

## Oral Communications

### CASE REPORTS

#### 1. COMPLEX DENTAL TRAUMA: TREATMENT PRIORITIZATION

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*Introduction:* Complex traumatic injuries force professionals to consider the principal injuries when establishing treatment priorities. Intrusive and lateral luxations represent one of the most serious situations in dental trauma. In the first situation there is axial displacement towards the interior of the socket, and in the second there is lateral displacement. As a result the periodontal ligament, the neuro-vascular bundle and the socket are flattened. Radiographically, in a lateral luxation there is an increase in the apical periodontal space, which cannot be observed in intrusive luxations. There is a high risk of complications, such as pulp necrosis, external inflammatory root resorption and substitution which conditions the therapeutic approach.

*Objectives:* To present a case of complex trauma and assess the different therapeutic options and prioritization when decision making.

*Material and methods:* The patient was an eleven-year-old girl who attended the Masters degree course at the Faculty of Medicine and Dentistry of the University of Valencia with a traumatic injury sustained three days previously.

The clinical and radiographic examination showed lateral and intrusive luxation of tooth 1.2 with a closed apex. The girl had an orthodontic apparatus which was partially removed. The treatment consisted in surgical repositioning and splinting over four weeks with a flexible splint.

Eight days after the surgical repositioning, the root canals were treated with calcium hydroxide, taking into account the risk of inflammatory root resorption and substitution.

The patient is currently under orthodontic treatment and there have been no complications.

*Conclusion:* Taking decisions before complex trauma depends on the injury, or total number of injuries, that has occurred, root development, the time elapsed from the traumatic injury and the effects that the trauma itself might have, and the treatment itself, with regard to getting the tooth back to its normal position in the dental arch.

#### 2. ORTHODONTIC EXTRUSION OF AN UPPER LATERAL INCISOR AFTER A ROOT FRACTURE

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*Introduction:* Root fractures tend to occur after a frontal impact. They occur very infrequently and normally in the upper front teeth of patients who are aged between 11 and 20. The diagnosis is reached after a clinical and radiological examination. Treatment as well as prognosis of these fractures will depend at what level of the root they are. In fractures of the mid-third, with considerable loss of bony support, the prognosis is unfavorable and suitable treatment would be extraction. In some cases, where aesthetics are important a treatment option could be the extraction of the coronal fragment, endodontic treatment of the apical fragment and orthodontic extrusion.

*Objective:* The objective of this work was to present the case of a root fracture of the middle third. Orthodontic extrusion was carried out that was aimed at recovering the alveolar bone and soft tissues.

*Material and methods:* The patient was a 15 year-old who presented two days after sustaining a traumatic frontal injury. During the clinical examination considerable mobility was observed of the crown of tooth 1.2. During the radiographic examination a root fracture could be observed by the middle third, and extraction of the tooth was decided on. When bone tissue loss was observed (and in order to avoid future aesthetic problems from the collapse of alveolar bone around 1.2 and, as a result, the modification of the anterior gum line) we decided to extract the coronal part and extrude the root part orthodontically.

After carrying out the extraction of the coronal part, we carried out a flap in order to locate the root remains. Endodontic treatment was carried out, and a screw joined to a metallic ligature was cemented. This reached an arch that was placed on the brackets of the anterior teeth of the patient.

Every two weeks the metallic ligature was activated and five months after the orthodontic extrusion, we observed that the tooth was exposed and there was great bone apposition in the more coronal area of the root.

*Conclusion:* Orthodontic extrusion can be an alternative to extraction in the case of middle third root fractures, as the results are aesthetically more favorable.

#### 3. ORTHODONTIC EMERGENCIES IN PEDIATRIC DENTISTRY. ANTERIOR CROSSBITE

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*Introduction:* Malocclusions according to the World Health Organization (WHO) take third place in dental care in our daily practice. Anterior crossbite is one of the most prevalent malocclusions. It is an intermaxillary anomaly that leads to disturbance in the anteroposterior and sagittal planes. With regard to the number of teeth involved, this may be total or partial and functional, aesthetic and psychological problems may be involved that require early treatment to avoid sequelae at a later stage.

*Objectives:* The increase in the prevalence of children with anterior crossbite attending the Pediatric Dentistry department of the Dental Clinic of the CEU-UCH made it necessary to study the application of new treatment methods for the early treatment of patients with this type of malocclusion. Our aim is to present a method for correcting anterior crossbite with the use of removable and aesthetic tooth aligners in patients with mixed dentition.

*Material and methods:* A literature review was carried out to analyze articles published between 2002 and 2012 that covered the different therapeutic strategies for anterior crossbites, and that evaluated the advantages and disadvantages of these appliances as opposed to treatment with Essix® plates. The cases are presented that were included in our research and that were aimed at verifying the efficiency of Essix® type aligners in crossbite treatment. To manufacture them, Essix® type A+ plates were used with a .040 mm width which were designed by Sheridan (Sheridan et al. JCO, 2004). The plates were reactivated every two weeks and the 1 mm composite stops were increased by reactivation. Crossbite correction was obtained over an 8 to 16 week period.

*Conclusions:* Crossbite in the primary dentition or in the first phase of mixed dentition can be treated successfully by using Essix® plates that have a success rate that is comparable to conventional treatment. For the patient there is an improvement in aesthetics, duration and comfort as well as cost.

#### 4. EARLY TREATMENT FOR POSTERIOR CROSSBITE. AN ALTERNATIVE TO THE FIXED APPARATUS

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*Introduction:* Guiding and developing primary and mixed dentition is a fundamental part of pediatric dentistry. Crossbite represents one of the most common occlusions in the dental office, and it should be treated promptly due to this leading to orthopedic instability, growth and facial development disorders, and then facial asymmetry. A correct diagnosis should therefore be made and treatment given as early as possible (as from 3-4 years).

*Objective:* To resolve crossbite cases by using a simple orthodontic method, with no orthodontic apparatus-

es, which will be used for preventative work, while seeking rehabilitation in form as well as in function.

*Material and method:* Various clinical cases are presented of patients who were aged between 3 and 6 years who had posterior crossbite. After carrying out composite tracks and selective filing we were able to solve the malocclusion, and function was restored.

*Conclusions:* Crossbite can and should be treated early, as from the age of 4 years, given the lack of difficulty of the technique, and it can be carried out over a short period. It requires limited apparatuses and very little cooperation by the patient and future skeletal, dentoalveolar, muscular, joint and aesthetic problem can be avoided.

#### 5. DELAYED ERUPTION OF UPPER CENTRAL INCISORS

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*Introduction:* On occasions, in the primary as well as in the permanent dentition some teeth are retained and they are late to erupt. The rate of embedded incisors is between 0.06% and 2% of the general population. The causes can be endogenous or local, and these include: lack of space, presence of supernumerary teeth or with tumor pathology, incisor malformation, prolonged retention or early loss of primary incisors, ectopic development of the permanent tooth germ and traumatic injury sequelae to primary incisors. The treatment in these cases is surgical-orthodontic, first obtain the necessary space in the dental arch and then to carry out a fenestration in order to traction the tooth and place in correctly into the dental arch.

*Material and methods:* First case: Eleven-year old patient. Clinically the absence of 11 could be observed, and 12 and 21 showed mesial inclination. Radiographically 11 showed retention and malformation.

Second case: Ten-year old patient with an unerupted 11 following trauma at the age of 4. 12 and 21 were in its place and a radiograph revealed it was embedded. In both these cases the lost space should be regained using a Hawley plate with springs.

Third case: The patient was a 15-year old with two retained upper central incisors. A radiograph revealed two supernumerary teeth which were extracted. In all three cases the procedure was the same; fenestration was carried out and a button was fixed to each tooth in order to bring it to its correct position in the dental arch by orthodontic traction.

Fourth case: Nine-year old patient with unerupted 11 and 51 in mouth. A radiograph revealed intrusion of 11. After removing the primary tooth we waited four months for the tooth to erupt. As there was no change we proceeded according to the previous cases.

*Conclusions:* In these situations carrying out an early diagnosis is important as a retained tooth can lead to a dentigerous cyst, root dilaceration and even psychological problems.

## 6. CASE REPORT OF A CHILD WITH SEVERE HEADACHES: MEDICAL HISTORY AND NEUROLOGICAL EXAMINATION

**Raigon C, Valencia C, Larena-Avellaneda J**

*Introduction:* Case report of a pediatric patient with severe headaches.

*Objective:* Clinical description and detailed explanation of the neurological examination.

*Materials:* Medical history of a pediatric patient with a severe headache. Anamnesis: Two months with pain in and behind right ear on waking up. Headaches. Pain increasing during the morning and at night, sometimes leading to disturbed sleep. Pain radiating towards eyes. Dizziness. Missing school due to headaches. Referred to neurologist by pediatrician who ordered a MRI. Two weeks later this was carried out and the patient was told if they found something they would call and to come back in July. She was sent to ENT specialist.

*Method:* Anamnesis, inspection, examination of cranial nerves, diagnosis and treatment.

Reflexes											
		V				VII		IX, X		IX, X XII	
Corneal	Light	Converg	Corneal	Light	Converg	Nasal	Palate	Nausea	Tongue		
		Right		Left		r	l	r	l	r	l
		+		+							
Sensitivity											
V		Skin on face				Mucosa		Tongue 2/3ant			
Branch	I	II	III	III	III			III			
Side	r	l	r	l	r	l	r	l	r	l	
Hypoafia			+		+						
Hypoalgesia			+		+						+

### Conclusions:

1. Sensitivity disturbances and cranial nerve reflexes should be analyzed in order to completely evaluate pediatric patients with severe headaches and in order to be able to study any clinical developments in these patients.

## 7. CASE REPORT OF A CHILD WITH SEVERE HEADACHES: MEDICAL HISTORY AND APPARATUS

**Valencia C, Raigon C, Larena-Avellaneda J**

*Introduction:* Case report of a pediatric patient with severe headaches.

*Objective:* Clinical description and detailed explanation of the apparatus.

*Material:* Medical history of the pediatric patient with severe headaches. Background: Diagnosed with migraine headaches four years previously, undergoing treatment by neurologist and admitted to the Maternal Child Hospital on the 14th March of 2008. The hospital report stated that: the child has been treated in our department for migraines initially with Flunazirine with no improvement and then with Ciprohepatarine with improvement. Four days ago while playing he lost consciousness, suddenly falling to the ground. No further data available because he was on his own. Three days previously he was playing with his sister and he had similar symptoms. His left leg started shaking, according to his sister "his eyes went white" and this lasted various minutes. He was assessed in the Emergency department by us and treatment was started with oxcarcepine. No further data available. He attended today after suffering just a few hours after this further attacks with similar characteristics, which were preceded by dizziness and blurred vision. Migrain. Recurrent vagal sycopes. Treatment recommended Nolotil, Trileptal sol. 10ml daily and Stesolid when losing consciousness. On 21.01.2010 he attended our Department complaining of headaches for a week that prevented him from sleeping and also of a lack of appetite, photophobia and otophobia. Romberg + Diagnosis: Migraine headache. Ibuprofene. Trileptal. He was given an interdepartment appointment with the Ophthalmologist on 12.02.10. The child then said the pain started at the back of his neck radiating to the back of his head, crown and forehead. He thinks he remembers that at the beginning it started in the temples and more on the rightside. It started daily and for two months. When he has the pain he feels "overwhelmed" and cannot lie down because his head "buzzes". He feels nauseous. He hears a whistling sound and noises in his right ear. Sometimes he wakes up feeling pain and on other occasions it increases over the day. Hypercuisis. The last bout had been in January with pain during the day and at night for two weeks.

*Method:* Anamnesis, inspection, examination, diagnosis and treatment with apparatus.

### Conclusions:

1. The results were effective after using an Equi-Plano apparatus

## 8. PROSTHETIC REHABILITATION IN PEDIATRIC DENTISTRY. CASE REPORTS

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*Introduction:* In pediatric patients, tooth integrity is closely related to the preservation of the functions of mastication, swallowing, speaking and aesthetics. Many etiological factors cause the premature loss of primary teeth, which is mostly related to: caries associated to inadequate dietary habits together with a lack oral hygiene, dental trauma from intrusive or extrusive luxations with considerable displacement and movement,

crown-root fractures that require extraction as with avulsions, among others.

*Case report:* Three care reports are presented of patients attending the Department of Pediatric Dentistry at the University Clinic of the International University of Catalonia:

—Female patient aged 4.7 years with external resorption of 5.1 and 6.1 due to traumatic injury suffered at the age of 2 years. Both teeth were extracted, a Nance button fitted, and the lost teeth replaced.

—Female patient aged 4.8 years, diagnosed with early childhood caries. The teeth that could not be restored were extracted and a removable acrylic partial prosthesis fitted with expansion screws.

—Male patient 6.7 years who presented with polycaries and multiple abscesses with fistulas. Restoration was carried out with two upper and lower acrylic partial prosthesis.

Periodic follow-up were made: at one week, two weeks, one month and every three months, in order to check how the child was adapting to the prosthesis, the eruption of permanent teeth and any possible variations in the adjustment of the prosthesis to the oral cavity.

*Conclusions:* Pediatric patients adapt well to prostheses, oral function can be restored and tooth stability is maintained. An area that should be highlighted is the emotional change observed in patients after aesthetic restoration.

## 9. EARLY TREATMENT FOR ANTERIOR CROSS-BITE. DIRECT TRACKS

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*Introduction:* Anterior crossbite is a sagittal malocclusion diagnosed in approximately 4-5% of children in the primary or mixed dentition which has a skeletal or dental cause. In some cases it can self correct during the transition period from primary to permanent dentition, although in most cases it should be dealt with promptly, upon diagnosis, in order to prevent skeletal anomalies.

*Material and methods:* Possible procedures for this early treatment that do not involve an orthodontic apparatus are, inclined resin planes, inverted metal crowns or direct composite systems. This last therapeutic option consists in the construction of inclined composite planes by the upper incisors, which permit the mandible to have a better sagittal relationship with the maxilla, in a short space of time.

*Case report:* The patient was aged three years and 11 months and he attended the Department of Pediatric Dentistry of the University Clinic of the University of Catalonia, with no relevant family or personal medical history, and no known allergy. The reason behind the consultation was the parents' concern for the anterior malocclusion of the patient, and the functional difficulty as a result. During the clinical examination a right and

left mesial step was observed together with anterior, canine to canine, crossbite.

The treatment consisted of direct composite tracks from the upper right lateral incisor to the contralateral incisor. In order to make these, preformed acetate crowns were made to fit the tracks properly and achieve a correct occlusion.

*Follow-up.* Controls were established at two weeks, one month and one year, together with the pertinent check-ups related to the exfoliation of the incisors. During the annual check-up considerable changes were observed intra- and extraorally, and function of the stomatognathic system was restored.

*Conclusions:* Direct composite tracks permit the correction of anterior crossbite in the primary dentition, leading to well-known functional and aesthetic changes. The advantages of the procedure should be kept in mind as it is economical for the patient, and more aesthetic than other methods. Less collaboration is required, they are easy to place and adjust according to the characteristics of each case, and parents are very satisfied.

## 10. GENETIC STUDY ON ANHYDROTIC ECTODERMAL DYSPLASIA. NEW TREATMENT POSSIBILITIES

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*Introduction:* Anhydrotic ectodermal dysplasia covers a heterogeneous group of abnormalities characterized by disorders that affect at least 2 or more tissues derived from the embryonic ectoderm layer such as skin, teeth, nails, sweat and sebaceous glands.

*Objective:* The aim of this work was to discover the type of genetic mutation that leads to anhydrotic ectodermal dysplasia, the clinical characteristics and disorders at an oral level, and to improve oral and aesthetic function using initially just a pediatric prostheses.

*Material and methods:* The case is presented of a girl who was receiving treatment from the age of four years and who is now aged 10. She has agenesis, conoid teeth, periorbital pigmentation, and very fine, fragile and unevenly distributed hair. A genetic study was carried out by the Institute of Medical Genetics, University Hospital of Wales, DNA was extracted from blood samples and using the PUREGENE equipment. For studying the mutations all the exons were of the gene EDA-A which were amplified by PCR. The PCR products were placed in a 1% agarose gel and they were then analyzed using the ABI Prism 310 for direct automatic sequencing.

*Conclusion:* We can confirm that it is an anhydrotic ectodermal dysplasia with a detected mutation in exon 12 (c. 1259 G > A; p.Arg420Gln). The patient is currently being treated for hypodontia with a pediatric prosthesis although the use of implants at an early age is being assessed.

## INVESTIGATION STUDIES

### 11. THE IMPORTANCE OF CHECK-UPS FOR PREVENTING DENTAL FEAR

**Lara A, Carrillo M, Crego A, Romero P, Romero M**  
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*Introduction:* Fear is one of the biggest reasons for avoiding dental treatment and it is mostly acquired during infancy. It is often related to traumatic experiences, many of these painful. Periodic check-ups that enable a child to have several dental experiences that are both positive and safe can contribute to progressive familiarization with events related to dental care, and small children can be “inoculated” against future dental anxiety. For example, previous investigations have found that children who participated in preventative programs showed a lower level of dental fear. According to these ideas, early visits to the dentist should therefore not be due to urgent problems, such as pain, trauma or caries, as first visits that are problematic can be due to dental anxiety developing in children. On the contrary, the frequent exposure to dental experiences could be a positive factor when trying to reduce the levels of anxiety in patients.

*Objectives:* To study the impact of periodic checkups on the development of child dental anxiety.

*Material and methods:* The sample was made up of 185 children (55.2% girls, mean age: 12.37 years). All the participants filled in a questionnaire that included dental anxiety measures (MDAS and DCQ). In addition, data was collected with regard to the frequency of visits, bad experiences, the number of previous dental visits before the bad experience, and the increase in fear after the bad experience. In order to analyze the data, basic descriptions were used together with bivariate correlation (Pearson's  $r$ ) and an analysis of multiple linear regression.

*Results:* Those children who had undergone an aversive experience at a dental office, but who had previous experience of many dental visits, had a lower level of fear after their bad experience and a lower number of negative thoughts, unlike patients who had hardly had any experience of a dental office.

*Conclusions:* Frequent asymptomatic visits appear to act in a prophylactic manner with regard to dental fear. Regular visits could provide an optimum climate for emotionally processing aversive events related to invasive dental procedures, and contribute to a reduction in potentially anxiogenic effects of a problematic dental visit.

### 12. ORODENTAL HEALTH STUDY ON CHINESE CHILDREN. THE GREAT UNKNOWN

**Aguilar B, Ruiz C, Andrea N, Lin C, Romero M**  
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*Introduction:* The regional community of Madrid has the second largest Chinese population in Spain. Over recent years their need for geographic, economic and social space has increased. Far from self-exclusion and ghettoization that is a characteristic of their language and culture, a gradual integration into our education and health system has been observed.

*Objectives:* To evaluate the efficiency of an orodental health campaign among the Chinese population.

