/or dental crowding. The treatment requires a multidisciplinary approach ranging from more conservative options such as placing sealants and resin restorations, to mesio-distal carving, endodontics, hemi-sectioning, orthodontics and even extraction.

*Case report:* The case of a girl aged 7.2 years who attended the consultation with gemination of tooth 21 is described. The tooth was in the process of eruption and it had a deep groove in the buccal aspect. The patient reported sensitivity to cold. The treatment carried out to date is described: provisional filling with composite resin on the groove to improve the aesthetic appearance, decrease sensitivity and prevent the accumulation of plaque. After this, a gingivectomy was performed on the tooth. Currently the patient attends for periodic check-ups to control development and maturing as well as the possible appearance of complications.

*Conclusions/comments:* Despite being a phenomenon that rarely presents in pediatric dentistry, gemination in the permanent teeth requires close follow-up and individualized treatment, which must be adapted to the growth phases of each child patient.

## 96. RETT SYNDROME: ONE DISEASE, TWO REALITIES

**Abad Madrid, M.; Brito Trindade Almeida, M.; Pérez Silva, A.; Serna Muñoz, C.; Ortiz Ruiz, A.J.**

*Master's degree in Integrated Child dentistry. University of Murcia. Murcia*

*Introduction:* Rett syndrome is a neurodevelopmental disorder linked to the X chromosome. It is characterized by a lack of psychomotor development with autism, culminating in slow brain growth, convulsions and stereotyped hand movements. It mainly affects the female sex although it has been observed, exceptionally, in the male sex.

*Case reports:* A.G. and P.G. aged 3 years, two sisters, monozygotic diamniotic twins with Rett syndrome, attended the Babies Clinic of the Master's course of Integrated Children's Dentistry of the University of Murcia, for preventive treatment. A.G., the second to be born, carried the c.459C>G change in the MECP2 gene, and P.G., the first to be born, was also a carrier of the c.459C>G change in the MECP2 gene by heterozygous carriers. A.G. presents with slow brain growth and muscular hypotonia, apnea, tachypnea

and epileptic seizures. She is stage I, follows a diet rich in omega-3 antioxidants, with minced and soft food. Her sister, P.G., presents with autistic behavior, good eye contact, stereotyped hand movements and paroxysmal episodes of laughter and crying, diurnal bruxism, drooling and lingual interposition habit. She is stage II, and follows a diet that is similar to that of her sisters but not quite so minced or soft. With regard to the mouth A.G. has a large amount of biofilm and mild gingival inflammation in the upper and lower posterior area. P.G. has an absence of biofilm and gingival inflammation, but small spots of hypomineralization in the lower molars and lower canine, and signs of bruxism and open bite due to a lingual interposition habit.

*Conclusions/comments:* Patients with Rett syndrome have greater periodontal disturbances than the general population mainly due to their motor limitations, parafunctional habits of diurnal bruxism, drooling, stereotyped lingual movements, oral breathing and lingual interposition habit. Taking into account the evolutionary stage of each of the twins, a personalized oral hygiene plan was proposed, in order to achieve the best possible oral health status.

## 106. AVULSION AND REPLANTATION OF AN INCISOR WITH INCOMPLETE ROOT DEVELOPMENT AND APEXIFICATION WITH MTA. LONG TERM MONITORING

**Castejón, I.; Cortés, O.; Guzmán, S.; Magán, R.**

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*Introduction:* In the permanent dentition, the incisors most prone to suffering avulsion are those with incomplete development and in the eruption phase, because the periodontal ligament has a very loose structure. Maxillary overjet and dental protrusion are predisposing factors for this injury. The treatment for avulsion is replantation, but the percentage of long-term success varies depending on the specific clinical conditions of each case in particular. The treatment is a challenge for dentists and it will depend on multiple factors: extraoral dry time, storage medium, root development, immediate treatment and splinting, together with the monitoring made to control progress.