*Material and method:* Contact was made with the Chinese Community in Madrid. Talks were given in schools and churches in both Spanish and Chinese which were aimed at parents as well as children. Guidelines were given on orodental hygiene and diet. Following this, intraoral and extraoral examinations of the children were made, and parents were given a report on the orodental health of their children.

*Results and discussion:* Sociocultural barriers stop the Chinese population from having access to better dental care. The carbohydrate content of their diet as well as the ignorance of parents regarding oral hygiene means that the Chinese child population has a high risk of dental disease. These campaigns can contribute to facilitating access to dentists by this population and to an increase in oral self-care.

*Conclusions:* The passing on of information regarding hygiene from parents to children is scarce, and diet is also a risk factor due to the high content of carbohydrates. Most of the Chinese children examined had rampant caries, bruxism, bad hygiene and class III malocclusion. The talks and the campaign were generally well received among the Chinese population.

### 13. FIRST DENTAL VISIT, REASON FOR THE CONSULTATION, AND BRUSHING FREQUENCY IN SCHOOL CHILDREN

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*Introduction:* Daily clinical practice indicates that the mean age for children to visit a pediatric dentist for the first time is much older than 3 years, or coinciding with the eruption of the permanent teeth. These figures contrast with those that are recommended internationally, that insist on the importance of the first dental consultation taking place before the age of one year. Given this problem, it is logical to ask ourselves how this situation can be reverted, and this was indeed how this study came about.

*Objective:* To determine by means of a survey the percentage of children aged 6-12 years who have visited a dentist, and to find out what is the most common consultation for the first visit, and to evaluate brushing frequency.

*Material and methods:* Five schools were randomly chosen in the city of Barcelona. The sample was made up of 385 children who were aged 6-12 years. A survey

was used to collect the data that included 14 items and which was structured as: visits to the dentist, oral hygiene habits and social and demographic characteristics. The data were analyzed with the statistical program Statgraphics® Plus version 5.1, using the Mann Whitney Test, Chi. Square and Anova simple.

**Results:** The results showed that 15.58% of the children had never been to the dentist at the age of 12 years, and there were no statistically significant differences between sexes. According to parents, 48.60% of children had been seen by a pediatric dentist. The most common reason for the consultation was for a checkup (53.21%) followed by caries 15.15% and 11.01% were referred by pediatricians. With regard to oral hygiene habits, parents reported that 60% of children brushed their teeth more than once a day. Most only used toothpaste and 41.21% used fluoride rinses. Among the variables studied only statistically significant differences were found between the relationship between district and reason for consultation ( $P < 0.01$ ).

**Conclusions:** A high percentage of children in our study had visited the dentist. However, the level of concern regarding the importance of the first dental visit continues to be low among the parents of children in the city of Barcelona, as most children visited a dentist at the age of 6 years, either due to a lack of knowledge or because establishing preventative dental care at an early age was not considered important.

#### 14. IN VIVO STUDY OF THE EFFECT OF SELF-ETCHING RESINS IN CARIES PREVENTION

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**Introduction:** Pit and fissure caries have a high prevalence in the population, especially in the child population. This occurs because of their anatomy and narrowness which makes them particularly prone to the accumulation of bacterial plaque and the remains of food, which turns them into a high cariogenic risk area. For several years now many techniques have been used to avoid the appearance of caries in this area: pit and fissure sealants, the use of fluoride, improvements in nutritional state and an improvement in dental hygiene which has allowed the incidence of caries to be reduced over the last decades in industrialized countries.

**Objective:** to study the efficiency of self-etching resins as a material for pit and fissure sealants for molars, as opposed to the classic resins that have been used with acid etching or with self-etching adhesive.

**Material and method:** We analyzed 1089 molar sealants in children aged 6 to 16 years who were divided into 4 groups. The sealants in child number 1, were placed in the following way: In molar 1.6: group A: Acid etching + Helioseal®. In 2.6: group B Adhese One F® + Helioseal®. In group 3.6: group C: Prevent seal®. In 4.6: group D: Vertise flow®. As from child number 2 the materials were moved one position. The clinical evaluation of the treatment was made at 0 and 3 months. The controls were always carried out by the same dentist. We quantitatively evaluated the presence or absence of

the pit and fissure sealants and, if affirmative, the direct clinical evaluation of van Dijken from 1986 was used, which in addition includes evidence of caries, marginal adaptation and discoloration, sealant color, anatomic shape and surface roughness. In order to study the significant differences between the results, contingency tables using the chi-square test were carried out.

**Results:** Adhese ONE F + Helioseal offered the best results, and the traditional method for sealing was superior (group A). In addition, with regard to the materials commercialized such as self-etching sealants, the best results were obtained with Vertise Flow.

**Conclusions:** The new self-etching sealants do not increase the efficiency of pit and fissure sealants that require previous acid-etching, either with orthophosphoric acid or with adhesive.

#### 15. PROPOSAL FOR A PROTOCOL ON ORAL HEALTH PREVENTION IN PRESCHOOLERS

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**Introduction:** The prevalence and severity of caries as well as oral disorders derived from non-nutritious habits in preschoolers continue to be of concern to pediatric dentists. We consider that the key reasons in this problem are: the absence of early dental care for children in the public health service, socioeconomic level and the lack of information for parents on oral health.

**Objective:** To discover how much knowledge mothers have on oral hygiene, at what point the first visit to the pediatric dentist takes place, and if they receive oral health information during pregnancy. To find out the current levels of disease and the risk factors in our control and disease groups. To develop a prevention protocol for parents that would ensure universal, integral and accessible health coverage.

**Material and method:** A survey that contained three questions was directed at mothers of boys and girls under the age of 7. A clinical examination and data collection was carried out regarding the eating habits and oral hygiene of healthy preschoolers who attended the Department of Pediatrics of the CAP Florida Norte (Hospitalet de Llobregat) and the Bellvitge Dental Hospital (Barcelona), between the period of November 2011 and February 2012.

**Results:** The surveys carried out on 100 mothers revealed that: 26% feel that oral hygiene should start at the age of 2 years, another 26% at 3 years and 14% at 6 months. With regard to the first visit, 22% felt that 3 years was the ideal time, 18% between the ages of 5-6 years and only 5% during first year of life.

Some 97% had not received information during their pregnancy or during the postpartum period on oral health care in babies, and 3% had received information in another country.

The control group (45) had a caries prevalence of 15.5%. Oral hygiene was carried out in 75% of cases and the mean age to start brushing was at 1 year and 7 months. In 26% of cases it was carried out autonomously.

*Conclusions:* In the present study it was found that mothers had a lack of knowledge on the oral health care of their children, that the caries index was high, and that hygiene habits were established late. This reveals the need to motivate and train parents on subjects related to oral health early on. Prenatal education is therefore fundamental, and a key role in this should be given to midwives and pediatric nurses.

## 16. THE EFFECT OF ONCOLOGICAL TREATMENT ON THE DENTAL AGE OF CHILEAN ONCOPEDIATRIC PATIENTS

**Pérez MA, Fierro C, Fernández E, Brunotto M**

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*Introduction:* In Chile cancer is the second most common cause of death, which is consistent with world statistics on this disease. Irradiation and chemotherapy used in the treatment can affect the normal development of the individual. The scientific literature has described disorders in dental development in children in relation with oncological treatment. Estimates on the physiological age of children submitted to antineoplastic treatment based only on chronological age will lead to errors which will lead to an underestimation of the disorders that can arise during development.

*Objective:* The objective of this study was to evaluate the effects of cancer treatment on the dental age of pediatric oncological patients.

*Material and methods:* a cross-sectional preliminary study was carried out of pediatric patients (n = 13) of both sexes who were seen by department of Child Oncology of the Hospital Regional Guillermo Grant Benavente in the city of Concepción Chile. The clinical dental and medical characteristics were evaluated. Dental age was determined using a panoramic radiography in which all the teeth were evaluated of the lower left arch according to the Dermijian methods with regard to chronological age, given the clinical medical register.

*Results:* 61% of the patients were females, approximately 60% had sizes that were the same or larger than the 25th percentile, and 53.8% had a larger weight than the 50th percentile. It was observed that in 46% of the children there was no concordance between dental and chronological age.

*Conclusion:* Bearing in mind that growth is a complex biological phenomenon, these preliminary results allow us to conclude that oncological treatment probably affects dental development, and that other medical and sociocultural variables should be included.

*Finance:* Proyecto DIUC N° 210.104.006-1.0 Universidad de Concepción Chile.

## 17. CONCENTRATION OF MINERALS IN PRIMARY TEETH OF PREMATURE NEWBORN BABIES

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*Introduction:* Premature births are a public health problem in Spain. The rate has increased over the last decade. Low weight or preterm babies have a higher prevalence of structural defects of the enamel.

*Objectives:* To quantify the mineral concentration/composition of primary teeth in full-term and pre-term newborn babies.

*Material and method:* A total of 60 pre-term or low-weight children were studied (< 2,500 g) together with 60 full-term babies who had weighed over 2,500 g. The mineral content of 25 teeth was analyzed and compared to 30 in the control group. All the teeth were lower central primary incisors.

*Results:* There were significant differences (p < 0.05) in the mineral content of calcium, selenium and iron, among the teeth analyzed in both groups, but with regard to antioxidant minerals, copper, zinc and magnesium there were no significant differences.

*Conclusions:* The group of preterm children had mean values that were lower than those of the control group with regard to the four minerals: calcium, selenium, phosphorus and iron.

It would seem from the results obtained that being premature could possibly cause low mineralization of primary teeth when compared to full-term babies, and it remains to be seen if there are similar consequences in the eruption of the first permanent teeth.

## 18. PORTUGUESE CHILDREN WITH DOWN SYNDROME. CARIES PREVALENCE AND SALIVARY COMPOSITION

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*Introduction:* Children with Trisomy 21 (T21) have various oral health disorders. The development of caries requires the presence of sugars and microorganisms but it is also influenced by the susceptibility of the tooth, profile of the microorganisms and saliva quantity and quality. Saliva is important for controlling microbial plaque and in the pathogenesis of caries due to individual characteristics and to the close relationship with enamel. In other words, it is an essential element for developing or preventing this pathology.

*Objectives:* This research was aimed at comparing the presence of caries and its relationship with Streptococcus mutans, Lactobacillus and Candida, as well as salivary flow, pH and the secretion of IgA, amylase and some ions, in children with T21 and their brothers and sisters (controls).

*Material and methods:* A total of 90 children were evaluated: 45 had T21 and another 45 had brothers and sisters of a similar age (control group). A dental examination was carried out, a questionnaire filled in and saliva collected. The results are presented as means  $\pm$  pattern deviation.

*Results:* The T21 group had a mean age of  $12.7 \pm 4.0$  years and 49% were males. The control group had a mean age of  $12.8 \pm 3.7$  years and 60% were males. The

DMF index in the T21 group was  $1.02 \pm 2.42$  as opposed to  $1.84 \pm 3.13$  in the control group: 78% vs 58% ( $p = 0.042$ ). There was a simultaneous reduction of *Streptococcus mutans* in the saliva of the T21 group ( $p = 0.026$ ). The number of *Lactobacillus* and *Candida* did not show any variation between the two groups. In addition, the children with T21 showed a reduction of 37% of salivary flow ( $p = 0.046$ ) and 29% in IgA secretion but without statistical significance, and differences in saliva pH values did not arise.

Saliva concentrations of calcium, potassium, amylase, iron, sodium, chorine, phosphorous and total proteins did not show any statistical differences either between the groups.

**Conclusions:** The children with T21 had a lower prevalence of caries, which can be associated with a greater parental concern for oral health, as they visited a pediatric dentist sooner, on observing bruxism, delayed eruption, diastemata, and to the lower number of *Streptococcus mutans* in saliva.

## 19. SOCIOCULTURAL AND BEHAVIORAL FACTORS AND EARLY CHILDHOOD CARIES (ECC)

**Fierro C, Pérez MA, Bravo L, Brunotto M**

*Universidad de Concepción, Chile. Universidad de Córdoba, Argentina*

**Introduction:** A limited number of investigations have tried to study the impact of socio-emotional factors in the quality of life of children with early childhood caries, advanced have not been made with regard to determining the causal relationship between these factors and early childhood caries.

**Objective:** The objective of this study was to evaluate the presence of early childhood caries associated to socio-cultural and behavioral characteristics in children aged between 3 and 5 years who were seen in the Family Health Centers of the Concepción Commune, Región del Bío Bío, Chile.

**Material and methods:** A cross-sectional observational study was carried out of children ( $n = 152$ ) of both sexes who were aged 3 to 5 years and who attended Health Centers of the Municipio de la Comuna de Concepción and who belonged to the welfare system Fondo Nacional de Salud. The clinical, environmental and psycho-socio-cultural data were registered in the Historia Clínica y Encuesta de Comportamiento (Clinical history and Behavior survey). The association between variables was analyzed using the exploratory multivariate method of correspondence analysis.

**Results:** The population was made up of 54% boys and 46% girls. Some 55% of the children surveyed had behavioral and socio-emotional problems. 82% of the children had DMF teeth  $> 0$ , with a mean value of 5 caries per child. It was observed that the male children with behavioral problems had more caries.

**Conclusion:** The examination of the association between the variables studied show that while the presence of caries was high among the Chilean population of children aged 3 to 5 years, their conduct can influence this oral pathology being present.

*Finance: Proyecto DIUC N° 211.104.007-1.0 Universidad de Concepción Chile.*

## 20. COMPARISON OF BONDING STRENGTH IN ANIMAL AND HUMAN DENTIN

**Gómez T, Muñoz D, López L, Pérez A, Ortiz AJ**

*Universidad de Murcia*

**Introduction:** The use of human teeth as a substrate for carrying out experiments is conditioned by the extraction of healthy teeth for therapeutic reasons, which is extremely difficult given that carious lesions or other defects are what determine dental extraction.

We currently dispose of alternative sources derived from the meat industry such as bovine, swine or ovine teeth. However, in the scientific literature there is controversy with regard to the use of these substrates.

**Objectives:** To compare the adhesive behavior of a material on cow, pig and sheep dentin, that is submitted to the forces of shears with respect to human dentin.

**Materials and methods:** The dentin of the four groups was studied under the same conditions: human ( $n = 20$ ), bovine ( $n = 20$ ), swine ( $n = 20$ ) and ovine ( $n = 20$ ). The vestibular surface was prepared until the dentin of each specimen was reached. The adhesive was placed according to the instructions of the manufacturer (Solobond M Voco®) and composite was added (Grandio Voco®) in cylinders with a 3cm diameter with an increment of 2mm. The roots of the specimen were submerged into a type IV plaster cylinder. After remaining submerged for 24 hours in distilled water at 37°C, a shearing test was carried out with a load of 1000 N and a piston rod with a 30° bevel. The data obtained in Newtons (N) was transformed into Megapascals (MPa) by dividing the contact surface of the composite cylinders. The statistical analysis was carried out using an ANOVA variance analysis and the multiple comparison Tukey test ( $p < 0.05$ ). An analysis of the interphase was carried out using a scanning electron microscope.

**Results:** The adhesion values obtained from the bovine dentin (13,9MPa), swine dentin (15,8MPa) and ovine dentin (12,2MPa) showed significant differences with regard to the human substrate.

**Conclusions:** Although the controversy regarding the use of non-human animal substrate has not been clarified, there are various studies that corroborate the lack of adhesion of bovine dentin with regard to human dentin.

It can be observed from our study that none of the substrates under study, which were bovine, swine or ovine dentin, are suitable as an alternative to the use of human dentin for in vitro shear strength studies.

## 21. MARGINAL MICROFILTRATION OF DIFFERENT ADHESIVES IN CLASS II CAVITIES; EFFECT OF THE APPLICATION OF A HYDROPHOBIC RESIN

**Jiménez R, Cortes O, García C, Martínez MD, López M**

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**Introduction:** The use of aesthetic restoration materials has increased over recent years as a result of improvements in adhesive systems. Bonding is fundamental for achieving the correct adaptation of the material and for a good marginal seal. In 1955 Michael Buoncuore introduced the technique of acid etching, and from then on the characteristics of adhesion systems have improved, with better clinical results and a simplification of the technique into several steps. However, even today, one of the problems is the appearance of postoperative sensitivity and the microfiltration of microorganisms, especially in Class II cavities.

In order to resolve these problems, modifications were carried out in the clinical adhesion protocol, such as applying many layers, increasing the evaporation of the solvent...., or as suggested by some authors, applying a layer of hydrophobic resin for improving marginal adaptation and the mechanical properties of the materials.

**Objectives:** To compare marginal microfiltration of composite restorations in Class II cavities according to the adhesive, and when adding a layer of hydrophobic resin.

**Materials and methods:** For this, 45 human premolars were used that had been extracted for orthodontic purposes and Class II cavities were made. Following the instructions of the manufacturer the different adhesives (Prime & Bond NT® (Dentsply) Xeno V+® (Dentsply) and Excite F DSC® (Vivadent) were applied, and in turn the experimental groups were established in which, after the application of the adhesive, a layer of hydrophobic resin was applied (Heliobond® (Vivadent). The samples were prepared and after being immersed in 1% methylene blue, they were sectioned and evaluated using an optic microscope. The results between the different groups were compared and analyzed using a statistical method.

**Results:** Among the adhesives there were no significant differences. The use of intermediate hydrophobic resin improves the adaptation of the materials.

**Conclusions:** The use of hydrophobic resin can improve the adaptation of the materials.

## 22. ANIMAL ALTERNATIVES TO HUMAN ENAMEL IN ADHESION STUDIES

**Muñoz D, Gómez T, López L, Serna C, Ortiz AJ**  
*Universidad de Murcia*

**Introduction:** Rapid developments in the materials used in the field of dentistry, makes the need for comparative studies increasingly urgent as clarification is needed on the properties and improvements of each new material with regard to its predecessor.

*In vitro* studies are used as a starting point before more in-depth studies are carried out. However, the difficulties and restrictions in obtaining human teeth in a perfect state, without caries or fillings or even with wide flat surfaces, have led to the search for alternatives and substrates such as animal teeth (cow, pig or sheep) of which there is an abundance.

**Objectives:** To compare the resistance of a single material to the shear strength when applied to human, bovine, swine and ovine enamel.

**Materials and methods:** A total of 80 specimen were studied in 4 groups: human (n = 20), bovine (n = 20), swine (n = 20) and ovine (n = 20). A vestibular surface was prepared of enamel in each specimen. The adhesive was placed according to the indications of the manufacturer (Solobond M Voco®) and composite (Grandio Voco®) was added in cylinders with an increment of 2mm. The roots of the specimen were submerged in Type IV plaster cylinders. After 24h submerged in distilled water at 37° C, a shear strength test was carried out with a load of 1000 N and a piston rod with a 30° bevel. The data obtained in Newtons (N) was transformed into Megapascals (MPa) by dividing the contact surface of the composite cylinders. The statistical analysis was carried out using variance analysis (ANOVA) and the Tukey multiple comparison test (p < 0.05). An interface analysis was carried out with a scanning electron microscope.

**Results:** The adhesion values obtained with human enamel (25.8 MPa) did not show significant differences with regard to the data obtained from the bovine (22.5 MPa) and ovine (30.9 MPa) substrates. However, the values of swine enamel (10.7 MPa) did show significant differences with regard to the values of human enamel, and they were clearly inferior.

**Conclusions:** Our results suggest that the incisors of both cows and sheep could be used to substitute human enamel in shear strength vitro studies. Nevertheless, it should be highlighted that the flattened vestibular anatomy and the large size of bovine incisors, have an added advantage with regard to handling.

## 23. COMPARATIVE STUDY BY MEANS OF X-RAY DIFFRACTION BETWEEN HUMAN/BOVINE TEETH

**Teruel J, Cabezuelo MI, Hernández A, Alcolea LA, Ortiz A**  
*Universidad de Murcia*

**Introduction:** Given the difficulty that exists in finding human teeth for “in vitro” studies on the behavior of restorative materials, the search for teeth of another species that are easy to obtain and that show similar behavior is becoming increasingly important. Many authors claim that bovine teeth are the most suitable substitutes for human teeth, in adhesion studies.

**Objective:** The objective of our study was to compare by means of X-ray diffraction the enamel composition of human and bovine enamel and dentin.

**Material and methods:** Human caries-free teeth and bovine teeth were used. Using a diamond bur the enamel and dentin was separated, and the calculus, stains and pulp eliminated. The enamel and dentin were manually pulverized in an Agate mortar. The powder was processed in order to detect its composition using X-ray diffraction.

**Results:** The graphs obtained show a maximum peak of 3800 of hydroxyapatite quantum for human enamel and maximum peak of 2200 quantum for bovine enamel.

Moreover, with regard to dentin, the graphs showed a maximum peak of 1070 hydroxyapatite quantum for

human dentin and a maximum peak of 1730 quantum for bovine dentin.

**Conclusions:** Those adhesives that use an acid-based reaction for achieving a direct chemical union with a tooth, obtain greater bonding strength for human enamel than bovine enamel, and a greater bonding strength for bovine dentin than human dentin, as it is directly proportional to the quantity of calcium with which the adhesive can react.

## 24. MORPHOLOGICAL COMPARISON BETWEEN ENAMEL AND DENTIN OF HUMAN/BOVINE SPECIES

**Cabezuelo M, Teruel J, Hernández A, Martínez E, Ortiz A**

*Universidad de Murcia*

**Introduction:** Current studies on bonding play a fundamental role in the progression of dentistry, particularly Pediatric Dentistry. Although human teeth are ideal for this, it is difficult to dispose of sufficient human teeth that are in good condition, and for this reason bovine teeth are used as substitutes.

**Objective:** The objective of this study was to compare the morphology of dentin in the human and bovine species. For this we will aim to establish, or not, an equivalent/conversion, and we aim to be able to compare properly the results from the adhesion studies that have already been carried out by other authors.

**Material and methods:** Ten human teeth and 10 bovine teeth were used. They were cleaned, organic remain removed, and they were conserved in thymol. Longitudinal, coronal and root slices were then carried out with diamond discs. The surfaces of the slices were then polished with a sofex polishing disc of 30-50 $\mu$ m (3M, ESPE, MN, USA) and they were etched with 37% orthophosphoric acid, cleaned with water for ten seconds and then air-dried for 20 seconds. Lastly, the slices were introduced into distilled water and placed in an ultrasound bath for 30 seconds to eliminate the remains of any dental powder.

The samples were placed on a slide and they underwent a procedure to cover them in gold with a sputtering system used with an evaporator (Thermo V6 Scientific, Bio-Rad). Once the samples had been prepared, they were viewed with a scanning electron microscope with a magnification of 2000. The images obtained were analyzed with the image processor Leika Q-win. In order to detect a significant difference the Kruskal-Wallis test and Dunn's multiple comparison test were used.

**Results:**

**TABLE I**

Number of tubules per area of 2556.7 ( $\mu$ m <sup>2</sup> )	Mean area of the tubular section ( $\mu$ m)
80	4.76 $\pm$ 0.12
90.75	2.24 $\pm$ 0.07
63.15	3.1 $\pm$ 0.06
88.33	1.5 $\pm$ 0.06

Coronal human dentin	80	4.76 $\pm$ 0.12	*p < 0.001 with regard to coronal bovine	+ p < 0.001 with regard to coronal human
Coronal bovine dentin	90.75	2.24 $\pm$ 0.07		+ p < 0.001 with regard to bovine root
Root human dentin	63.15	3.1 $\pm$ 0.06	*p < 0.001 with regard to bovine root	
Root bovine dentin	88.33	1.5 $\pm$ 0.06		

**Conclusion:** When interpreting the results of the dentinal adhesion studies that use bovine teeth, we should keep in mind that the quantity of tubular and intertubular dentin and the diameter of the tubules, differs significantly with regard to those of humans, at both crown and root.

## 25. STUDY ON THE CLINICAL PERFORMANCE OF AESTHETIC CROWNS IN PRIMARY MOLARS

**Martí S, Virolés M, Mayné R, Guinot F, Lorente A**

*Departamento de Odontopediatria. Universitat Internacional de Catalunya*

**Introduction:** Metal crowns have, for many years, been considered the ideal restoration material for primary molars, but they have a great disadvantage which is their aesthetics. Today there is an increase in demand by parents for restorations that are more aesthetic.

**Objective:** To determine and compare the retention, wear resistance, gingival health and satisfaction of parents after placing preformed metal crowns and preformed metal crowns with an aesthetic facing in primary molars after a period of 20 months.

**Material and methods:** The sample was made up of 14 primary molars of patients who had visited the university dental clinic of the International University of Catalonia. Each patient was randomly fitted with both types of crown. The control group (metal crowns) was made up of a sample of 7 molars, and the experimental group (aesthetic crowns) was made up of a sample of 7 molars.

After being placed, the crowns were clinically and radiographically evaluated at 3, 6, 12 and 20 months. Gingival health was also monitored together with marginal adaptation, the existence of fractures in the aesthetic part of the crowns as well as retention. A questionnaire was also given to parents to evaluate their satisfaction. For the statistical analysis an ANOVA multifactorial test was carried out and p < 0.05 was considered a statistically significant value.

**Results:** The results indicate that parents were very satisfied with the aesthetic crowns. Statistically significant differences were not observed with regard to marginal adaptation and retention for both types of crowns (p < 0.05), but there were differences with regard to gingival health (p < 0.01).

*Conclusions:* Aesthetic crowns combine the durability of conventional metal crowns, improving their aesthetic appearance, but long term studies are necessary with a greater sample number in order to evaluate gingival health and clinical success.

## 26. BIOCOMPATIBILITY OF HYALURONIC ACID. AN ALTERNATIVE PULPOTOMY AGENT

**López A, Cortés O, García C, Magán R, Castejón I**  
*Unidad Docente de Odontopediatría. Facultad de Odontología. Universidad de Murcia*

*Introduction:* The objective of pulpotomies in primary teeth is to preserve root pulp and avoid inflammation. Up until now many agents have been used. The use of aldehydes such as formocresol is widely questioned, and ferric sulphate and mineral trioxide aggregate are the most accepted. The advances in biomedical investigation have favored the development of new materials that can help to regenerate the dentin-pulp complex. Hyaluronic acid is a polysaccharide of the glucosaminoglycan type, and it has been demonstrated that it has anti-inflammatory, anti-edematous and anti-bacterial effects, and for this reason it could be considered as a topical application agent for pulpotomies.

*Objectives:* The aim of this study was to evaluate the cytotoxicity of Hyaluronic acid (Afta Med<sup>®</sup>). For this a fibroblasts cell culture L929 was used, and viability was determined using an MTT assay, in order to compare it with the positive and negative control.

*Conclusion:* Hyaluronic acid could be an alternative agent for pulpotomies. Histological and clinical studies are required that permit evaluating pulp response to this material.

## 27. MEDICATION-FREE PULPOTOMIES

**Delgado C, Martínez N, Moya M, Hontecillas V**  
*Hospital San Rafael*

*Introduction:* Ever since Buckley first discovered the pulpotomy technique in 1904, formocresol has been one of the most used medicines for this. However, this product has a series of adverse effects that has made it necessary to look for new materials that offer an alternative which is both safe and efficient.

*Objectives:*

—To preserve the integrity, health and function of the teeth treated and of their supporting tissues, although their complete vitality cannot be preserved.

—To evaluate if a medication-free pulpotomy technique for primary molars could be an alternative to the use of formocresol.

—To ascertain clinically and radiologically the absence of any pathologic pulp response.

*People, material and method:* The sample was made up of 152 patients, who underwent medication-free pulpotomies in the department of pediatric dentistry of the San Rafael Hospital in Madrid. The materials and

methods used were: Anesthesia and isolation with rubber dam; elimination of carious tissue with a high-speed rotary instrument and a round bur, opening up and removal of the tissue of the pulp chamber that had been affected, compression and control of pulp hemorrhaging with sterile cotton balls. The chamber was washed and the root canals opened with sterile cotton pellets soaked in physiological serum, examination of the complete pulp chamber floor. The cavity was dried with cotton and the zinc-eugenol oxide cement was mixed on a glass slab with a metal spatula according to the instructions of the manufacturer. The material was placed and adapted to the wall and floor of the pulp chamber with a metallic spatula or cotton soaked in water. A permanent reconstruction was carried out of the tooth treated with silver amalgam or with a preformed crown.

*Conclusions:* On submitting this summary the study had still to be completed and definitive results and conclusions cannot therefore be presented at this point.

## 28. DOES THE FEAR AND ANXIETY OF PARENTS AFFECT OUR PEDIATRIC PATIENTS?

**Rodas CJ, González Y**  
*Universidad de Barcelona*

*Introduction:* Anxiety is a response to situations in which the source of the threat is ill-defined. Childhood fears are very common and it is known that the object of these fears is related to development phases, through a direct or indirect way (model, information). The general symptoms of anxiety in children in the literature are scarce, and the etiology is still unknown.

*Objectives:* To evaluate fear and anxiety of parents and healthy children who visit a dental clinic for the first time. To evaluate if there is a relationship between the fear and anxiety of parents with the fear and anxiety of children.

*Material and method:* Prospective study. Population: Healthy children aged 5-12 years who for the first time visited the dental clinic of the Master's degree course of pediatric dentistry of the University of Barcelona and their parents. Period: November 2011 to March 2012. Type of survey, anxiety levels: Parents: Scale of dental anxiety, Corah and fear levels (CFSS-DS). Children: Venham picture test. Only one survey taker. Parents were asked to answer two surveys in order to assess the level of fear and anxiety so it could be related to the level of fear and anxiety that their children could have.

*Results:* Dental anxiety scale (Corah): A total of 60.22% of parents had low levels of anxiety, followed by 31.81% who had moderate anxiety, 5% no anxiety, 2.27% high levels of anxiety. CFSS-DS: 5.68% had high levels of fear; 15.90% reported no fear; 9.09% reported fear, and 69.31% a little fear. Venham Picture test: 46.80% of the patients had felt anxious 4 times during the first visit to the dental clinic of the master's degree course in pediatric dentistry; 12.76% of the children had high levels of anxiety, and reported having felt anxious 8 times. The remaining patients were distributed according to the following: 14.89% anxious once; 12.76% twice; 6.38% five times; 4.24% six times; 2.12% seven times.

*Conclusions:* Despite that many investigations link parental anxiety and fear with that of their children, our study shows low levels of anxiety in both parents and children. There was no significant relationship between children with high anxiety levels and their parents.

## 29. APICOFORMATION WITH MINERAL TRIOXIDE AGGREGATE (MTA), A SERIES OF CASES

**González E, Villalón G, Gutiérrez N, Iglesias A, Mendoza A**

*Universidad de Sevilla*

*Introduction:* When root formation is interrupted because of pulp necrosis this represent a therapeutic challenge, not because of the fragility of the root canal walls, or the divergence in the apical third, or because apex closure formation is impossible, but because conventional treatment with calcium hydroxide requires extensive time and a commitment by the patient and their parents.

*Objectives:* To present a series of cases of upper necrotic central incisors as a result of trauma and in which the apex was closed using mineral trioxide aggregate (MTA).

*Material and methods:* The sample was made up of 18 patients who underwent clinical monitoring [pain on percussion and color. Pain on percussion was scored as either positive or negative, and color treatment of the tooth was rated as 0-2 (0: crown normal color, 1: minor discoloration, 2: considerable discoloration) and radiologic (degree of root formation, presence of image of apex and size of image. The degree of root development was classified according to Nolla's stages (from 0 to 10, with 0 being the absence of crypt and 10 completed apical end of root). The presence of image and size using the P.A.I index 0-4 (0 intact periapical bone structure, 1 periapical radiolucency diameter of 0.5-1 mm, 2 periapical radiolucency diameter of 2-4 mm, 4 periapical radiolucency diameter of 4-8 mm and 5 periapical radiolucency over 8 mm) ] at 1 month, 3 months, 6 months and once a year for a period of five years.

*Results:* Of the 19 teeth treated, 100% of the cases were successful as there was a reduction of the P.A.I. index when assessed radiographically as well as a path in the bone lamina of the surrounding tissue.

*Conclusions:* MTA represents a valid therapeutic option for the apexification of permanent immature teeth with considerable reduction in the final treatment time.

## 30. CLINICAL/RADIOGRAPHIC COMPARISON OF DIFFERENT DRESSINGS FOR PRIMARY MOLAR PULPOTOMIES

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*Departamento de Odontopediatría. Universitat Internacional de Catalunya*

*Introduction:* Formocresol (FC) has been considered for many years as the "gold standard" for pulp dressing.

Nevertheless, due to the controversial properties of formaldehyde as a component of formocresol, other materials have been proposed as alternatives: Ferric Sulphate (FS), Mineral Trioxide Aggregate (MTA) and Sodium Hypochlorite (NaOCl). Currently there is not enough evidence to establish the superiority of a material for carrying out pulpotomies in primary molars due to the lack of quality scientific studies.

*Objective:* The aim of this study was to evaluate and compare the clinical and radiographic results of MTA, SF, FC and NaOCl as a pulp dressing to be used in pulpotomies of human primary molars over a period of 24 months.

*Methods:* 100 primary molars of 81 children were treated using the conventional pulpotomy technique with one of the three experimental materials (MTA, SF and NaOCl) or with the control group (FC), that were randomly assigned. Clinical and radiographic monitoring was carried out every 6 months for a period of 24 months. Fischer's Exact Test was used for the statistical analysis and  $P \leq 0.05$  was considered a statistically significant value.

*Results:* The total success rate for the groups with MTA, SF, FC and NaOCl was 96,5%, 98%, 97,5% and 85%, respectively after a follow-up of 24 months. There was one molar (Group NaOCl) with clinical failure after 18 months of monitoring and one molar (SF Group) with clinical failure after 12 month of monitoring. Nevertheless, statistically significant differences were not observed between the different materials, with regard to clinical success ( $P > 0.05$ ). With regard to radiographic evaluation, internal resorption was the most common finding (7%). Statistically significant differences between the groups were observed with regard to radiographic success after 24 months of monitoring ( $P = 0.303$ ).

*Conclusions:* The clinical and radiographic results in the four groups of the study were similar at 24 months. Statistically significant differences were not found between the clinical and radiographic failure rates between groups.

## 31. CLINICAL STUDY ON PULPECTOMIES

**Paz M, Muñoz L, Torres L, Moreno MP**

*Universidad Europea de Madrid*

*Introduction:* Pulpectomies of primary teeth consist in completely removing and eliminating all the pulp tissue with the aim of reducing the bacterial population of the contaminated pulp, and obtaining a clean and healthy root canal. It should be kept in mind that for this to be a success, root length should be the same or greater than 2/3 and there should be no advanced external resorption. In the literature different indications are reflected such as permanent pain over a long period, percussion sensitivity, hyperemia even after a pulpotomy, post-trauma pulp necrosis in the anterior region or due to extensive caries in the primary second molars before the eruption of the permanent first molar; excessive hemorrhaging or necrotic content after pulpo-

tomies, periapical abscesses with small radiolucent areas that are visible on radiographs.

**Objectives:** Based on this, the objectives for this study were: 1) to discover the prevalence of pulpectomies carried out on the patients who attended the Master's degree course on pediatric dentistry of the UEM over the years 2010-2012. 2) To evaluate the most common causes and the incidence rate in the different primary teeth. 3) To determine if these pulpectomies were diagnosed before, during or after the intervention. 4) To evaluate if they arise more commonly in females or males.

**Material and method:** An extensive review was carried out of the medical histories of patients who attended the Master's degree in pediatric dentistry of the UEM between 2010-2012. The causes for deciding on this treatment were assessed, as well as the rate, prevalence and dental involvement.

**Conclusions:** We would like to highlight that the most common cause of pulpectomies is: In the anterior region, post-traumatic necrosis, with greater involvement of the upper primary incisors. And in the posterior region, it is large carious areas with furcal involvement and abscesses, mainly affecting primary second molars.

### 32. PULP RESPONSE TO MTA AND $\beta$ -TCP IN PULPOTOMIES

**Alcaina A, Guerrero J, Ortiz E, Ortiz C, Ortiz AJ**

**Introduction:** Pulpotomies helps to maintain the integrity of the dental arches preserving those teeth that would otherwise be destined for extraction. Numerous agents were used for the pulpotomies. Up until now, the clinical and radiographic results of mineral trioxide aggregate (MTA) have been very favorable. The problem with MTA is its high cost, and the search goes on for new materials. Tricalcium phosphate  $\beta$ -TCP) is a ceramic, biocompatible material that stimulates bone growth and that could be used as pulpotomy material.

**Objectives:** To assess pulp response in rat's teeth when  $\beta$ -TCP is used as a pulpotomy agent and to compare the histological effect on the pulp with MTA.

**Material and method:** 8 male Sprague-Dawley rats were used, with an approximate weight of 230 gr. Two groups were established according to the agent used MTA and  $\beta$ -TCP). Pulpotomies were carried out in the first and second upper molars of each rat. Once they had been anesthetized with an intramuscular injection of xylazine and ketamine chlorhydrate, the pulp was exposed and the material was applied. Following this, the zinc oxide eugenol base was placed and filled with amalgam. After 30 days the rats were sacrificed and the fragments of the jaws that contained teeth were extracted for later decalcification and histological study. The degree of pulp inflammation and necrosis was evaluated, together with the presence of a dentin bridge and reparative dentin along the root canals, the presence and regularity of the odontoblastic layer and pulp fibrosis.

**Results:** Inflammation was not observed in any of the two groups studied. The MTA group was associated with greater dentin bridge formation. For the odontoblastic and fibrosis variables the treatment was different, with the MTA group being associated with a regular odontoblastic layer and with a greater presence of fibrotic tissue.

**Conclusions:** Although the results obtained with  $\beta$ -TCP are acceptable, more studies are necessary so that it can be considered a material for pulp protection.