*Case report:* Patient aged 8 years suffered a traumatic injury to the permanent right central incisor, with an open apex, in a camp pool. After searching the pool for 45 minutes, the tooth is located and it undergoes replantation and subsequent splinting by the mother. At one month, pulp necrosis is observed, apexification with MTA and root canal therapy are performed. This is monitored, and the only complication is a color change in the crown. Given the considerable overjet that could increase the risk of a new traumatic injury, orthodontic treatment is decided on. Once completed, as stability is observed, internal tooth whitening is performed on the non-vital tooth. Regular monitoring is advised.

*Conclusions/comments:* Extraoral dry time is the factor that most affects the success of replantation. In this case, the immediate replantation after 45 min in water reduced the probability of cell necrosis, and the fact that it was a pool with adequate chlorine control decreased the contamination of the periodontal ligament, favoring its regeneration and avoiding ankylosis. The apexification with MTA, produced adequate results, and a color change that could be resolved with internal whitening. The replantation of a young permanent tooth in a growing patient is the “best treatment option” for the patient. Not just for maintaining the alveolar ridge, but also for its function, orthodontic correction and aesthetic appearance.

### 109. THE USE OF GOPEX AS MINIMUM INTERVENTION THERAPY FOR GUIDING THE GROWTH OF PEDIATRIC PATIENTS

**Armenteros, A.; Jiménez, G.; Ruiz de Castañeda, E.; Gatón, P.**

*MTDENTAL. Barcelona*

*Introduction:* The correct functions of breathing, mastication and swallowing, as well as good body posture during the growing period, are fundamental for the proper development of the bones, muscles and joints of the stomatognathic system. The Good Oral Posture Exercises Therapy (GOPEX), consisting of exercises based on the tropic premise (tongue resting on the palate, teeth in gentle contact and lips sealed), seeks to guide the growth of patients and balance the forces acting in the masticatory apparatus. It also aims to improve the quality of life of the patient by achieving healthier physiological development, and by preventing any respiratory problems and sleep disorders or abnormalities. The evaluation of the therapy is based on the recording and analysis of daily videos made in the family environment of the patient and supervised by clinical staff, as well as through photographic analysis and swallowing tests performed in the clinic on a monthly basis.

*Case report:* Several clinical cases are presented, with patients ages between 5 and 11 years with dental malocclusions, lip incompetence and oral respiration, who are currently under treatment with GOPEX. The exercises are detailed, focused on achieving correct lingual positioning, nasal breathing, alternating unilateral mastication and swallowing. As from the first month, objective changes were observed in posture (correction of cervical hyperlordosis), in the relationship between the jaws, in profile type and in the respiratory and masticatory functions of the patients. Similarly, the patients' family environment underwent qualitative changes in sleep quality and respiration improvements.

*Conclusions/comments:*

1. In modern societies, the incidence of dental and skeletal malocclusions is increasing, among other factors, due to parafunctions, poor postural and eating habits. Through early diagnosis and by applying GOPEX we can act, in

a minimally invasive way, redirecting anomalous growth by correcting these habits and parafunctions.

2. GOPEX can be a basic action tool for the early treatment of malocclusions without resorting to appliances, or for improving the initial stages, development and stability of orthodontic and orthopedic treatment in pediatric patients.

### 139. AMELOGENESIS IMPERFECTA. A CASE REPORT WITH A 10 YEAR FOLLOW-UP

**Claro, A.C.; Yuste, S.; Martínez, P.; Rodríguez, I.; Lluch, C.; Guinot, F.**

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*Introduction:* Amelogenesis imperfecta (AI) is a structural defect of the enamel, clinically and genetically diverse, caused by mutations in the genes (X chromosome) that are critical for its formation. The incidence of AI can vary according to the population studied, ranging from 1/7000 to 1/14,000. It may affect the primary dentition, permanent dentition or both, as well as only one tooth or the entire dentition. Depending on the phenotype, the mechanism of development and the form of inheritance, AI can be classified into four main types: hypoplastic, hypomaturation, hypocalcified, and hypoplastic hypomaturation with taurodontism, which may be associated with an open bite. Among the clinical implications of AI are low susceptibility to caries, masticatory problems, thermal and chemical sensitivity, speech problems, deep overbite, low self-esteem, excessive calculus deposits, and gingival hyperplasia. Clinical management depends on the dental stage: primary stage (primary and mixed dentition), transitory stage (when the permanent teeth erupt continuing into adulthood) and the permanent stage (in adults).