### 33. LEARNING MORPHOLOGY AND DENTAL SURGERY FOR CHILDREN IN TEETH CARVED OUT OF BOVINE BONE

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**Introduction:** The teaching of morphology and dental anatomy at universities has been based since the last century on drawings and carving teeth using soap, wax blocks or plaster. These materials were used because they were all soft, but the models obtained tend to be much larger than natural teeth. Moreover, preclinical practice of dental surgery, for children as well as adults, is carried out on resin typodonts, a much softer material than teeth and where the speed of the turbines produces excessive destruction and/or the overheating of the plastic material. Both things lead to deficient learning of dental morphology and a surgical feeling that does not resemble the hard dental tissues that the student will encounter.

**Objectives:** Carving bovine bones (which are easy to acquire) could turn out to be the ideal method for learning dental morphology and dental surgery since students would be carving a material that is similar to that of natural teeth, and they would learn how to operate a turbine, a contra angle drill and a handpiece when trying to reproduce teeth and Black's cavities.

**Material and method:** These authors have thought of an innovative teaching method that consists in learning morphology by carving teeth out of bovine bone marrow which can then be used as a typodont for dental surgery. This system would be ideal for learning anatomy on a 1:1 scale and for later practicing dental surgery on material with a hardness that is similar to dental tissue. Later on the student can use the cavities that have been made in these teeth to fill them with either SA or composite.

The students would have cylinder shaped portions of bovine bone measuring 6 to 10 cm in length, and they would use one of the two circumferences of the cylinder for resting on the laboratory table and the other circumference so that by carving prisms, teeth of a natural size could be shaped.

**Conclusions:** This presentation describes a study method on bovine bones that enables the reproduction of teeth, as well as the system followed by a group of students of pediatric dentistry of a prototype of what could be an innovative teaching method that could be applied to any dental study program.

### 34. MALOCCLUSION DEVELOPMENT ASSOCIATED WITH HARMFUL SUCKING HABITS. LONGITUDINAL STUDY

**Franco V, Gorritxo B, Ramila E, Franco N, Gorritxo A**

*Departamento Estomatología. Universidad del País Vasco. UPV/EHU*

*Introduction:* Non-nutritious sucking habits represent a physiological activity during the first months of life of a child, but if they are maintained they can affect the development of dental occlusion. With regard to non-nutritious sucking, the most harmful of these oral habits is the prolonged use of pacifiers and finger sucking. The degree and type of disturbance that these habits can produce in the occlusion of a child varies according to the type of habit, duration, intensity and frequency as well as the biotypical characteristics of the patient.

*Objectives:* The aim of this study was to find out using a sample of school children the rate of non-nutritious sucking habits (pacifier and finger sucking), the role in the origin of dental malocclusion in the primary dentition, and monitor these disturbances until the next dentition stage (mixed dentition)

*Material and methods:* A longitudinal epidemiological study was carried out using a sample of 225 children who were aged 2 to 10 years in the Basque autonomous community.

The data were obtained using a questionnaire on habits that was given to parents and from the clinical examination of the children during which any occlusion disorders were registered such as: anterior open bite and posterior crossbite.

*Results:* A significant increase in malocclusion was found in the primary dentition in children who had non-nutritious sucking habits (pacifier and finger sucking). Anterior openbite improved on abandoning the habit early, however posterior crossbites carried on or became worse, even though the sucking habit had been abandoned.

*Conclusions:* Non-nutritious sucking habits influence dental development and occlusion, and the early detection of malocclusion irregularities is therefore necessary. We discovered that this does not self-correct and that during the primary dentition crossbite will worsen.

### 35. MICRO-INVASIVE THERAPY: RESIN INFILTRATION FOR INCIPIENT CARIES

**Villalón G, Huertas MD, Gutiérrez N, González E, Mendoza A**

*Universidad de Sevilla*

*Introduction:* A carious lesion starts with the demineralization of the surface of the enamel, and clinically it appears as a white stain with no cavity that interferes with aesthetics. Radiographically it is limited to the enamel. Until recently these types of lesions only had one type of treatment, which was “preventative” and

entailed fluoride therapy. These lesions can be remineralized and they should not be restored.

There is currently “micro-invasive” treatment for this type of lesion through infiltrant resin. This method claims to stop the progression of caries and to hide the characteristic white spots of these lesions. For this type of treatment we will find on the market an Icon product, by the manufacturer DMG (Hamburg, Germany), which is aimed at incipient caries, without perforations and that radiographically can extend beyond the enamel, into the exterior third of the dentin. Two types are available: Icon Proximal Caries Infiltrant for conservative treatment of hard tissue in proximal incipient caries, and Icon Vestibular Caries Infiltrant for smooth surface infiltration.

*Material and method:* We carried out a review of the literature on the subject using Pubmed and Medline of the articles published in the last 5 years, using the keywords “caries infiltration”, “caries lesion”, “icon proximal”. And we used the official DGM webpage to find out more about the product Icon.

*Conclusions:* According to the literature it is effective treatment for incipient carious lesions, although there is little scientific literature on the long term results and very few studies on this method carried out on humans. Under our criteria we feel that this therapy is good for those cases with a radiographic diagnosis of caries lesion of the enamel, as we know that if treated using restoration therapy we do more damage by eliminating healthy surrounding tissue. We disagree on its use, even when there is no cavity, when the lesion is deep into the exterior third of the dentin. We believe that more studies should be carried out on micro-invasive therapy and its long-term effectiveness.

### 36. IMPORTANCE OF EARLY DETECTION AND ACTION REGARDING ERUPTION ANOMALIES

**Biedma M, Ribas D, Vilches A, Mendoza A**

*Universidad de Sevilla*

*Introduction:* Eruption pathologies refer to problems that are local, systemic or of various types. Because they have repercussions on the eruption physiology, the correct chronology or sequence can be disturbed. Eruption failure affects both primary and permanent teeth although it generally has a different constitution. Given its frequency, we will refer to the problems that, at a local level, cause a delay or an advancement in the eruption of the permanent dentition.

*Objectives:* To determine the importance of observing in detail an orthopantomography in order to diagnose all those pathologies regarding size, number, shape, dental position, as well as those pathologies that could be tumors or cysts and that can disturb eruption causing a delay or an advancement.

*Material and method:* Half-arch evaluation of the eruption problems of children aged 6-13 years in 100 orthopantomographies by means of the image process-

ing software program SIDEXIS XG, using the magnifying glass application.

*Results:* Only five patients had systemic pathologies (syndromes). Most of the eruption anomalies found were due to position (ectopic) and eruption delays given a lack of space, followed by agenesis.

*Conclusion:* Dental eruption accidents are not a common reason for concern among patients, however, pediatric dentists should be vigilant so that more serious pathologies are not overlooked. Early detection and action of chronological and topographic anomalies permit a reduction of complications later (inclusions, malocclusion, etc.) that are always more difficult to treat.

### 37. PROPIOCEPTIVE MAINTAINERS: DESCRIPTION, INDICATION AND ADVANTAGES

**Vilches A, Biedma M, Caleza C, Iglesias A, Mendoza A**

*Universidad de Sevilla*

*Introduction:* The early loss of primary teeth in most cases entails a loss of space and, as a result, a reduction in the length of the arch. While all teeth are important in the primary dentition, the importance of the second primary molar should be highlighted, especially before the eruption of the permanent first molar, as this primary molar not only has to maintain the space for the second premolar, but it also has to guide the eruption of the permanent first molar.

*Objective:* To avoid loss of space, occlusal disorders and dental malpositions.

*Material and method:* The study included a sample of 12 patients with ages ranging between 4 and 7 years, with a loss of primary second molars and space preservation requirements because of an eruption failure of the permanent second molars. Monitoring was carried out: Clinical examination: the presence of pain, inflammation. Emergencies, breaks and detachments. Radiology; loss of space, presence of folliculitis and inclination. The patients were reevaluated after 3 months and then every 6 months.

*Results:* Only one patient had a break and detachment of the maintainer. In no cases were signs of inflammation or pain found. The inclination of the permanent molar on erupting was seen in a certain number of cases.

*Conclusions:* The correct eruption of the permanent first molar is a key factor for establishing normal occlusion, and it is because of this that the proprioceptive maintainer is presented as treatment for the early loss of primary second molars before the eruption of the permanent first molar. The intragingival maintainer is rejected because of the complications that it often produces. In addition removable maintainers should only be used when there is a loss of more than one primary molar in the same half-arch, given that as the cooperation of the child is relied upon, our objective of guiding the eruption of the first permanent molar is generally not met.

### 38. ORODENTAL HEALTH OF CHILDREN UNDER THE AGE OF 3 YEARS: KNOWLEDGE LEVELS OF THEIR RELATIVES

**Moreno M, Quintero MA, Corcuera JR**

*Universidad de Sevilla*

*Introduction:* Promoting orodental health for children aged 0-3 years, in the first year of infant education centers that are part of the Junta de Andalucía, is part of the program "Sonrisitas" (little smiles). For this, three nursery schools of the municipalities of San Fernando and Chiclana de la Frontera asked us to carry out a conference on pediatric orodental health with support material for imparting information on healthy habits to the families of these pupils.

*Objectives:* To analyze the degree of knowledge before and after the talks of their relatives, to increase orodental health, and to encourage the prevention of disease in the child population.

*Material and methods:* An anonymous questionnaire was carried out before starting the talks in order to evaluate the information families had on orodental health of those under the age of three. Once the talk had been finished, and during the questions and answers section, the survey was handed out again. The survey belongs to the "Sonrisitas" program and it contains 14 questions that can be answered with two possible replies: True or False. The results are analyzed using the statistical analysis with the program SPSS.

*Conclusion:* Teaching healthy habits to the parents and family member of children is very important in order to prevent caries and dental malocclusion. They are not aware of the problems that the prolonged use of sucking bottles entails, or of drinking sugary juices and refreshments, and neither are they aware of sugar abuse and the sugar society pushes us to consume.

### 39. MANDIBULAR FRACTURES IN PEDIATRICS

**Duarte MJ, Moncunill J, Brunet LI, Cahuana A**

*Introduction:* Mandible fractures in pediatric patients have their own characteristics that are different to those produced in adults. They have a low prevalence and a diverse etiology depending on age: chance falls, sports, traffic accidents... Therapeutic management varies according to the location of the mandibular fracture (condylar, parasymphiseal...) either single or multiple, with or without fragment displacement.

*Objective:* The objective of this study was to compare the casuistry of mandibular fractures in the pediatric dentistry department of the Hospital Sant Joan de Déu in Barcelona, in order to evaluate the therapeutic management and to carry out a comparison with current literature.

*Material and method:* Analysis of mandibular fractures in 168 patients and the therapeutic management of pediatric patients over the period 1990-2010 in our hospital area. Search for articles in PubMed and literature review in the same period using the keywords:

mandibular fractures, condylar fractures, facial trauma, pediatric.

*Results:* A predominance in the male sex was observed (relationship 1.8:1), age range was 2-17 years with an average of 10.3 years. Some 64.1% (134 patients) of the fractures were located in the condylar region: unilateral (108) and bilateral (26); parasymphyseal (22.5%) and ramus (10.5%) and chin (2.9%). The main etiology in those under 10 years was: chance falls (44.9%), bicycle accidents (21%) and in those over the age of 10 it was: traffic accidents (35.2%) and bicycle (23.9%). The diagnosis was clinical and radiographic using CT in some cases. Treatment depended on age, location of the fracture and any secondary malocclusion due to trauma, and it was conservative: 57.1% were treated with kinesitherapy. In the long term satisfactory function and movement was achieved in 85% of patients. Of the thirty articles reviewed, only seven of these were analyzed and compared as they met similar criteria of our casuistry.

One of the studies reports that the maximum interincisal distance in the aperture of the mouth varies from 34 to 43 mm with a mean of 38.3 mm. The mean lateral movement from the side of the fracture and the contralateral side was 8.4 mm and 7.8 mm respectively.

*Conclusions:* The treatment of choice for condylar fractures in pediatric patients is unanimously conservative, with intermaxillary fixation or not, depending on occlusal disorders, and combined with later rehabilitation or kinesitherapy. The fractures that affect other mandibular areas require surgical management due to the displacement of bone fragments.

#### 40. STUDY ON THE DENTAL MATURITY OF PATIENTS AGED 6 TO 9 YEARS. RACE COMPARISON

**Perdomo N, Ávila D, Bartolomé B, Correa E, Moreno P**

*Introduction:* The study of growth and maturity has been a very obvious concern of different investigators over the years. Within the dental disciplines, in pediatric dentistry as well as in orthodontics, being able to know the growth of a child and his development stage is particularly important for diagnosis and later treatment plans.

Dental maturity is an indicator that enables the observation of this growth. It is a progressive, continuous and accumulative process, which is less influenced by local and systemic factors than by other development systems and that can be followed from birth.

The Demirjian and cols method is one of the most used by the majority of authors because it is a simple method that is easy to reproduce. Various studies, however, have made it clear that there are differences with regard to chronology and dental formation depending on the population studied.

*Objectives:* To analyze the dental maturity stage of the lower left permanent canine.

To compare any development differences between sexes.

To establish if there are differences in development between the sexes.

To establish the differences in maturity between Spanish and South American children aged 6 to 9 years.

*Material and methods:* The population studied was made up of patients aged 6 to 9 years who attended the University Dental Clinic of the European University of Madrid. The work was carried out by means of an examination of 80 panoramic radiographies of boys and girls of both ethnic groups, which was carried out by a single observer.

*Results:* The most common stage found in Spanish children was: At six years, stage C; at 7 years, stage D; at 8 years, stage E and at 9 years, stage E.

For the South American children the results obtained were: At 6 years, stage D; at 7 years, stage E; at 8 years, stage E and at 9 years, stage F.

The data collected was put onto a computer and the statistical program STATGRAPHICS was used.

*Conclusions:* South American children have dental maturity that is more advanced than that of Spanish children. The girls of both ethnic groups were more mature than the boys.

#### 41. DOES SALIVA INFLUENCE THE PREVALENCE OF CARIES?

**Ruiz A, Sáez S, Cuadros C, Guinot F, Lorente AI**

*Departamento de Odontopediatría. Universitat Internacional de Catalunya*

*Introduction:* Taking into account individual and community intervention with regard to caries management, the need arises for a protocol for determining caries risk in children based on various factors and risk indicators. Currently there are different kits that can easily be used for clinical examinations. These provide an analysis of the salivary characteristics that in turn provide valuable personalized information on our patients.

*Objective:* To establish the prevalence of caries with the indicators DFMS, DMFT and dft, and to identify the factors and risk indicator in order to establish their predictive value.

*Material and methods:* The sample was made up of 20 children who attended the Pediatric Dentistry department of the dental clinic of the International University of Catalonia. They were aged 6 to 12 years, and their parents had signed an informed consent form. During this visit, an examination was carried out with a mirror and probe, radiographies were taken, dental plaque measured, salivary flow assessed, pH and buffer capacity measured together with S. Mutans formation, of the children who were in the study. Their parents filled in a questionnaire on the diet and oral hygiene habits of their children.

The data were analyzed with the statistical program Statgraphics® Plus version 5.1 using ANOVA multifactorial analysis, a logistic regression model and Student's-T test, and  $P < 0.05$  was considered statistically significant.

*Results:* The results indicated a DMFS caries prevalence of 1.75, 5% for DMFT and 8% for dft. Statistical-



ly significant differences were observed with regard to the correlation between age and dft ( $P = 0.001$ ), and the S.Mutans test with DMFS ( $P = 0.001$ ) and dft ( $P = 0.05$ ). The rest of the data analyzed was not statistically significant.

*Conclusions:* Dental caries continues to be a disease with a high prevalence but there are methods for predicting it. Carrying out studies with larger samples is necessary in order to evaluate which parameters are the most reliable.

#### 42. RELATIONSHIP BETWEEN THE ORAL HEALTH OF PARENTS AND CHILDREN IN A POPULATION OF BARCELONA, SPAIN

**Gómez N, Palma C, García A, González Y**  
*Universidad de Barcelona*

*Introduction:* Caries is a common, transmissible, infectious disease that arises over time because of an imbalance between risk and protector factors. These risk factors include: presence of cariogenic bacteria and mature plaque, frequent consumption of fermentable carbohydrates, night eating with no hygiene, low socioeconomic level, abnormal salivary flow and early bacterial colonization. Many studies claim that the presence of active caries in parents/carers is related to bacterial transmission and to early childhood caries ECC.

*Objectives:* - To find out if there is an association between the oral health of parents and children aged 0-6 years in a population of preschoolers in Barcelona, Spain.

—To assess how the oral hygiene of parents, their dietary habits and socio-educational level affects the oral health of their children.

*Materials and methods:* Descriptive, observational, cross-sectional study of 71 couples made up of mothers and their children who were up to 6 years old. They attended the pediatric dentistry department of the social security of the primary care service of Sardenya, and the Bellvitge dental hospital in Barcelona between the months of October 2011 and March 2012. Using a questionnaire the risk factors of both mother and child were taken. After consent was obtained the parents and their children were examined clinically in order to evaluate their caries index.

*Results:* The total population was of 71 pairs of parents and children. The mean age of the parents was 37.1 and 3.9 for the children. In the group of parents that replied positively to behavior regarding early bacterial transmission (69%), the children had a high caries rate. A close association was found between low socio-cultural level, low brushing frequency and high sugar consumption among parents and their children.

*Conclusions:* In this study a link was found between behavior related to bacterial transmission, socio-educational level, brushing frequency and ingestion of sugar frequency of the parents with the presence of caries in the children. The importance of developing educational programs is stressed with the participation of parents with children of a preschool age, and pregnant mothers,

in order to have good oral health habits, as erroneous habits can have a direct effect on caries process.

#### 43. EVALUATION OF THE EFFECT ON PULP OF MTA AND MELATONIN IN PULPOTOMIES

**Guerrero J, Alcaina A, Ortiz E, Ortiz C, Ortiz AJ**

*Introduction:* The most used material for direct pulp protection is MTA. The problem with MTA is its high cost, and the search for new materials continues. Melatonin plays an essential role in bone growth regulation. We suspect that the action mechanism of melatonin on osteoblasts can arise on odontoblasts.

*Objectives:* To evaluate pulp response on the teeth of rats when melatonin is used for direct pulp capping. In addition, to evaluate the antioxidant effect of melatonin taken orally, and if this boosts the effect of the materials in the study.

*Material and methods:* Direct pulp protection was carried out on 16 upper molars of Sprague-Dawley rats (SD) in each of the four experimental groups that were: MTA, Melatonin, MTA + Melatonin taken orally, and Melatonin + Melatonin taken orally. MTA and Melatonin were used as agents for direct pulp protection, and in the last two groups dissolved melatonin was used in the rats' drinking water. Thirty days later the rats were sacrificed and their blood, kidneys and liver were extracted for oxidative stress analysis using TBARS analysis. The maxilla fragments that contained the molars under study were prepared for histologic evaluation during which an assessment was made of the degree of pulp inflammation, the degree of pulp necrosis, the presence of a dentinal bridge and reparative dentin along the canals, the presence and regularity of the odontoblastic layer and the presence of pulp fibrosis.