*Case report:* Male patient, aged 7 years and 8 months, who attended the Master's course in Comprehensive Pediatric Dentistry for a dental examination. After carrying out the anamnesis and clinical examination, hypomaturation type *amelogenesis imperfecta* is diagnosed in all the primary and permanent dentition. After performing the usual radiographic tests, caries lesions were diagnosed in the first four permanent molars and unilateral right posterior crossbite, and a decision was taken to perform conservative and orthopedic treatment. The patient has attended for periodic monitoring with a total follow-up of 10 years.

*Conclusions/comments:* AI not only affects the dentition of the patient as there is also an impact on psychosocial development. Therefore, dental management must be aimed at preserving tooth structure, improving function, and reducing tooth sensitivity, as well as improving the esthetic appearance of these patients, especially during preadolescence and adolescence. For all these reasons, an early diagnosis of AI is necessary in order to prevent the patient from losing orofacial and esthetic functions, and the diagnosis and treatment should be interdisciplinary. It is very important to provide monitoring, oral hygiene instructions, prophylaxis and topical fluoride applications every 3 months.

### 165. SINGLE FILE ROTARY AND MANUAL SYSTEMS FOR PULPECTOMIES IN PRIMARY MOLARS: CASE REPORT

**Burbano, D.; Requena, C.; Veloso, A.; Esqueira, A.; Virolés, M.M.; Guinot, F.**

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*Introduction:* Rotary instrumentation in pediatric dentistry is an emerging concept introduced by Barr et al. in the year 2000. However, the morphological challenges of primary roots, require an improvement in the design of these instruments in order to avoid complications. Currently, single file reciprocating systems have emerged, and it appears that they can be used in the preparation of canal curvatures of primary molars in *in vitro* studies, reducing preparation time, simplifying the procedure, and promoting patient cooperation with a settings capacity that is similar to continuous rotation instruments. We compared the preparation of two root canals, one with a manual system currently used in pediatric dentistry, and another with a single file reciprocating system.

*Case report:* We present 2 cases of root canal therapy carried out in the university clinic, one was performed with K hand files and the other was performed with the Reciproc system. The patients selected required a pulpectomy in a lower second molar. There was enough remaining structure to allow a restoration, and no internal or external pathological resorption, nor interradicular radiolucencies and/or periapical lesions. In both cases work time, quality of the obturation, ease of application of the obturating material, operator's ease on instrumentation, and the child's behavior were compared.

*Conclusions/comments:* No differences were found in the patient's behavior according to the technique used. With regard to the ease of operation, greater ease was observed with the Reciproc rotary system, as well as a decrease in instrumentation time. With respect to the quality of the canals, we found no difference between the two systems. It is important to emphasize that a larger sample of patients is necessary to be able to compare the two techniques and obtain significant results.

### 213. THE IMPACT OF SEVERE DENTAL TRAUMA ON QUALITY OF LIFE OF AN ADOLESCENT: CASE REPORT

**Esplugues, C.; Estrela, F.; Borrás, C.; Martí, M.J.; Faubel, A.; Catalá, M.**

*Máster de Odontopediatría. Clínica Odontológica. Universitat de València. Valencia*

*Introduction:* Today, traumatic dental injuries are a therapeutic challenge, since they are the most frequent cause of pediatric dentistry visits after caries. Approximately 30% of children in the primary dentition and 22% in the permanent dentition suffer significant dental trauma. The severity of the

dental trauma can vary from a small enamel fracture to an avulsion. Trauma can have physical, psychological, economic and functional consequences for our patients. Therefore, assessing the impact on the quality of life of a patient after trauma is very important.

*Case report:* A 7-year-old patient attended the Pediatric Dentistry Unit of the University of Valencia, after suffering a traumatic dental injury 4 days previously. She brought a report from the emergencies department of the hospital where she had been diagnosed with intrusive luxation and fracture of the incisal edge of tooth 11. Her treatment consisted in reduction and splinting. The clinical and radiological examination revealed an immature tooth with an open apex and visits were scheduled to assess removing the splint and treating the tooth. Two months after the trauma, an abscess was observed on tooth 11 and apexification was decided on. One year later, after achieving an apical seal, the root canal treatment with gutta-percha was completed. Approximately 3 years later the patient made an emergency visit because of an abscess by tooth 11. After the clinical and radiological examination, an apical lesion was observed and an apicoectomy was decided on. On the day of the intervention, on raising the flap, the root was seen to burst. At that point it was decided to extract the tooth and carry out bone regeneration, and a provisional Maryland bridge with its own tooth was fitted. Over the 6 years following the trauma, more than 30 visits were scheduled for treatment and monitoring, and during this time it was possible to observe the psychological effect of losing an incisor at the age of 13 years.

*Conclusions/comments:* The loss of a tooth in the anterior sector has a negative impact on a child's quality of life, as well as a psychological, physical and functional effect. Moreover, follow-up dental treatment until reaching adulthood in order to carry out definitive treatment requires multiple visits to the dental office and a financial cost.

### 214. COMPLETE PROSTHESIS IN PATIENTS UNDER THE AGE OF 7 YEARS WITH ECTODERMAL DYSPLASIA

**Selva, I.; Velló, M.A.; Aura, I.; Zaragoza, A.; Blanquer, M.; Catalá, M.**

*Master's degree in Pediatric Dentistry. Dental clinic. University of Valencia. Valencia*

*Introduction:* Anhidrotic ectodermal dysplasia is the most common form of ectodermal dysplasia. The tissues affected arise from the embryonic ectoderm and have a characteristic triad of symptoms: hypohidrosis, hypotrichosis and hypodontia. To minimize orofacial deterioration, esthetic appearance, nutrition and speech, initial prosthetic rehabilitation should be performed at an early age. Depending on the child's age and cooperation, the treatment options will vary from a removable prosthesis in the early years as provisional treatment, to the placement of implants and fixed prostheses on implants at an older age.

*Case report:* Boy aged 2 years and 3 months attends the clinic because of eating problems. He has a report and diagnosis of ectodermal dysplasia. On examination, only two teeth are detected in the maxillary area with a conoid shape. The mother is insistent about changing the shape of the conoid teeth because the child is hurting his lower lip and she is afraid that he will bite other children. After several visits for desensitization and to adapt the child to the clinical environment, at the age of 3 years and 7 months the treatment is started. First, the upper incisors are restored using composite and acetate crowns to improve esthetics, with premedication of oral midazolam. At the age of 4 years and 3 months, the prosthesis to improve mastication is prepared, and the parents are told that the treatment with complete prostheses would not be completely satisfactory. A visit is made to take impressions, followed by a second visit for individual impression trays, and a third visit for testing and adapting the base frame. On the fourth visit, the individual trays have to be lengthened in order to take a new impression. On the fifth visit the teeth are tested and finally on the last visit the prosthesis is handed over.

*Conclusions/comments:* The preparation of prostheses in young children has an added difficulty given limited cooperation, and the need to adapt the tools and the process. However, prosthetic rehabilitation in these children quickly improves their self-esteem and their quality of life.

#### **215. DISTURBANCE IN THE ERUPTION ASSOCIATED WITH A GENETIC DISORDER: REPORT OF A CLINICAL CASE**

**Blanquer, M.; Ferrer, I.; García, E.; Selva, I.; Estrela, F.; Catalá-Pizarro, M.**

*Master in Pediatric Dentistry. Dental clinic. University of Valencia. Valencia*

*Introduction:* Dental eruption is defined as the movement of a tooth from its development site to its functional position in the oral cavity. The genes involved in this process are located mainly in the dental follicle and the *stellate reticulum*. An ectopic eruption may be a disturbance in the eruptive path due to a physical barrier, a change in the eruptive path, or because from the beginning the tooth develops out of its normal position.