*Results:* In the melatonin group there was less dentinal bridge formation with regard to the other groups. In the rest of the variables studied there were no significant differences.

*Conclusions:* Although the results obtained with melatonin are acceptable, more studies are needed before it can be considered a material for pulp protection.

#### 44. QUANTIFICATION OF STREPTOCOCCUS MUTANS AND IMMUNOGLOBULIN RECOUNT IN CHILDREN WITH CARIES UNDER THE AGE OF 12 YEARS

**Flores A, Ortiz M, Ortiz G, Arrollave C, Escartin M**  
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*Introduction:* It has been described that Streptococcus mutans (Sm) is associated with patients with dental caries, as well as with saliva containing a variety of immunoglobulin agents that can interfere with the adhesion, multiplication or metabolism of bacteria. Howev-

er, the possible association between dental caries and proteins that have antimicrobial activity has been, up until now, very controversial.

*General objective:* To detect and quantify *Streptococcus mutans* and its relationship with the immune system.

*Material and methods:* the sample was made up of 28 children with caries and 28 children without caries as a control group. The quantification of *S. mutans* was carried out using the dentocoult SM system, and the quantification of immunoglobulin was carried out using the nephelometric technique.

*Results:* IgA levels were found to be less concentrated in those children with dental caries than in those without caries. There are lower concentrations in children with dental caries than in those without caries. Children without clinical caries lesions can have *S. mutans* in high quantities, which means that some high risk patients can develop carious lesions. The relative risk that dental caries can manifest when there are *S. mutans* colony-forming units that are greater than 100.000 cfu/mL is 2:1

*Conclusions:* There is an association between low IgA concentrations and a high *S. mutans* count in the presence of dental caries. These data provide information that will enable strategies to be adopted that will help to measure predisposition, susceptibility and infection risk due to caries in patient with rampant caries as well as those who are caries-free or who have multiple dental restorations.

#### 45. INDIRECT PULP CAPPING FOR PRIMARY TEETH; BIOCOMPATIBILITY OF SOME ADHESIVE SYSTEMS.

**Cortés O, García C, Alcaina MA, Crespo S**  
*Odontopediatría. Facultad de Odontología. Universidad de Murcia*

*Introduction:* Advances in biomedical investigation and the process of caries progression, have enabled us to understand the molecular and cellular mechanisms that determine the repair potential of the dentin-pulp complex in such a way that on coming across a deep carious lesion with reversible pulpitis in primary teeth, the indications for indirect pulp capping and for a pulpotomy can be the same. The difference arises when the pulp is exposed on completely eliminating the caries. Some authors suggest that under these conditions, a less invasive pulpal procedure such as indirect capping can change the activity of the lesion and arrest it, which is beneficial for repairing the pulp as integrity is maintained. Among the materials that are considered, in addition to glass ionomer and calcium hydroxide, we will find dentin adhesives. The biological compatibility of these materials is of great importance in order to avoid or limit pulp irritation in these procedures.

*Objective:* To evaluate biocompatibility of the different adhesion systems; two-stage conventional bonding (Prime & Bond NT® (Dentsply) and Excite F

DSC® (Vivadent), as opposed to self-etching adhesives (AdheSE One F® (Vivadent)).

*Material and method:* A cytotoxicity study was carried out using MTT assays in an L929 fibroblast culture, using an indirect method by means of extracts following the regulations of in vitro cytotoxicity tests (ISO 10993-5), with the different adhesive systems.

*Results:* A moderate percentage of viability was observed with all the viabilities, and the biocompatibility of the sequence was the following AdheSE One F® > Excite F DSC® > Xeno V+® (Dentsply) > Prime & Bond NT®. The statistical analysis gave significant differences between the different concentrations of the materials regarding cell viability.

#### 46. CARIES RISK FACTORS IN VALENCIAN CHILDREN FROM AN EARLY AGE

**Borrell C, Ribelles M, Carmona M, Gandía A, Marqués L**

*Universidad Cardenal Herrera (Valencia). Facultad de Odontología*

*Introduction:* Dental caries continues to be the most common infectious disease in childhood. For this reason it is important to discover the most relevant risk factors in order to establish suitable preventative strategies that are aimed at reducing the prevalence in this population.

*Objectives:* To analyze the caries risk factor of a group of children in the Community of Valencia (Spain) aged 0 to 3 years after carrying out a survey that was aimed at their parents.

*Materials and methods:* A cross-sectional survey-type study was carried out which analyzed the different risk factors related to dental caries development. The survey was conducted among 141 parents of children attending one of the four nursery schools in the different geographical areas of the Community of Valencia, and who voluntarily participated in the study. The statistical analysis was carried out using the SPSS program and the chi-square technique.

*Results:* 87,9% of the individuals filling out the questionnaire were women. When this was related to the variables that provided information on whether the mothers had oral hygiene knowledge a p-value > 0.05 was obtained. In other words, no statistically significant differences were obtained. The same occurred on relating dental hygiene and care given by parents to their children, independently of the number of children. Of the mothers, 41.8% were older than 35 years. Statistically significant differences were not found regarding oral hygiene knowledge and their age. However, it was observed that dietary habits that mothers passed on to their children were different depending on their age. With regard to socioeconomic status and dietary habits, statistically significant differences were not obtained.

*Conclusions:* Parents are not conscious of the importance of their children's oral health during their early years. Giving informative talks is very important from an early age in order to avoid the development of dental caries.

#### 47. LONG-TERM MONITORING OF PULP AND PERIODONTAL HEALTH AND OF ROOT DEVELOPMENT IN AUTOTRANSPLANTED PREMOLARS IN THE UPPER INCISOR REGION

**Caleza C, Iglesias A, Solano E, Mendoza A**  
*Universidad de Sevilla*

*Introduction:* Revascularization is defined as the clinical healing of periapical abscesses and a continuation of root formation in immature teeth with non-vital pulp. Recently there have been a growing number of scientific reports that show that revascularization could be another treatment option for restoring root development and apex closure.

Disinfection using the intra-canal lining as a medium for disinfecting with triple antibiotic paste (metronidazole, ciprofloxacin and minocycline) has been described in many studies as successful. However, numerous studies describe the inconveniences of this triple antibiotic mixture:

- Development of bacterial resistance on using 3 antibiotics.
- Allergic reaction to one of the 3 antibiotics.
- Discoloration of the crown because of minocycline use.

An alternative protocol for disinfection has been introduced recently which entails apex irrigation with negative pressure (Endovac system). Less inflammatory infiltrate has been observed together with considerable bacterial reduction. But in the remaining parameters the differences are not significant. This raises the issue of introducing a new alternative to these two disinfection protocols that consists in disinfection using only two antibiotics (metronidazole and ciprofloxacin) and using the Endovac system for irrigation.

*Objectives:*

—To compare pulp revascularization of immature teeth with apical periodontitis by means of disinfection with metronidazole, ciprofloxacin and apex irrigation using negative pressure with other protocols that have already been described in the literature.

—To observe if there is an absence of clinical signs of infection or inflammation and discoloration.

—To evaluate the outcome of the lesion radiographically regarding apex closure, root length and thickness of walls.

—To study histologically and immunohistochemically the tissues formed.

—To evaluate the reduction of bacterial colonies.

*Materials and methods:* For this investigation the sample will be made up of the permanent first premolars of 3 beagle dogs aged 5 months that will be divided into 5 treatment groups. The experiment is to be carried out in the centralized department for animal experimentation in the Campus de los Rabanales of the University of Cordoba. During the experimental stage the dogs will be monitored daily in order to detect signs of pain associated with dental procedures and clinical and radiographical evaluations will be carried out. After the experimental period the animals will be sacrificed and a necropsy of the jaws of each animal will be carried out so that the samples can be processed and a histological,

immunohistochemical and microbiological evaluation carried out together with a statistical analysis with all the results.

#### 48. RELATIONSHIP OF THE HYOID BONE WITH OBSTRUCTIVE SLEEP APNEA SYNDROME

**Chung I, Bermúdez M, Beltri P, Vilar C**  
*Universidad Europea de Madrid*

*Introduction:* The main etiological factor in children with obstruction sleep apnea syndrome (OSAS) due to adenoid and palatine tonsil hypertrophy, is nasal airway obstruction. Studies have revealed that through lateral telerradiography of the skull it is possible to analyze craniofacial morphology and relationships in children, and also the upper airways. Cephalometry is in addition a useful tool for studying anatomic anomalies, for following the craniofacial growth of patients and for developing treatment plans in dentofacial orthodontics and orthopedics.

*Objectives:* The aim of this investigation was to study the position of the hyoid bone with regard to the position of the mandible and cervical vertebrae in pediatric patients with oral breathing, and to compare this with patients with nasal breathing. And, to determine if cephalometric studies are a useful test for detecting anatomic anomalies in patients with OSAS.

*Material and method:* The telerradiographies of 118 pediatric patients of the university dental clinic of the European University of Madrid were studied. These belonged to 51 girls and 67 boys who were aged between 6 and 12 years. Of these patients 53 were oral breathers and 65 were nasal breathers. The size of the airway was studied together with the position of the hyoid bone and the relationship with this type of breathing.

*Results:* it was found that in most of the patients with oral breathing, the hyoid bone was situated above the RGN – C3 plane or at the same height. On the other hand, in patients with nasal breathing it was found that the hyoid bone was underneath the RGN – C3 plane, and that the hyoid triangle was in a positive position. This indicates that the position of the hyoid bone can vary depending on the type of breathing and that these differences are statistically significant ( $p < 0.0001$ ).

*Conclusions:* It is evident from the results of this study that patients who are oral breathers have a hyoid bone in a higher position in relationship with the line formed by the mandible and third cervical vertebrae compared with patients with nasal breathing.

#### 49. VISIBLE PORTION OF INCISORS AND LIP LENGTH OF MEXICAN ADOLESCENTS

**Verdugo I, Rodríguez A, Zamudio M, Fregoso C, Leyva E**  
*Universidad Autónoma de Baja California*

*Introduction:* The assessment of the visible portion of incisors and the length of the upper lip represent an

important part of dental diagnosis and therapy. Practitioners can carry out an aesthetic evaluation of a patient by comparing data of the patient with average values of aesthetically acceptable individuals.

*Objective:* To compare the visible portion of upper incisors and the length of the upper lip of adolescents with the values obtained in Mexican adolescents with normal occlusion and facial balance.

*Materials and methods:* Cross-sectional, descriptive and comparative study. Mexican adolescents aged 12 to 18 years were measured with a digital calibrator: visible portion of the upper central incisor, visible portion of the upper lateral incisor and length of the upper lip. They were separated into groups. Study group 1: adolescents with maxillary teeth present. Control group 2: normal occlusion characteristics and balanced facial proportions. Student's test was carried out in order to compare both measurements, minimum level of significance  $p < 0.05$ .

*Results:* A total of 1258 adolescents were examined. For Group 1, 300 were randomly chosen and 111 for Group 2. There were no significant differences with regard to age and sex ( $p = 0.57$ ). Study group 1: included 137 (45.7%) females and 163 (54.3%) males; mean age:  $14.82 \pm 1.64$ . Mean values: visible central proportion  $3.25 \pm 1.35$  mm; Lateral visible portion  $3.24 \pm 1.35$  mm; Lip length  $20.04 \pm 2.45$  mm. Type: similar central and lateral visible portion; length of lip greater in males, significant difference ( $p < 0.001$ ). Control group 2: included 64 (57.7%) females, 47 (42.3%) males; mean age  $15.05 \pm 1.99$ . Mean values: central visible portion  $2.87 \pm 0.43$  mm; lateral visible portion  $2.65 \pm 0.53$  mm; lip length  $20.61 \pm 1.13$  mm. Type: central and lateral incisor of females slightly larger with no significant differences; lip length greater in males, significant difference ( $p < 0.01$ ). Comparison between groups: Group 1 significantly greater visible portion of central ( $p < 0.005$ ) lateral ( $p < 0.0005$ ) incisor. The length of the lip was shorter in Group 1 with a significant difference ( $p < 0.01$ ). Type: visible portion of incisors greater in Group 1 with significant difference; central ( $p < 0.025$ ) lateral ( $p < 0.005$ ) incisor. The length of the lip between females was significantly larger in Group 2 ( $p < 0.0005$ ) while among the males there was no significant difference ( $p > 0.05$ ).

*Conclusions:* The mean values are larger, with significant differences, regarding the visible portion of the central ( $p < 0.005$ ) and lateral ( $p < 0.0005$ ) incisors of Mexican teenagers when compared to their counterparts with normal occlusion and facial balance. However, the length of the upper lip was shorter with a significant difference ( $p < 0.01$ ). The females with normal occlusion and facial balance had a greater visible portion of central and lateral incisors than the males, but the relationship was not statistically significant ( $p > 0.05$ ).

## 50. THE VALUE OF PEDIATRIC DENTISTS IN OUR SOCIETY

Sepúlveda M, Carmona M, Gimeno P, Gandía A, Ribelles M

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*Introduction:* We all know that to exercise our profession we need high-quality and extensive training in the different fields of dentistry together with large amounts of patience. But does society actually know in what a pediatric dentist's job actually entail. What is not transmitted does not exist. What are we doing wrong?

*Objective:* To make the public more aware of the figure of the pediatric dentist as someone who is dedicated to children from very early ages and who makes a tremendous effort to promote pediatric dental health in different areas (proper mastication and swallowing, social smile, phonetics and pronunciation, etc.), while working throughout a child's growing years.

*Material and method:* Spanish children still go to their parent's dentist, who is a general dentist, when they have a dental problem. But when they are ill they do not go to a general practitioner but to a pediatrician. The figure of the pediatric dentist does however exist in Health Centers, but very few of the professionals working there are exclusively dedicated to pediatric dentistry, neither do they have a master's degree or a degree in this discipline. Young pediatric dentists work in very negative conditions in some dental clinics where pediatric dental health is not sufficiently valued, and children are used to capture their adult relatives.

Given this situation we contacted a private company in Valencia: Ingenieros Asociados, and their head of marketing Mr. Pablo Gimeno Bellver, in order to study our concerns and to look for solutions.

*Conclusions:* Spanish society should be informed and made aware of the importance of our work. Pediatricians and pediatric dentists should work as a team as professionals in charge of general health and the oral health of babies, children and adolescents. If parents do not hesitate to take their children to a pediatrician, we have to try and achieve this when they have orodental problems. We should prepare and plan strategies to reach these families and make them believe that the orodental health of their children would be better in our hands.

## 51. PREVALENCE OF ORAL DISORDERS IN CHILDREN AGED 0-36 MONTHS

Rivas K, Palma C, González Y

Universidad de Barcelona

*Introduction:* The different aspects of a baby's mouth are both unique and unusual during this period of his life. Just as physiological processes are typical, there are also developmental disorders and diseases that are particular of this age. Studies on the prevalence of oral pathology carried out on the Spanish pediatric population are scarce, and the few studies that do exist assess children at preschool and school ages.

*Objective:* The objective of this study was to carry out a prospective description of the lesions of the oral mucosa and hard tissue of the oral cavity in children aged 0 to 36 months.

*Material and methods:* an observational, descriptive and cross-sectional study was carried out. All the newly born and nursing babies were included who were aged

between 0 months and 36 months who attended the department of pediatric dentistry of the primary care center of Sardenya, Barcelona, between the months of October 2011 and March 2012. The sociodemographic data were collected during a previous interview with parents and a single observer carried out the clinical examination of the babies on a trolley with a LED hand light, gloves and a tongue spatula.

**Results:** Data were collected on 92 children with a mean age of 16.10 months. Of these 54% were boys and 46% girls. Of the patients studied 52% had oral disorders, but 48% did not. The most common oral disorders were dental trauma 9%, malocclusion 13%, and pathologic lingual frenum 12%. Caries was observed in 7% of children.

**Conclusions:** Despite the existence of oral disorders that are particular to this age group and that usually do not require treatment, it is important for professionals working with newly born and nursing babies to be familiar with these disorders so that they can reassure parents when they appear as to their prognosis. However, the results of our study should serve to alert us on the prevalence of dental trauma, caries and malocclusion which generally require intervention to limit the damage, halt the process and to restore oral health.

## 52. THE EFFECTIVENESS OF TWO TOPICAL ANESTHETICS IN SEALANT TREATMENTS

**Marqués L, Ribelles M, Carmona M, Gandía A, Borrell C**

*Universidad Cardenal Herrera (Valencia). Facultad de Odontología*

**Introduction:** One of the most important aspects of pediatric dentistry treatment is controlling pain. For this reason pediatric dentists should be familiar with the different anesthetic techniques which should be put into practice. However, there are procedures that do not require local anesthesia, such as when sealants are applied. This procedure does require the use of a rubber dam in order to control humidity. Placing the clamp does imply a certain degree of pain, but this can be deadened with the use of topical anesthesia.

**Objectives:** To compare the effectiveness of topical anesthesia, a eutectic mixture of 4% lidocaine and prilocaine vs. 20% benzocaine, and to compare the psychological effect of a placebo and not applying any mixture at all when the clamp is placed before the sealants are applied.

**Material and methods:** The sample in the study was made up of 24 children who were aged 5 to 10 years, who required sealants in the first four permanent molars. The investigation was designed in two phases. In Test A two sealants were applied in two of the permanent first molars, and in one tooth 20% benzocaine gel was placed and in the other 4% lidocaine and prilocaine cream before placing the clamp. In Test B two sealants were applied in the remaining two molars. In one a placebo was placed and in the other no mixture was placed at all. In order to measure the level of pain intensity when the clamp was placed the

faces pain scale - revised was used. A comparative statistical study was carried out using the Wilcoxon non-parametric test ( $p < 0.05$ ).

**Results:** When the clinical situations were compared, it was observed that with the application of 4% lidocaine and prilocaine the values were lower and statistically significant when compared to the application of 20% benzocaine gel ( $p < 0.05$ ), the placebo ( $p < 0.05$ ) and when no mixture was applied ( $p < 0.05$ ).

**Conclusions:** The eutectic mixture of 4% lidocaine and prilocaine was more effective as a topical anesthetic during the placement of a clamp before the sealant was applied than 20% benzocaine anesthesia. The psychological effect of topical anesthesia was confirmed, and lower levels were observed in the Faces Pain Scale - Revised when a placebo was applied and when no mixture was applied.

## 53. 3D SYSTEM FOR LEARNING IN PEDIATRIC DENTISTRY

**Gómez B, Adanero A, Martínez E, Mérida JR, Planells P**

*Universidad Complutense de Madrid*

**Introduction:** The arrival of the Bologna Plan to the universities makes it essential for us to adapt our syllabus to the new technologies. Up until now we have used an atlas, or dissections to learn about the anatomy, and we have used books to have a more in depth view of the different aspects of pediatric dentistry.

A virtual reality system would allow students to interact in a simple and dynamic form, while helping them and motivating them to learn.