*Case report:* A 4-year-old male attends because of non-erupting second primary molars. The patient is diagnosed with reciprocal chromosomal translocation with karyotype: 46XY, t (8; 9) (q24; q31), and slightly delayed growth. Clinical examination reveals an absence of 7.5 and 8.5, and a radiograph confirms their existence. In the following years the central lower incisors are replaced, but the second lower primary molars remain embedded. A symmetrical and bilateral protuberance is detected on the buccal aspect that is the root tips of the second primary molars. At the age of 9, the surgical extraction of 7.5 and 8.5 was carried out with general anesthesia. In the intervention, two supernumerary teeth

located by the lingual aspect of the first permanent molars are also extracted. One year later treatment with interceptive orthodontics is carried out given the compression in the maxilla and anterior and posterior crossbite. The first permanent molars appear to have impacted due to malposition. At the age of 11 years, surgery was performed to expose the crown of 3.6 and 4.6 for orthodontic traction and relocation in the arch. At age of 12, 4.6 was repositioned adequately but the ectopic position of 3.6 persists and it is surgically removed under general anesthesia together with two new supernumerary teeth in the first and second quadrants.

*Conclusions/comments:* The symmetry of the eruptive disturbance is striking together with the malpositions of 7.5 and 8.5 and then of 3.6 and 4.6 of this patient and the presence of supernumeraries. However, the cytogenetic report specifies that the translocation in principle does not involve any pathology, without ruling out small genetic changes due to this disturbance. The case presented here includes a genetic study carried out for other reasons that supports the genetic etiology of the eruption disturbance diagnosed.

#### **216. MINIMALLY INVASIVE DENTISTRY FOR DENTIN: 38% SILVER DIAMINE FLUORIDE AND BIOACTIVE GLASS AS AN ALTERNATIVE IN INFANTS: A CASE REPORT**

**Lazo, R.<sup>1</sup>; Chambi, K.<sup>1</sup>; Morán, A.<sup>1</sup>; Aguilar, D.<sup>1</sup>; Abal, D.<sup>1</sup>; Vázquez, F.<sup>2</sup>**

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*Introduction:* Silver diamine fluoride is a colorless liquid containing silver and fluoride. The silver acts as an antimicrobial agent, the fluoride promotes remineralization, and the ammonium stabilizes the high concentrations in the solution. Considered an excellent desensitizing agent, just one application will form insoluble precipitates of calcium and phosphate that physically block the dentinal tubules. Diamine fluoride halts caries, and will act on the enamel to form fluorapatite. In the dentin it reacts with the proteins to form a layer of silver protein which is resistant to bacterial acids. The application of silver diamine fluoride is a simple, non-invasive, safe and efficient procedure, which is why it is recommended as alternative medication for conservative treatment of an active, non-symptomatic, caries lesion in child patients. The treatment success rate for deep non-symptomatic lesions in dentin is 91%. Although this is high, it does not reach 100%, so it is important to include another treatment such as a cavity seal with a bioactive glass-based restorative material.

*Case report:* Female patient aged 2 years of age with good general health. The intraoral clinical examination revealed deep carious lesions in 54, 52, 64, 62, 75, 74, 84, but no symptoms. On radiographic examination, teeth 54, 52, 64, 62, 75, 74, 84 revealed a radiolucent image by the dentin without pulp involvement. *Definitive diagnosis:* reversible



pulpitis in teeth 54, 52, 64, 62, 75, 74, 84. *Treatment*: removal of infected dentin with a spoon excavator and application of 38% silver diamine fluoride (Advantage arrest). The cavities of teeth 75, 74, 84 were immediately sealed with a bioactive glass-based material (Activa Kids, Pulpdent), and the cavities of teeth 54, 52, 64, 62 were sealed after 6 months. *Monitoring*: clinical evaluation was performed at one week, one month, and at 6 and 12 months; radiographic evaluation was performed at 6 and 12 months.