**Objectives:** To create a virtual model of the mandible, using a real child, that would serve as an educational tool for pediatric dentistry anatomy, and which would represent in a tri-dimensional fashion all the primary teeth and the permanent tooth germs.

**Material and method:** Tomographic slices were obtained of the craniofacial skeleton of a girl aged three years which were transcribed using the Amira 5.3.0 program. All the mandibular structures were segmented: mandible, primary teeth and permanent teeth.

**Results:** A total of 512 slices were obtained in the sagittal and coronal planes and 309 in the transverse plane with a thickness of 0.625 mm. All the structures will be segmented into different colors and a complete tri-dimensional model will be created so that it can be used for didactic purposes.

**Conclusions:** 1. The arrival of educational systems based on the Bologna Plan is a reality. Self-study based on trial and error is a very useful strategy for students. With an interactive model the student is able to assess his knowledge instantly, without the physical presence of a teacher being necessary. 2. By using this real model we aim to describe how to study the anatomy of the primary dentition, and to show the interaction with the developing permanent dentition, in a tri-dimensional fashion. 3. The images obtained on germs in developing permanent teeth in this investigation study will permit

us to evaluate these structures individually and tri-dimensionally in a human subject aged three years. 4. Our objectives with regard to future studies will be directed at the possibility of providing improvements in technical advances, such as the inclusion of a haptic system for the clinical application of dentistry teaching.

#### 54. EPIDEMIOLOGICAL STUDY ON ORAL HEALTH OF STUDENTS OF PRIMERO DE PRIMARIA IN MARCHENA

**Gómez-Vidal B, Amaro R, Basallote M, Galván M, Hidalgo M**

*Servicio Andaluz de Salud*

*Introduction:* An oral examination was carried out of the students of Primero de Primaria (6 year-olds) of the education centers in the municipality of Marchena in the province of Seville.

*Objective:* To evaluate the efficiency of the public health system intended to improve the oral health of the children in Marchena.

*Material and methods:* A visual examination was carried out of the dental surfaces of these 6-year old students who had brought an informed consent. A mirror and natural light were used. Two examiners who had been trained to carry out the same assessment collected the data from the anamnesis sheets and the odontogram recommended by the WHO. DMFT and malocclusion were registered. The different types of malocclusion were classified into: absent, slight, moderate or serious.

*Results:* A total of 184 students were examined and caries lesions were observed in 79 students (42.93%), with a total of 414 teeth that were carious, missing due to caries or filled. This gave a ratio of 2.25 teeth affected per student and 5.24 teeth affected per student with slight, moderate, or severe caries, and a ratio of 0.56 occlusions per student, or 1.36 bad occlusion per student with a pathology.

*Conclusions:* due to the high percentage of students with disease we concluded that the Public Health system is insufficient and we propose new programs.

#### 55. EVALUATION OF CHILD ANXIETY DURING DENTAL VISITS

**De la Hoz A, Arner C, Torres L, Albero G**

*Universidad Europea de Madrid*

*Introduction:* Anxiety in children can interfere with, and even stop, the normal course of their dental treatment. Using anxiety tests permits the detection of high levels of anxiety which can be evaluated throughout the treatment.

*Objectives:* To assess the level of anxiety of children aged 3 to 16 years during their first visit to the pediatric dentist, to observe how this develops throughout the treatment, and to detect those aspects that they find most frightening.

*Material and methods:* The patients who were attending the Master's Degree in Pediatric Dentistry of the European University of Madrid were asked to fill in a questionnaire in order to be able to evaluate their anxiety. Those under the age of eight were given a Venham picture test, while those over 8 years were asked to fill in the Children's fear survey schedule – Dental subscale (CFSS-DS).

On subsequent visits they were asked to fill it in again in order to observe the variations in their level of anxiety. Once the data had been obtained, a statistical study was carried out.

*Results:* Although most of the patients in the group who were under the age of 8 identified during the first visit with the drawings that were associated with low levels of anxiety, on numerous occasions their behavior in the dental chair did not tally with what was expressed in the test, and the behavior shown corresponded to greater levels of anxiety. The results obtained in the questionnaire for the group of children over the age of 8 showed a greater consistency with the behavior shown in the clinic.

*Conclusions:* In this study we observed that the tests used and the level of anxiety observed in children under the age of 8, did not have a high degree of consistency. For this reason we feel it is reasonable to look for new questionnaires or methods that allow the identification of high levels of anxiety in small children in order to improve our daily clinical practice.

#### 56. FREQUENCY AND MAGNITUDE OF INFRA-OCCLUSION IN PRIMARY MOLARS

**Cuesta L, Cardoso C, Alvaro MS, Maroto M, Barberia E**

*Introduction:* Infraocclusion is a disorder that is easily detectable, indicating a modification in the eruptive process and in dental replacement, as well as a disruption in alveolar growth. Clinically it can have a great variety of consequences from having no clinical relevance at all to a significant disturbance in dental replacement, delaying rhizolysis for an indefinite period. In addition, in a specific situation, it can modify the interaction and distribution of the forces of occlusion, leading to malocclusion, which should receive early treatment.

*Objectives:* To determine the frequency, distribution and magnitude of infraoccluded mandibular primary molars.

*Material and methods:* Orthopantomographies were examined, in order to quantify the number of infraocclusions, in a cohort of 472 children. The magnitude of the infraocclusion was determined using a caliber and a millimeter ruler. Infraocclusion of less than 1mm was rejected and an infraocclusion of 3 degrees was established: Grade 1, between 1.9 mm, Grade 2 between 2 and 2.9mm, and Grade 3, more than 3mm.

*Results:* 103 (21.8%) of the 472 children evaluated had one or more infraoccluded mandibular primary molars. The frequency of the infraocclusion due to position was: left primary first molar (36,1%), right

primary second molar (13.0%). Significant distribution differences were not found according to the half-arch or in any age group, or between genders. 73% of the infraocclusions affected first molars. The magnitude of the infraocclusion increased with the age of the children.

*Conclusions:* Primary first molars are more frequently affected by infraocclusion than temporary second molars, and significant differences were not found between the left and right sides.

## 57. A MASTICATORY APPARATUS AND SEVERE HEADACHES IN CHILDREN

**Larena-Avellaneda J, Raigón C, Valencia C**

*Introduction:* Description of a new functional traumatological pathology, Temporomandibular Joint Compromise (TJC) is the most common cause of frequent primary headaches in childhood. We described TJC in Valencia at the 2000 International Neuro-Occlusal Rehabilitation Club Congress.

*Objective:* To continue providing information on this new pathology, TJC.

*Materials:* Child patients with headaches. International classification of headaches. Protocol for the management of headaches in Primary Care, Coordination between levels in Pediatric Health Care in the Health Area of Gran Canaria, Complejo Hospitalario Universitario Insular-Materno Infantil.

*Methodology:* Medical history with a detailed neurological examination, diagnosis verification technique and posture treatment with an apparatus for functional recovery.

*Results:* Cure for most of the patients treated.

*Conclusions:*

1. It has been established that TJC is the main cause of primary headaches in children.

2. The magnificent results of early treatment for TJC in child patients avoids chronicity in adults with added health and financial advantages.

## 58. DENTAL FLUOROSIS AS A RISK FACTOR, SYSTEMIC REVISION

**Marchena L, Fernández CM, Bermúdez Z, Gómez C**

*Introduction:* Fluoride has improved caries problems for many people but it has also been established that an excess consumption of fluoride by the population has led to dental fluorosis.

Frederick McKay observed that patients who present with brown stain on their teeth had fewer caries and from then on many studies have been carried out to date. It has been established that the best concentration of fluoride in water should be 1ppm of fluoride.

*Objectives:* Dental fluorosis should be avoided in developed countries.

*Material and methods:* A review of the literature was carried out over the last 10 years, and a search was made in the Pubmed, Scopus and Medline databases.

*Results:* We have investigated what elements lead to dental fluorosis, and we were able to establish that the origin is in the water that is drunk, in toothpaste, in dental preparations and in some milk fluoridation. Most of the studies have stated that fluoride in high concentration, ingested in the first six years of life, can lead to dental fluorosis.

*Conclusion:* The accumulation of products that contain fluoride in drinking water, fluoride toothpaste, and milk fluoridation, or in the products used by dentists, has meant that in industrialized countries the number of dental fluorosis cases has increased.

It has been advised that toothpaste in children under the age of 3 should contain 600 ppm of fluoride, and that drinking water should have between 0.3-0.6 ppm of fluoride for children under the age of 6 years, and in areas where the water is not fluoridated, fluoride supplements should be between 0.25-0.50 mgr/day in children aged 3 to 6 years and 0.50 mgr/day in children aged 6 to 16 years.

It has also been recommended that periodic checkups should be made by dentists of fluoride concentrations.

*Keywords:* Drinking water, fluoride, effect, caries, risk factors, diagnostic and treatment.

## 59. TREATMENT OF ORAL COMPLICATIONS IN PEDIATRIC ONCOLOGY PATIENTS

**Ríos M, González B, De Nova MJ, Leache B**  
*Universidad Complutense de Madrid*

*Introduction:* In Spain, approximately 850 cases of child cancer are diagnosed every year. Over the last forty years the prognosis of this disease has improved considerably, reaching a survival rate of 75%.

Oncological patients can experience secondary effects, pathologies in the oral cavity that are potentially severe as a direct result of malignant disease, as a secondary effect of chemotherapy. Of these mucositis is the most severe and frequent, and suffered by 65%. This pathology makes eating very difficult and increases the risk of systemic infection, increasing hospital stays and directly influencing the quality of life of the child and family. Pediatric dentists should be familiar with the sequelae that are produced in these patients, in order to reduce the adverse effects in the oral cavity. Therefore, they should put together a procedure plan within their competence, and ideally within that of the oncology team, and design those actions that the child will need before, during and after the active therapy of the disease, personalizing each case and always coordinating with the oncology team. Under these premises we should ask ourselves: What orodental care guidelines should we follow with pediatric oncology patients?

*Objective:* The aim of this work is to analyze the orodental care protocols that are followed in children and juvenile patients who are receiving cancer therapy.

*Material and methods:* For this a search was performed of electronic articles (in the Medline, Pubmed, Cochrane databases) and a manual search made (text books, pediatric dentistry paper journals such as “Pediatric Dentistry”, “The Journal of Clinical Pediatric Dentistry” “European Journal of Paediatric Dentistry” and “Odontología Pediátrica”). The Keywords were: pediatric cancer, pediatric oncology, pediatric malignant neoplasm, neoplastic diseases, chemotherapy, radiotherapy, mucositis and osteoradionecrosis. The results were restricted to publication years (2000-2012) and only studies in children were used (All child: 0-18).

*Conclusion:* It is our responsibility as health professionals to find out how to prevent and treat these orodental side effects in order to improve the quality of life of pediatric oncology patients as far as possible, while coordinating with the oncology team responsible.

## 60. ANOREXIA AND BULIMIA. ORAL MANIFESTATIONS AND THE IMPORTANCE OF AN EARLY DIAGNOSIS

**Reolid N, García L, Hernández A, Barbería E**  
*Universidad Complutense de Madrid*

*Introduction:* Anorexia and bulimia are two psychiatric diseases that affect the relationship between diet and the body itself. They progress with physical, psychological and social complications. They tend to be the external expression of underlying problems of psychosocial development. They are associated with the appearance of manifestations at a general level that are of the hormonal, endocrine or of a cardiac type that can lead to serious somatic complications, interfering in the physical and psychic development of the person. Anorexia is defined as an aversion to food and having a reduced appetite that leads to a severe loss of weight and the distortion of the actual body image.

Bulimia is a perpetual and voracious appetite for large quantities of food that can progress with an increase in hunger to morbid proportions. Compensatory mechanisms will be used due to a feeling of guilt which might be the use of laxatives, diuretics or self-induced vomiting. This type of patient has a large number of manifestations in the oral cavity as a result of the stomach acids in the mouth, as well as many nutritional shortages. These lesions are obvious and easy to examine, and pediatric dentists may be the first health professionals who are able to suspect a food-related disorder.

*Objectives:*

—To describe the clinical characteristics and principal oral manifestations in patients with anorexia and bulimia.

To explain what attitude should be adopted by pediatric dentists dealing with these patients, and to highlight the importance of an early diagnosis of the lesions at an oral level in order to improve the prognosis.

*Material and method:* A search was made in the literature and articles were obtained through the Pubmed and Medline databases. The inclusion criteria were: the English language and the year of publication, choosing

those between the years 1996 and 2011. The keywords used were: Anorexia and bulimia in children, oral manifestations and clinical strategies.

*Conclusions:*

—The most common oral manifestations in these patients were dental erosion, hypertrophy of the salivary glands and xerostomia as a result of acids being present for more time in the oral cavity and self-induced vomiting.

—Pediatric dentists should be able to identify the main oral lesions. Depending on the age of the patient, they should make parents aware of their suspicions, establish preventative measures and provide the necessary treatment for improving oral health quality.

## 61. DENTAL TREATMENT FOR PEDIATRIC ONCOLOGY PATIENTS

**Domínguez G, Martínez E.M., García L, Lázaro M, Planells P**  
*Universidad Complutense de Madrid*

*Introduction:* Neoplasms in children have acquired over recent years increasing relevance in the area of pediatrics. Moreover, there has been a spectacular improvement in the treatment of pediatric cancer, with long term survival rates that mean that these patients require greater medical-health care at all levels. Dentists are now faced with the challenge of prevention, diagnosis and the right treatment of the oral pathology, generally a side effect of cancer therapy, and which may be on occasions inherent to the neoplasm.

*Objectives:* To study the main repercussions at an oral level that are suffered by pediatric cancer patients, their dental treatment, and prevention strategies that can be used for minimizing these repercussions.

*Material and methods:*

A review of the scientific literature published over the last ten years in various data bases. Keywords: “Chemotherapy”, “Radiotherapy”, “Children”, “Cancer”, “Dental care”, “Oral Mucositis”.

*Conclusions:*

—Oral pathology in cancer patients arises during both the active anti-neoplastic period as well as afterwards, and a follow-up is necessary in order to avoid a worsening of the clinical condition and the quality of life of the patient, and the increase in the risk of suffering infections.

—The role of the pediatric dentist is fundamental for setting up orodental prevention protocols in order to reduce the presence and severity of these oral disorders.

—In order to carry out safe dental treatment pediatric dentists should cooperate closely with the pediatric cancer unit.

## 62. DSP AS MARKERS FOR ODONTOBLASTS IN DENTIN REGENERATION

**Hernández A, Cuesta L, Barbería E**  
*Universidad Complutense de Madrid*



**Introduction:** During the life cycle of a tooth, pulp tissue contributes to the production of secondary dentin, peritubular dentin (sclerosis) and reparative dentin in response to pathological stimuli. Therefore the success of pulp capping depends on the preservation of vital pulp tissue and the formation of dentin bridges. The object of pulp exposure treatment is to stimulate the dentinogenetic potential of pulp cells. Despite the progress that has been made in understanding the molecular mechanisms that control the differentiation of odontoblasts and the formation of dentin bridges, the exact healing mechanism and the nature of the hard tissue that is formed after the exposure of dental pulp, has not been sufficiently clarified.

During the formation of dentin, the odontoblasts synthesize and secrete various non-collagenous proteins into the extracellular dentin matrix, derived from the DSPP gene. The sialophosphoprotein of DSPP dentin is principally expressed in odontoblasts and it is known that it is a differentiation marker for undifferentiated mesenchymal cells that are present in the pulp of odontoblasts. It is also known that they are expressed in many other tissues but in much smaller quantities. The dentin sialoprotein DSP is a glycoprotein that is expressed exclusively by odontoblasts and it has been used as a marker for odontoblasts. After an experimental introduction of reparative or tertiary dentin D'Souza et al. observed that odontoblastic replacement cells expressed DSP, unlike surrounding tissues.

**Objectives:** The objective of this work was to revise molecular mechanisms regarding the formation of dentin bridges, and to evaluate their clinical application.

**Material and methods:** A literature search was carried out using the databases Sciencedirect, Medline and Compludoc, using the keywords dentin bridge, MTA, DSP, marker and pulp capping, and restricting the search to the last ten years.

**Conclusions:** Given the advances in studies on markers that permit identifying tertiary dentin tissue, it may be possible to promote the development of new materials that are able to prompt activity and encourage dentin pulp cells to generate repair dentin. At the same time more details are now known on the dentinogenesis process, mediators and the many strengths of stem cells in dental pulp.

### 63. RIMAX PROJECTION GLASSES AS A METHOD OF DISTRACTION IN PEDIATRIC DENTISTRY

**Martínez X, Guinot F, Yuste S, Cuadros C, Lorente AI**

*Departamento de Odontopediatria. Universitat Internacional de Catalunya*

**Introduction:** Research related to audiovisual material as a method of distraction has been scarce over recent years, despite changes in current society. The objective of this work was to evaluate if behavior, anxiety and pain in children improved with the use of Rimax® projection glasses as a method of distraction during dental treatment.

**Material and methods:** The study group consisted of 29 patients, aged 4-9 years, who required a minimum of two visits for restoration or pulp treatment, and who had previously shown disruptive behavior in this Pediatric Dentistry Department. The study consisted in a control visit and an experimental visit in which the necessary dental treatment was carried out in each case. During the second visit (the experimental visit), the patient saw a cartoon film of his own choice.

**Results:** Statistically significant differences were found ( $P = 0.04$ ) with regard to the perception of parents on the anxiety of their children during both visits. A large part of the sample (96.5%) indicated that they had enjoyed viewing the cartoon film during the second treatment visit and that they would like to continue seeing films on subsequent visits. Statistically significant differences were not found ( $P > 0.05$ ) between the other variables studied on both visits (anxiety perceived by the patient himself, pain felt by the patient during the treatment, global behavior of the patient and heart rate evaluated at different moments of the treatment).

**Conclusions:** Rimax® projection glasses do not produce and improvement in global behavior, anxiety, pain or heart rate of patients during dental treatment. However, this distraction method is highly accepted by children.

### 64. PULPECTOMIES IN THE PRIMARY DENTITION WITH A ONE FILE SYSTEM

**Boo P, Álvarez T, González F, Sebastián, P. Ribelles M**

*Universidad Cardenal Herrera CEU*

**Introduction:** Advances in instrumentation techniques and improvements in the properties of root canal obturation material, has meant that in recent years there has been an increase in pulp treatment success in the primary dentition.

In order to carry out root canal treatment in a primary tooth, the canals have to be properly cleaned and shaped. Traditionally, root canals were shaped by preparing them with manual steel files. Recently Ni-Ti rotary files have been developed for use in the field of endodontics. The flexibility and design of the instrument offers certain advantages over conventional files, as the original shape of the duct is maintained during preparation, there is a greater cutting capacity and a reduction in work time.

Oscillatory systems represent another advancement in the use of Ni-Ti files for pulp treatment. By changing the kinematics from a rotation to an oscillation movement, the use of Ni-Ti files can be limited to just one file without increasing fracture risk and reducing working time.