*Conclusions/comments*: In the case report presented there is absence of clinical and radiographic signs, which shows the arrest of the dentin caries after a 12 month follow-up. It can therefore be concluded that cavity seals with a Bioactive glass material improves the success of the treatment.

### 232. REGIONAL ODONTODYSPLASIA: A CASE REPORT

**Toledano, S.; Heredia, C.; García-Navas, L.; Costa, F.; Riobobos, M.F.**

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*Introduction*: Regional odontodysplasia is an anomaly of dental development, of unknown etiology, which affects dental morphogenesis. It can affect both the primary and secondary dentition and it is more common to find a single quadrant affected. The teeth involved have hypoplastic crowns, and may have pulp disease, periapical inflammation and considerable decay. Radiographically the teeth affected appear as “ghost teeth”. The treatment plan for this anomaly is determined by the age of the patient, the symptoms, and the esthetic and/or functional needs. Nevertheless, there is still controversy over whether the teeth affected should be maintained for the normal development of the jaws, or removed to avoid serious infections.

*Case report*: The case is presented of an 8-year-old girl who attends the pediatric dentistry department due to localized infection in the third quadrant. During the anamnesis, the mother reports that she had a traumatic birth, and a hemangioma was visible on the left side of the mandible. On clinical examination, it is observed that only the left lower central incisor and the left first permanent molar are present in the third quadrant, the latter appearing hypoplastic. An abscess by tooth 3.6 is also observed together with molar extrusion in the second quadrant. On radiographic examination, the tooth germs of the lateral incisor, canine and lower premolars revealed earlier developmental stages than their contralateral counterparts. The first left lower permanent molar had the appearance of a “ghost tooth”. However, the second secondary molar showed development similar to its contralateral counterpart. This clinical picture was compatible with regional odontodysplasia. After performing a CT scan and observing the proximity of the lower dental nerve to tooth 3.6, the patient is referred to the department of maxillofacial surgery. This case required multidisciplinary treatment (pediatric dentist,

maxillofacial surgeon, orthodontist). First, good oral health had to be established, masticatory function restored, general bone and dental development controlled, the development of those teeth with odontodysplasia monitored, and if necessary treated first surgically and then with long-term prosthetic rehabilitation.

*Conclusions*: Pediatric dentists should have in depth knowledge of these dental development anomalies because the early diagnosis of this pathology is critical for treatment.

### 236. LUDWIG'S ANGINA OF DENTAL ORIGIN IN A PEDIATRIC PATIENT

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*Introduction*: The majority of infections of the oral cavity are odontogenic, being local and well circumscribed. A polymicrobial etiology involves the presence of both aerobic and anaerobic bacteria. Sometimes they spread by continuity, invading tissues or deep anatomical spaces. As a result of long distance dissemination, organs may be affected and more serious processes may be triggered. In pediatric patients, the spread can occur rapidly, causing systemic manifestations such as fever, dehydration, difficulty swallowing and airway compromise.

*Case report*: 9-year-old girl attended the emergency department of the Sant Joan de Déu Hospital due to swelling on the left side of the jaw for 4 days that had been treated with amoxicillin. She had fever (39°), general discomfort, limited mouth opening, left submandibular cellulitis, lingual propulsion and elevation, and difficulty swallowing. Hospitalization was indicated. On oral examination, she had second phase mixed dentition, dry mouth, poor oral hygiene and minor to moderate molar incisor hypomineralization (MIH) of upper incisors which was severe in the permanent mandibular molars. Radiologically, molar 36 revealed extensive occlusal caries. Contrast CT was performed that revealed the presence of an abscess in the floor of the mouth that exceeded the midline (36 x 25 x 17 mm) and a defect of the lingual cortex was found close to molar 36. Under general anesthesia, emergency extraction of the molar was performed together with debridement using a submental approach. An open non-aspiration Penrose-type drain was fitted which was fixed to the skin

using stitches. In 48h the clinical progress was very favorable and after four days the drain was removed.