**Objectives:** To describe this oscillatory system and its application in the pediatric dentistry office.

**Material and methods:** A literature search was made in the Dental Faculty of the University of Valencia and in the databases of PubMed and Medline using the keywords: pulpectomy, root canal treatment, reciprocation,

rotation. Articles between the years 2000 and 2012 were included. A case report is presented of a 4-year old patient who attended the Dental Faculty of the UCH-CEU with pulp necrosis. Root canal treatment was carried out with an oscillatory one file system (Reciproc,VDW).

*Conclusions:* The oscillatory system reduces the number of Ni-Ti rotary instruments that are necessary for preparing root canals, and simplifies the technique with regard to other NI-Ti instrumentation techniques. The use of a single file reduces the clinical work time which makes carrying out root canal treatment in pediatric dentistry patients worthwhile.

## 65. BEHAVIOR MANAGEMENT OF PEDIATRIC DENTISTRY PATIENTS

**Ávila D, Vilar C, De Nova j, Perdomo N, Diéguez M.**  
*Universidad Europea de Madrid*

*Introduction:* The behavior management of child patients is an integral part of pediatric dental practice and it aims to achieve patient cooperation during pediatric dental treatment.

For the American Academy of Pediatric Dentistry (AAPD) the basic techniques that are acceptable for behavior control are: tell-show-do, voice control, non-verbal communication, positive reinforcement, distraction, presence/absence of parents, inhaled nitrous oxide. And the advanced techniques are: hand-over-mouth, physical restriction, sedation and general anesthesia.

### *Objectives:*

—To evaluate the attitude of the parents of pediatric dentistry patients towards the different behavior control techniques.

—To describe the different opinions by pediatric patients on behavior control techniques and to evaluate the use of each of these.

—To describe the different opinions of pediatric dentists on behavior control techniques and to evaluate the use of each of these by the pediatric dentists themselves.

—To study the education programs in the dental faculties on behavior control techniques and to evaluate the opinion of students on these.

*Materials:* Five articles were analyzed on the attitude of parents, four that analyzed the response of pediatric dentistry professionals and six on students and directors of the dentistry programs.

*Literature review* was carried out using the databases of PubMed, Medline and Compludoc from between 1984 and 2011. The keywords were: hand-over-mouth, behavior management, dental education, pediatric dentistry, child behavior guidance, parent's attitudes.

*Conclusions:* The techniques hand-over-mouth and voice control are the least accepted by parents. The parents of patients with special needs accepted behavior control techniques better. Pediatric dentists valued voice control techniques more favorably compared to parents. There were no statistically significant differences regarding opinions on behavior management techniques among pediatric dentists with different ages and sex.

Although the hand-over-mouth technique was taught in dental education programs, students did not use these in daily practice.

Undergraduate education programs influence the opinion of dental students considerably. Most of the directors of dental programs, of both undergraduate and postgraduate students, do not accept the technique hand-over-mouth on their educational program.

## 66. RELATIONSHIP BETWEEN BODY MASS INDEX AND DENTAL CARIES IN A POPULATION OF SCHOOLCHILDREN

**Serna DS, Marqués L, Borrell C, Carmona M, Ribelles M**  
*Universidad CEU Cardenal Herrera*

*Introduction:* The rate of consumption of food and drink that contain fermentable carbohydrates constitutes one of the most important risk factors in the development of dental caries. Studies carried out by the Spanish Foundation of Nutrition report that the consumption of sugary buns, luncheon meat, drinks and other sugary products has increased in Spanish children who are aged 6 to 12 years. At the same time, a sedentary lifestyle is more common in this population type, as this life style reduce the practice of sport. According to the WHO, 26.1% of the Spanish population who are aged 2 to 24 years are overweight. With regard to the analysis of these last figures, we should stress that there are studies that link diet and Body Mass Index (BMI) and caries.

*Objectives:* To analyze the relationship between diet and BMI.

*Material and Methods:* A review of the literature was carried out using the databases of PubMed and Medline with the keywords: dental caries, body index, obesity.

*Conclusions:* Many studies show a positive association between caries and BMI increase. Diet is an important factor in the increase in BMI and caries risk.

## 67. SUBGINGIVAL MICROBIOLOGY IN CHILDREN

**Martin F, Sanjurjo S, De Nova MJ**

*Introduction:* The presence of bacteria microorganisms in subgingival plaque of primary teeth in children is considered the primary factor leading to the development of periodontal disease in the permanent dentition.

### *Objectives:*

1. To carry out a systematic review according to the Cochrane Collaboration methods: microbiological composition of subgingival plaque in children.

2. To review the methodological factors used in each study.

3. To determine the composition and prevalence of certain species of bacteria at the different dental stages.

*Material and methods:* Search strategy: The search was carried out using electronic databases such as Medline and Cochrane (from 1984-2011).

The search was limited to two languages, Spanish and English and the following keywords and MESH terms were used (Tables I and II):

TABLE I

## SEARCH METHODS. MESH TERMS

MESH Terms		
1. Dental plaque/microbiology	3. Child	5. Age factor
2. Gram-negative bacteria(classification)		4. Dentition, mixed

TABLE II

## SEARCH METHOD. KEYWORDS

Key words		
1. Subgingival plaque	3. Child	5. Mixed dentition
2. Colonization	4. Primary dentition	6. Periodontal pathogens

*Selection criteria:* Original study samples that included children between the ages of 0 and 18 who did not have any systemic disease.

A total of 36 studies were included with differing results on the various dentition stages in relation to bacteria colonization of the subgingival plaque in children.

*Conclusions:* There are different findings on the composition of subgingival microbiota in children aged 0 to 18 years.

—Sterile paper tips are the most used technique for collecting subgingival samples.

—The detection of the first bacterial species is during the first month of life.

—The prevalence of periodontal pathogens rises as age increases.

—Most authors highlight the presence of the red complex species in the primary dentition and colonization by *A. actinomycetemcomitans* in the mixed dentition.

## 68. PREVALENCE OF MALOCCLUSION AND RELATIONSHIP WITH ORAL HABITS

**Pérez L, López C, Bartolomé B, Correa E, Moreno P**

*Introduction:* Habits are acquired practices that consist in the frequent repetition of the same act, which in principle is done in a conscious fashion and then unconsciously. They are classified into physiological habits, those that are born with the individual, such as sucking mechanisms, nasal breathing, swallowing, and those that are not physiological, that exert pernicious forces on the teeth, dental arches and soft tissues, among which is finger sucking, atypical swallowing and oral breathing.

The importance of these parafunctional habits lies in that they constitute one of the most important environmental factors of malocclusion. The distortion caused

will depend mainly on the age at which the habit is started, the frequency and the duration of the habit.

*Objectives:* The aim of this literature review was to study the relationship between harmful oral habits and the appearance of different malocclusions, and to study the different materials and methods that the authors have used to reach their conclusions.

*Material and methods:* A search was made of the databases: Medline (EBSCO), Medline (OVIDSP) and PubMed. The keywords were: malocclusion, oral habits, digital sucking, pacifier sucking, oral breathing, tongue thrust.

*Conclusions:*

1. Oral habits such as digit or pacifier sucking, atypical swallowing and oral breathing can modify the position and relationship of the teeth, as well as the shape of the dental arch, as they interfere in the normal growth and function of the orofacial muscles.

2. It was confirmed that children with anomalous oral habits had a greater possibility of developing malocclusions.

3. The disorders related to anterior openbite, posterior crossbite, overjet increase, disto-occlusion, compression of the maxilla, protrusion of upper incisors and retro-inclination of the lower incisors, are related to the presence of oral habits.

4. The high frequency of malocclusion indicates a need for the early detection of bad oral habits, and of starting interceptive treatment that limits or corrects the orofacial repercussions that these produce.

## 69. THE POTENTIAL OF DENTAL PULP STEM CELLS FOR BONE REGENERATION

**Gutiérrez N, González E, Huertas MD, Iglesias A, Mendoza A**

*Universidad de Sevilla*

*Introduction:* A postnatal stem cell possesses self-renewing, multipotent and quiescent properties that enable it to differentiate into different cell types with a diverse embryonic origin. In physiological or experimental conditions postnatal cells can arise that are differentiated into tissues or organs with specific functions. The therapeutic potential of this type of cell has led to a new field emerging, that of Regenerative Dentistry based on stem cells with a dental origin. Stem cells can be obtained from different specialized tissues in the body. In dentistry five sources of different cells have been established: dental pulp stem cells (DPSCs), periodontal ligament stem cells (PLSCs), dental follicle stem cells (DFSCs), stem cells from apical papilla (SCAPs), and stem cells from deciduous teeth (SHED). Given the availability of these last stem cells, studying and characterizing them is of great interest to the dental world.

*Objective:* To carry out a systematic revision of the literature in order to compile and analyze critically the information published on the bone regenerative capacity derived from these types of cells with a dental origin.

*Material and methods:* The data were obtained from the electronic databases of PubMed, Scopus, Embase

until March 2012. The studies were chosen by a single examiner based on previously established inclusion/exclusion criteria. The methodological quality of the studies was classified as high, medium and low quality (HQ,MQ,LQ).

*Results:* The search strategy led to 45 articles. After applying an inclusion criteria, 30 articles were chosen which were filtered according to the abstract. After screening and selection, 22 other studies were excluded. The quality and sample of the study, clinical and radiological results, and the success rate was reduced to 8.

*Conclusions:* Stem cells from the pulp of either primary or permanent teeth have the capacity of differentiation into osteoblasts which permits encouraging experimental bone formation in vivo and in vitro in controlled conditions. There are, however, no random solid clinical trials, and scientific evidence with a clinical application which is more than just experimental, is scarce. But this would enable establishing with reliability and efficiency the usefulness of these cells as a clinical alternative for bone preservation today.

## 70. RETAINED PRIMARY TEETH: IMPLICATIONS AND CLINICAL MANAGEMENT

**García L, Cuesta L, Hernández A, Reolid N, Barbería E**

*Universidad Complutense de Madrid*

*Introduction:* Dental eruption includes all the movements that a tooth undergoes during its formation and active life. It entails a long, physiological process that can be disturbed by a number of congenital or environmental reasons. Retained teeth that have failed to erupt are very uncommon in the primary dentition. The retention can be primary because the tooth fails to erupt, or secondary when the tooth erupts but impacts. This type of eruptive disorder can seriously affect the development of occlusion, and treatment should be started as quickly as possible.

*Objectives:* The aim of this work was to revise the current information available on retained teeth in the primary dentition, with regard to prevalence, etiology, diagnosis and treatment.

*Material and methods:* A search was carried out of scientific articles in the databases of PubMed and Medline. The keywords used were: eruption primary molars, failure dental eruption, retention primary teeth. The inclusion criteria were articles published from 2001 to date, as well as those written in English and Spanish. The information analyzed was contrasted with various case reports in the Pediatric Dentistry course of the Universidad Complutense de Madrid.

*Conclusions:* Despite the prevalence of dental retention in the primary dentition being low, it is felt that it is more than previously thought. The reason is that retained teeth often go unnoticed and the diagnosis is not always made because the tooth is normally asymptomatic, it does not always appear on intraoral radiographies and the tooth is often retained deep down.

Multiple reasons have been given on the origin of dental retentions, but they are largely unknown. The clinical manifestations, relevance of the problem and implications on craniofacial growth and development of occlusion can be very different, meaning that individual treatment plans have to be made.

Treatment and clinical management depend on various variables, and any repercussions on the growth and development of the patient have to be evaluated. The extraction of the retained tooth and posterior management of the space is, in most cases, the treatment of choice, especially regarding retention of primary teeth.

## 71. DENTAL TRAUMA IN CHILD PATIENTS. PERIODONTAL LIGAMENT INJURIES

**Briceño S, Gómez A, Correa E**

*Universidad Europea de Madrid*

*Introduction:* Traumatic dental injuries are very common in the primary dentition and it could be said that one in two children will experience some type of trauma, with early infancy being the riskiest period.

These traumas could be defined as a force on the mineralized tissue of a tooth that is able to produce a stress reaction that is beyond the biomechanical resistance of the oral structures.

The traumas we will cover are those that affect the periodontal ligament and they are: concussion, subluxation, intrusion (central luxation), extrusion (peripheral luxation), lateral luxation and total luxation or avulsion.

*Objectives:*

1.- To study the etiology and epidemiology of these traumas concentrating on certain factors.

2.- To make a correct diagnosis by studying the six types of periodontal ligament trauma.

3.- To analyze the types of treatment possible.

*Material and methods:* The study was carried out by gathering together the information from scientific articles in different journals.

*Results:* There are numerous factors that can cause trauma. We should keep in mind that a traumatic injury affects various tissues and it is not limited to a single anatomic structure. Among the predisposing factors we will find falls and knocks, abuse, sport, traffic accidents, injuries due to epileptic fits and also children who are mentally and psychomotor handicapped

We will concentrate especially on the incidence and prevalence of these cases and we will analyze the protocols to be followed when treating these types of traumas.

*Conclusions:* It would appear that in recent years more traumatic injury cases have been reported in child patients due to the practice of extreme sports. Emotional state appears to be a predisposing factor as well as violence.

## 72. UPDATE ON PEDIATRIC DENTISTRY SPLINTS

**Barreiro S, Albericio M, Pines B, Maroto M, Barbería E**

*Universidad Complutense de Madrid*

*Introduction:* Suffering a traumatic injury at a young age is very common and these injuries represent an emergency for pediatric dentists. It is therefore necessary to be familiar with the different types of splints that are considered biologically appropriate. These are currently classified into flexible splints (that allow greater mobility than what is normal for a tooth), semi-rigid splints (that allow normal mobility of a tooth) and rigid splints (that allow less mobility than normal).

All splints should have a series of biological and technical requirements.

The injuries that tend to require splinting are extrusions, lateral luxations and avulsions. When faced with any of these lesions we have to decide what type of splint should be used, and we have to be familiar with the characteristics of the splint, placement techniques and removal.

*Objectives:* The objective of this study was to carry out a literature review on the different types of splints that are suitable for young permanent dentition after a traumatic injury, and to become familiar with how to place and remove these.

*Material and methods:* A search was made of the literature in the library of the Dental Faculty of the Universidad Complutense de Madrid and the databases of PubMed and Medline, on the different types of splinting that there is in dentistry for dental trauma. We have used images of cases treated on the Pediatric Dentistry course held at the Universidad Complutense de Madrid and the dental care program for child patients.

*Conclusions:* The types of splints that should be used with traumatic injuries requiring fixation are semi-rigid or flexible splints and these should be properly placed. Within the group of semi-rigid splints, the titanium splint is today one of the best options for fixing traumatized teeth. Rigid splints should not be used. Splinting for too long can deteriorate the healing process, leading to ankylosis.

### 73. THE MOTIVATIONAL INTERVIEW I: INTRODUCTION

**Almazán L, Frechina N, Catalá M**

*Clínica Odontológica. Universitat de València*

*Introduction:* Orodonal health is closely linked to a person's habits, but it is admitted that in questions of health it is, not what the person knows, but what they do that is important. For this reason motivating people to adopt healthy habits is essential with regard to prevention and to maintaining good oral health. The need to have different strategies for motivating patients in the dental office has led to new techniques in areas such as medicine and psychology. The Motivational Interview is a resource that aims to direct patients and motivate them so that they are the one that make the change towards healthy habits. This strategy arose in 1983 (R. Miller) as a model to help alcoholics who lacked motivation and who wanted to abandon this harmful habit. It is a type of direct assistance centered on the patient, that aims to achieve and reinforce a desire for change.

*Objectives:* To present the origins, bases and principles of the Motivational Interview.

*Method:* A review of the literature was carried out using Pubmed, Scopus, Medline, IME, and Goggle academic with no date limit. 24 literature references were reviewed. The keywords were: interview, motivational/motivation, interview/interviewing.

*Conclusions:* The Motivational Interview is a strategy that aims to motivate patients by guiding them towards healthy habits, using various resources, such as open questions, reflective listening and self-motivational affirmations in order to avoiding any resistance to change.

### 74. THE MOTIVATIONAL INTERVIEW II. APPLICATION IN PEDIATRIC DENTISTRY

**Frechina N, Almazán L, Catalá M**

*Clínica Odontológica. Universitat de València*

*Introduction:* The health problems that are currently affecting society require the cooperation of patients if a change towards healthier habits is to be achieved. In primary care we have seen the need to motivate these patients but we have a limited time for action.

The Motivational Interview is aimed at directing patients and motivating them so it is the patients themselves who insist on making the change to healthier habits. The effectiveness of the Motivational Interview in brief sessions is comparable the more extensive form. The Brief Motivational Interview (Miller and Rollnick) has, as a result, been proposed as a viable approach for outpatient treatment.

In dentistry this has started to appear in the areas of Periodontics and Pediatric Dentistry with encouraging results.

*Objectives:* To present the structure and keys behind the Brief Motivational Interview so that it can be incorporated into Pediatric Dentistry clinics as a motivational method that will encourage change in the parents of those children who follow unsuitable oral hygiene and dietary habits.

*Method:* A review of the literature was carried out in Pubmed, Scopus, Medline, IME and Google academics, with no time limit. 15 articles were found 8 of which were clinical trials, 1 a systematic review and 6 were descriptive articles.

*Keywords:* Motivational/motivation, interview/interviewing, dentistry, pediatric.

*Conclusions:* The Brief Motivational Interview is an effective method that encourages parents and caregivers to prevent caries in their children. It is a promising approach that requires some changes in order to adapt it to the real context of the pediatric dentistry clinic.

### 75. ODONTOMAS: DIAGNOSIS AND THERAPEUTIC APPROACH

**Albericio M, Pinés BI, Barreiro S, Gallardo N, Barbería E**

*Universidad Complutense de Madrid*

*Introduction:* Currently odontomas are considered development anomalies or disembryoplasias that have all the tooth's tissues on their inside. Their etiology is unknown, nevertheless, the etiopathogenic theory that is most accepted is that odontomas are formed from the enamel organ or dental lamina. They are the most common tumors of the jaws with a rate that varies between 22% and 67%, appearing predominantly in children and adolescents. The anatomopathological classification of the World Health Organization is of complex or compound odontomas.

*Objectives:* Our objective was to find out the clinical and histological characteristics of odontomas in order to carry out a suitable diagnosis and treatment plan of this pathology.

*Material and methods:* In order to carry out a review of the literature a search was made of the databases of Compludoc, Medline and Pubmed, and of articles and books on Pediatric dentistry and Oral and Maxillofacial surgery that were published in the last 30 years, in English and Spanish, that were in the Dental Faculty of the U.C.M. library. The keywords used were: odontoma, compound odontoma, complex odontoma.

The case report is presented of a compound odontoma that was located in the fourth quadrant of a girl aged 8 years and six months.