*Conclusions/comments:* Odontogenic infections, especially in the mandible, can evolve to severe symptoms of diffuse inframylohyoid cellulitis called Ludwig's Angina. Cellulitis of the floor of the mouth is considered an emergency because it can compromise the patient's breathing. Taking into account the rapid onset, it is extremely important to be familiar with the criteria necessary to make a firm diagnosis. All this will allow us to carry out the most appropriate treatment and prevent the onset of possible life threatening complications.

#### 242. BEDNAR'S ULCER IN A 7 MONTH-OLD INFANT

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*Introduction:* Bednar's ulcer, first described in 1850, is an oral lesion that affects young children during breastfeeding. It arises on the back of the palate and most of the time it is related to the traumatic effect of a non-anatomic bottle nipple, although sometimes it can also occur in relation to breastfeeding. In recent years, it is rarely mentioned in the scientific literature, although some studies seem to indicate that its incidence is greater than expected and it may as a result be underdiagnosed.

*Case report:* A 6 month old, bottle-fed patient was taken to her pediatrician for a routine check-up. During the examination of the mouth, the pediatrician detected an ulcer in the posterior third of the right palate and the girl was recalled for monitoring after one month. During the following check-up, the mother reported that the girl had feeding problems, and that she was crying and irritable. A slowdown in weight gain was observed. In the oral examination, the persistence of the ulcer was confirmed and the patient was sent to Pediatric Dentistry, and a possible diagnosis of Bednar's ulcer was put forward. After the oral examination and thorough anamnesis, the pediatric dentist came to the same diagnostic conclusion of Bednar's ulcer. A series of recommendations and explanations were given to the mother about feeding and the patient was recalled after two weeks. As the ulcer had practically disappeared, the diagnosis of Bednar's ulcer was confirmed.

*Conclusions/comments:*

1. The detection of an oral lesion for an unknown reason, and that persists for more than a month in an infant, obliges us to set in motion different actions aimed at clarifying a possible infectious or autoimmune etiology. However, the identification of a clearly traumatic origin, such as the mechanical action of a bottle nipple, and feeding practices that are not completely correct will, through the anamnesis, leads us to a diagnostic impression of Bednar's ulcer. A series of corrective measures can be established so that after a time, and

once the ulcer has healed, the final diagnosis can be given, thus avoiding tests that are both costly and even invasive.

2. It is necessary to exhaust the full potential of a proper anamnesis before resorting to diagnostic tests that may be unnecessary.
3. We must continue to encourage proper cooperation between specialists, which allows us to establish different points of view and share knowledge.

#### 246. AUTOTRANSPLANTATION OF AN ECTOPIC UPPER PREMOLAR TO ITS NORMAL POSITION WITH THE USE OF A DENTAL REPLICA. A CASE REPORT

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*Introduction:* The usual treatment for an ectopic eruption is repositioning the tooth using orthodontic traction. When this fails, or if the ectopic eruption is severe, tooth autotransplantation is a therapeutic option. In recent years the use of a resin replica made with 3D printing has been introduced following 3D radiological examinations (TAC, CBCT). This acts as a guide for the preparation of the recipient site, in order to minimize the risk of injury to the periodontal ligament, with regard to the conventional method. The aim of this work was to present a clinical case of autotransplantation using a dental replica printed in 3D.

*Case report:* A 16-year-old patient with a severely ectopic upper second premolar with a closed apex, had received orthodontic treatment to reposition it, with poor results. Autotransplantation was carried out using virtual planning based on the radiological CT records (Dentascan®) that showed the size of the tooth and the available space. For the intervention, the resin replica was prepared by 3D printing and the autotransplantation was performed under deep sedation and local anesthesia in the following manner: a) The ectopic premolar was surgically removed and preserved in sterile physiological saline; b) a socket was prepared using the dental replica to check for adaptation in the available space; c) the definitive tooth was implanted, and secured with a cross-suture splint; and d) the extraoral time of the tooth to be implanted was calculated as 10 minutes. Two weeks later root canal treatment was performed. Periodic clinical assessment was performed and the tooth made favorable progress.

*Comments:*

1. Tooth autotransplantation is a well-known procedure for replacing teeth in young people with severely ectopic teeth or an absence of teeth for various reasons.
2. Autotransplantation planning using 3D technology, and the impression of the tooth replica, in this case of ours, gave advantages such as, virtual simulation, a reduction

in extra-alveolar time of the donor tooth, reduction of multiple adjustment attempts, and preservation of the periodontal ligament cells of the donor tooth, improving the prognosis.

#### **247. PULP THERAPY AND RESTORATIVE TREATMENT OF PERMANENT CENTRAL TEETH IN A PEDIATRIC PATIENT FOLLOWING TRAUMATIC INJURY**

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*Objective:* Multidisciplinary treatment by periodontics, endodontics, rehabilitation and pediatrics teams for the conservation of a traumatized tooth, by means of pulp and restorative treatment.

*Introduction:* According to the WHO, of the various reasons for a dental consultation, dental trauma is in second position. Trauma to teeth that are still developing is common between ages 7 and 12 years, which is considered school age. This type of trauma carries serious complications such as pulp necrosis. Depending on the intensity and type of trauma, these can be classified into two basic groups: a) uncomplicated crowns fractures; and b) complicated crown fractures. It is important to take into account root development finalization and the closure of the apex, which will take up to 3 years following the eruption of the teeth. When performing any type of treatment on an affected tooth, Nolla status must be verified.

*Case report:* A 10-year-old female patient attended the pediatric dentistry clinic of the Autonomous University of Ciudad Juárez, reporting that: "She fell off a seesaw and broke her teeth". She had no medical history of disease. Clinical examination revealed an increase in volume of the upper lip, edema was found intraorally in the upper and lower mucosa and soft tissues. Teeth 8,9 (permanent upper central) has multiple fractures of the crown, the patient reported pain and discomfort. Radiographically we observed a cervical fracture of tooth 8 that was horizontal in its coronal portion and that involved the pulp chamber. In tooth 9 only a fracture was found in the coronal portion without direct involvement of the pulp chamber. Treatment plan: first, extraction was made of the affected coronal portion and instrumentation of tooth 8, and calcium hydroxide was placed and monitored. The tooth was then extruded and splinted for reconstruction. The tooth was reconstructed and monitored.

*Prognosis and evolution:* the tooth was monitored monthly and the periodontal status was evaluated. This was considered favorable as there was no mobility, reabsorption or manifestation of periapical damage. The patient was referred for periodontic treatment to continue with crown lengthening.

#### **248. COMPARISON OF THE CLINICAL APPLICATION OF AN ALKAZITE AND BIOACTIVE RESIN IN THE PRIMARY DENTITION: PRESENTATION OF A CASE REPORT**

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*Introduction:* In daily clinical practice, during the restoration of carious lesions a dentist will be confronted with different challenges that must be resolved. These should take into account the underlying biological principles of the work, and a profound knowledge of the dental biomaterials that are used should be included. Currently restorative materials are needed that not only replace lost tissue, but that are also bioactive. ACTIVA KIDS is an ionic restorative resin that stimulates the formation of mineral apatite and a natural remineralization process. On the other hand, Cention N is an "alkazite" restoration material, and a new category of filler material. Like compomers it is a subgroup in the class of composite material, sharing both the ability to release and recharge calcium, phosphate and fluoride ions.

*Case report:* the pediatric postgraduate dental clinic of the Autonomous University of Ciudad Juárez was visited by two male patients, both of whom were 1.8 years old, and who were suffering from early childhood caries of teeth in the anterior segment of the maxilla. After an intra- and extraoral review, the rehabilitation of each patient was decided on with different materials for comparison. The restorations were made using celluloid crowns.

*Conclusion:* While both ACTIVA kids and Cention N have adequate biochemical properties, we observed that the ACTIVA kids obturation material was easier to handle, and the different steps simpler, which reduced the time and the instruments required. This is an advantage, particularly considering the complicated handling in many cases of pediatric patients. In addition, this component of patented elastic resin is strong, durable and resistant to fractures. ACTIVA kids has all the benefits of glass ionomers and the esthetics, strength and durability of a composite.