*Conclusions:*

1. Complex odontomas have a low degree of differentiation and clinically they appear as a hard, solitary amorphous tumor masses.
2. Compound odontomas have a greater degree of differentiation and clinically they appear to have denticles and well differentiated multiple formations.
3. They do not give rise to serious symptoms but they can prove to be an obstacle in the eruption of permanent teeth, leading to primary teeth persisting, the expansion of alveolar bone and the absence of the permanent tooth. Only on these occasions will we find pain, infection and regional adenopathy.
4. The diagnosis is by chance during a routine radiography. A scanner will provide detailed information, improving the precision of the treatment.
5. The treatment of choice is the extraction of the odontoma together with curettage of the area and only on rare occasions will it recur.

## 76. ORAL APHTHAS. ARE THEY UNDERESTIMATED INDICATORS OF SYSTEMIC DISEASE?

**Pinés BI, Albericio M, Barreiro S, Hernández A, Barbería E**

*Universidad Complutense de Madrid*

*Introduction:* Recurrent aphthous stomatitis (RAS) is the most common form of oral ulcer, and its incidence is estimated to be 15% of the child population. It is a chronic disease with an inflammatory nature, which is characterized by the appearance of one or various painful ulcers in the oral mucosa. They persist for days or weeks and they reappear after variable remission periods. They are typically round or ovoid lesions that

are well-defined, covered by white or grayish yellow exudate, and surrounded by a regular erythematous halo. Depending on how they present three clinical shapes can be distinguished: minor (most common), major and the herpetiform. In addition, according to the number of recurrences, this pathology is divided into simple or complex. Its etiology is unknown, although numerous factors have emerged that could be related: genetic, immune, hematic deficiency, and emotional and traumatic factors. In addition, in a considerable number of cases these lesions are associated with an underlying systemic pathology. The treatment is asymptomatic but before introducing a specific therapy, eliminating or treating any predisposing factor, such as underlying disease, is essential.

*Objectives:* To describe the various systemic pathologies that arise with recurrent oral aphthous, as on many occasions they are the first and only manifestation of the disease. They are therefore a useful tool as they enable the early diagnosis of this pathology, and later complications are avoided.

*Material and Methods:* A review of the literature was carried out and the databases of Pubmed, Compludoc and Scielo were examined and a manual search was made of books on Oral Medicine and Pediatrics in English and Spanish published over the last 10 years. The keywords were: recurrent aphthous stomatitis, oral thrush, treatment, systemic diseases, oral manifestations.

*Conclusions:* Various systemic pathologies such as: digestive diseases (celiac disease, Crohn's disease, ulcerous colitis); autoimmune diseases (Behçet's disease, lupus erythematous) and hematologic diseases (cyclic neutropenia myelodysplastic syndromes and periodic syndromes, among others) evolve with recurrent oral aphthous. Therefore patients with frequent episodes of these types of sores might need to consult a specialist, given the need for carrying out complementary tests that will rule out an underlying disease.

## 77. EARLY TREATMENT FOR MYOFUNCTIONAL HABITS USING THE INFANT TRAINER.

**Hurtado V, Gallego A, Pérez F**

*Introduction:* The normal growth and development of a child is as important as his health and education. Children develop faster between the ages of 2 and 5 years. During this period 70% of the growth of the face and jaws takes place.

The childish instinct of chewing objects is a stimulus for jaw growth, but modern diets do not meet this in a suitable manner as there is an absence of hard food that encourages exercise and correct development. This results in bad myofunctional habits that then lead to unsuitable facial growth.

With early use of correction apparatuses for these habits, we can ensure that children reach their greatest growth potential.

*Objectives:* To inform of the function and benefits of the Infant Trainer for correcting myofunctional bad habits.

*Material and methods:* The information published in articles and journals on the Infant Trainer will be reviewed.

*Conclusions:* Oral breathing, atypical swallowing and digital sucking contribute to the development of dental problems. The Infant Trainer permits active exercise that encourages correct mastication, and the use of the masticatory muscles. It forces the child to breathe through the nose, training him to swallow with the tongue in the correct position and this will allow proper facial and maxillary growth.

## 78. PEDIATRIC DENTISTRY FOCUS ON THE ERUPTION FAILURE OF PERMANENT MOLARS

**León C, Muro V, Saavedra G**

*Introduction:* The terminology used for describing the eruption failure of permanent molars is very wide and it includes: infraocclusion, incomplete eruption, secondary retention etc. The phenomenon describes the abnormal position of the erupted permanent molar, underneath the occlusal plane, at an age when it should be in contact with its antagonist, with the latter being in a correct position for eruption.

Pediatric dentists have to look for prosthetic-restorative solutions in order to avoid the displacement of adjacent and antagonist teeth if these molars cannot be extruded orthodontically. The low prevalence of these cases means that procedure protocols should be tailored to each patient, and that these should be conditioned by the response of the patient to orthodontic treatment.

*Objectives of the presentation:* To bring Pediatric Dentists closer to this rare and sometimes complicated pathology.

*Material and methods:* A literature search was carried out using Medline and Pubmed using the following keywords: “ankylosis”, “infra-occlusion”, “submergence”, “incomplete eruption”.

*Conclusions:* The failure of permanent molars to erupt represents a phenomenon which today has a complex diagnosis and treatment. The lack of knowledge regarding some of the phenomena that accompany this eruption process makes choosing the best treatment for this pathology more difficult.

The therapeutic options for eruption failure depend on the age of the patient, degree of infra-occlusion and of the response of this molar to previous treatment.

## 79. A DENTAL TREATMENT PROTOCOL FOR PATIENTS WITH EPIDERMOLYSIS BULLOSA

**Del Barrio MP, Beltri P, Zuluaga O, Planells P**

*Introduction:* La epidermolysis bullosa (EB) is an inherited genodermatosis that affects epithelial integrity. It has typical boils and vesicles on the skin and mucosa which are formed following minimal trauma. EB is a disease with a high prevalence forming part of

the so-called rare diseases group. Since its prevalence is low, health professionals tend not to have much experience of it, nor do they have sufficient training regarding caring for and monitoring these patients.

Three types of epidermolysis bullosa can be distinguished depending on the level of boil formation: EB simplex, junctional, and dystrophic.

*Objectives:* To define and describe the etiopathogeny, diagnostic methods, classification and general clinical characteristics of epidermolysis bullosa.

—Oral clinical manifestations of epidermolysis.

To establish a dental treatment protocol for these patients.

*Material and methods:* In order to carry out this study we carried out a review of the main databases: Medline, PubMed; and the information available on the clinical manifestations and dental treatment of epidermolysis bullosa over the last 20 years using the keywords: epidermolysis bullosa, junctional epidermolysis bullosa, dystrophic epidermolysis bullosa, blistering epidermolysis. The search was made up until December 2011.

*Conclusions:* Following a literature review we have described the clinical manifestations of the different types of epidermolysis bullosa, stressing the oral clinical manifestations. This information on the oral manifestations has enabled us to elaborate a preventative and restorative protocol for dental treatment in addition to elaborating some guidelines for minimizing the appearance of lesions as a consequence of dental treatment.

## 80. ORAL LESIONS IN CHILD ABUSE

**Mares C, Boj JR**

*Introduction:* Child abuse and neglect are an increasing social problem with implications that are not just limited to legal areas or to the social services, but also to medicine and dentistry. Given the defenselessness of children and the legal obligations of the Spanish State, dentists should be aware of the magnitude of the situation in order to work in the interests of the health, and even life, of a child.

*Objectives:* The objective of this work was to describe the lesions of the oral cavity and highly suggestive signs that are characteristic of abuse and which will help dentists make a correct diagnosis when coming across cases of child abuse.

*Material and methods:* In order to carry out this review a search of the literature was carried out using Medline and PubMed of indexed articles using the keywords: Child abuse, oral lesions, neglect and diagnosis.

In addition photographic documentation of lesions is presented of casuistry from the Hospital Sant Joan de Déu in Barcelona.

*Conclusions:* Dentists play a very important part in the diagnosis of child abuse given their experience in evaluating oral lesions and because they are able to identify injuries that suggest abuse or other possible causes.

## 81. MOLAR INCISOR HYPOMINERALIZATION. HOW PREVALENT IS IT?

López FM, Muñoz SR, Boj JR, Espasa E, Hernández M

Universidad de Barcelona

*Introduction:* The definitive prevalence of MIH is still to be properly documented. In the past various classifications have been used for diagnosis. The prevalence appears to vary from 3.6% to 25% in European countries. Up until now there are no data on prevalence in the United States and Canada and many other countries of the world.

### *Objectives:*

—To discover the different prevalence indexes of MIH in different countries, zones and regions in the world.

—To analyze why the prevalence of MIH varies so much in the literature investigated.

—To find out the diagnostic criteria that is most valid for correctly identifying the prevalence of MIH.

*Methods:* An extensive search was made of the PubMed database. Articles published in English were chosen using the keywords: MIH, prevalence, epidemiological study. This was analyzed according to the country, region, year and type of study, size of the sample, age ranges and prevalence percentage. An analysis of lineal regression was carried out using the prevalence found in the studies chosen.

*Conclusions:* The prevalence found in Europe was 13.62% according to the studies carried out. In Asia this was 12.78% and in Africa this was 2.9%, in Oceania 22% and in South America 25%.

The studies published in the year 2009 presented the highest percentage of MIH at 40.20%.

In Europe, the country with the highest prevalence of MIH was Denmark with 25%.

In South America, the percentage of MIH was 29.55% in Brazil.

Comparing the results of the studies is difficult due to the use of indexes and different criteria, variability of analysis, the selection methods and the different age groups.

## 82. ARE WE REALLY FAMILIAR WITH THE ETIOLOGY OF MIH?

Muñoz SR, López F, Boj Jr, Espasa E, Hernández M.

Universidad de Barcelona

*Introduction:* Of the structural defects of enamel, hypomineralization has only been observed in permanent first molars and incisors (MIH, PFM and PI) and it has characteristic clinical, histological and physical features. According to studies it has a prevalence of 2.4-40.2%. MIH is related to various factors that may be individual, combined or in synergy which can produce health disorders. It represents a problem in pediatric dentistry because of treatment sensitivity and inconve-

nience: difficulties with anesthesia, behavior management, quality of the restorations or extractions.

*Objective:* To investigate the likely etiological factors of MIH, the evidence that supports and the evidence that does not this.

*Material and methods:* A systematic review of the Medline database was carried out using the words: MIH, Molar-incisor-hypomineralisation, Molar hypomineralisation, MIH AND: Molar incisor hypomineralisation, prevalence, severity, aetiology, ultrastructure and biochemistry, treatment, clinical characteristics or Children; Dioxin, Dental development, Enamel defects, Cheese molars, Idiopathic enamel hypomineralisation, Non-fluoride hypomineralisation, Aetiology (etiology) and molar incisor hypomineralisation, Amoxicillin, PCDD, PCB, TCDD, Developmental dental defect, DDE, Enamel hypomineralisation; with and without the filter "Dental journals". The abstract of each article was read and those that were more relevant were kept to be read in full. In addition the reference lists were evaluated. Studies on hypoplasia, fluorosis, extrinsic or intrinsic pigmentation were excluded. In addition books on Pediatric Dentistry that referred to the subject were evaluated. A total of 64 documents were selected in English and Spanish that had been published between 1989 and 2012.

*Conclusions:* The etiological factors discussed in the literature do not show a cause and effect relationship with MIH that can confirm them as such. It is known that the critical period that produces enamel defects in PFM and PI is during the first year of life, coinciding with the start of maturation. Although maturation covers various years (late maturation), MIH could therefore develop later, and involve the first 3 years of life.

Probably many factors act simultaneously. In humans studying the effects of multiple factors is difficult. Prospective studies should be carried out that include the environment and the medical history of a mother during pregnancy; of the mother and child during birth and breastfeeding; of the child during the first three years of life. The eruption of the permanent teeth of these children should be followed until they are all replaced (12 years), in order to rule out or confirm the likely etiological factors.

## 83. INFLUENCE OF PERIODONTITIS IN THE APPEARANCE OF COMPLICATIONS DURING PREGNANCY

Quintero MA, Moreno M, San Martín L, Castaño A

*Introduction:* During pregnancy, the hormonal changes in a woman's body produce a series of systemic modifications that are of great importance. Estrogens and progesterone play a fundamental role in the appearance of disorders in the oral cavity. The vasodilatation of the gingiva, the reduction of keratinized epithelium, the development of aerobic and anaerobic bacteria, transitory immunosuppression and salivary disorder, lead to a predisposition of periodontitis in pregnant women. Maternal periodontitis could lead to



premature births and newborns with a low birth weight. Offenbacher stipulated that the spreading of periodontopathogenic species towards the uterus, the hematogenous spread of cytokines in periodontal disease towards amniotic fluid, and the appearance of antibodies against periodontopathogenic bacteria, are the main reason behind the appearance of complications in newly born babies.

*Objectives:* To evaluate the relationship that exists between maternal periodontitis and the possible appearance of complications at birth (premature births and newborn babies with a low birthweight).

*Material and methods:* A review of the literature was carried out using the databases of PubMed and Cochrane. The keywords used were: periodontal disease, pregnancy, preterm birth, low birthweight. Revision period: 2001- 2012.

*Results:* There are various opinions of this subject. Many authors have investigated the possible relationship between periodontitis and the appearance of complications in the newborn. Some investigations show that periodontitis is a risk factor in the appearance of complications during birth (Scamapieco, 2003. Khader and Ta'ani, 2005. Vergnes and Sixou, 2007.). Other authors claim that there is no relationship at all (Moore, 2005. Bryan, 2006. Vettore, 2006. Chambrone, 2011. Devempont, 2011). Recent investigations claim that, despite the results that have already been obtained, carrying out more studies is necessary in order to obtain conclusions that are more reliable on the true relationship between periodontitis and complications in newborn babies. (George, 2011. Madianos, 2002. Xiong, 2006. Manau, 2008. George, 2011.)

*Conclusions:* More studies are required for establishing the true relationship between periodontitis and complications in newborn babies. Common criteria and using similar populations should be established in future investigations. The current results that consider periodontitis as a risk factor during birth may be conditioned by the periodontal indexes used and the measures established.

#### 84. PULP REVASCULARIZATION: A CHALLENGE FOR PEDIATRIC DENTISTS

**González B, Ríos M, Mourelle MR, Saavedra G, Barbería E**

*Universidad Complutense de Madrid*

*Introduction:* When dentists come across a young permanent tooth with pulp necrosis, they aim to keep the tooth in the mouth for as long as possible, free of infection and without any associated pathology. This has been achieved since the 60's with calcium hydroxide induced apexification, and in the 90's with the use of mineral trioxide aggregate (MTA) which leads to the formation of an apical plug.

Given that the ultimate aim when treating young permanent teeth is of maintaining the vitality of the pulp, pulp revascularization appears to be an alternative tech-

nique. It is based on the anatomic and histological factors of immature teeth which, on having a large pulp and an open apex, have a good blood supply and a possible healing potential. This new protocol induces a hemorrhage in order to fill the root canal with a blood clot, which will then serve as a guide and allow the generation of vital tissue in the root canal and continued root formation.

*Objectives:* This study aims to gather together the more important aspects of the more traditional procedures, such as the latest advances in revascularization protocols.

*Method:* A search was carried out using books in the Dental Faculty of the Universidad Complutense de Madrid in the area of endodontics and pediatric dentistry, and chapters were chosen that referred to pulp treatment in the permanent young dentition.

Once the basic information had been obtained, articles from the databases of PubMed and Medline were used to complement this. The keywords used were: pulp revascularization, regeneration, endodontics y antibiotics. The years revised were from 1992 to 2011.

*Conclusions:* Revascularization is an alternative treatment that improves the prognosis of immature necrotic teeth, as it allows greater root development reducing the risk of long term fractures.

It is considered fundamental for achieving the revascularization and disinfection of root canals, as well as for maintaining the vitality of stem cells of pulp and periapical tissue.

More investigations are required in this field not only because revascularization continues being unknown territory in many aspects, but because we lack well-documented long-term clinical experience.

#### 85. SLEEP APNEA IN PEDIATRIC PATIENTS

**Gómez A, Briceño S, Diéguez M**

*Universidad Europea de Madrid*

*Introduction:* Sleep apnea is a disorder during which breathing stops for short periods of time during sleep. This periodic hypoxia can lead to severe complications that are cardiovascular as well as nervous, which has a negative effect on learning and memory function. The pauses can last seconds or minutes, and breathing returns to normal with heavy snoring or a noise that is similar to choking.

Diagnosis and treatment are possible today with the clinical studies carried out by the National Institute for Heart, Lungs and Blood. Dentistry also represents a fundamental role in this diagnosis, as well as in the prognosis and treatment of nocturnal breathing problems.

*Objectives:*

1. To establish a protocol for the diagnosis and treatment of pediatric patients with sleep apnea.
2. To discover the risk factors in order to try to reduce these and improve the prognosis of the apnea.
3. To achieve an improvement in quality of life and expectancy.

*Material and methods:* The information published over the last 10 years comprising of scientific articles and journals on sleep apnea was reviewed, and the disorder analyzed and compared to medical histories obtained of pediatric patients attending the clinic of the Masters degree in Pediatric Dentistry of the UEM.

*Conclusions:* Sleep apnea is one of the most common disorders in our society with a prevalence in men of 4 to 8% and in women of 2 to 4%. It is very difficult to diagnose and it can pass unnoticed. However, the severe disturbances that may arise, make it necessary to consider carrying out an exhaustive study among the pediatric population, in order to reduce possible pathologies in the future and to improve life expectancy and quality in the pediatric population.

## **86. NEW STRATEGIES FOR MAINTAINING A SPACE: ESSIX PLATES**

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*Introduction:* The premature loss of primary teeth can lead to a reduction in the dental arch. The management of these spaces is an important responsibility for pediatric dentists as otherwise malocclusion can arise or existing malocclusion can worsen. In addition, the loss of multiple primary teeth can favor the appearance of bad habits or diminish the self-esteem of a patient. In

order to prevent these problems a wide range of space maintainers have been proposed.

*Objectives:* The low survival rate of traditional fixed retainers and the high rate of caries and decalcification related to their use, led us to provide the patients attending the department of pediatric dentistry of the dental clinic of the Universidad CEU-UCH, with a new type of retainer made with thermoplastic material. The aim of our presentation is to introduce a method for maintaining spaces by using aesthetic removable aligners in patients in the mixed dentition.

*Materials and methods:* After a review of the literature that analyzed articles published from 2000 until 2012, and after studying different strategies for maintaining a space, together with success ratios and the advantages and disadvantages, we designed an alternative. Cases are presented of removable space maintainers made with Essix type A+ plates with a thickness of 1mm and 1.5mm designed according to the methods described by Sheridan and cols in 2004. The technique permits making various types of maintainers, from the simplest to extremely distal ones, and even maintainers that serve as a support for prosthetic elements.

*Conclusions:* Space maintainers that consist of thermoplastic plates are a practical, economic and aesthetic alternative to traditional space maintainers. These retainers, given their reduced size, do not interfere with speech and they allow suitable hygiene. These cases are part of a line of investigation that is aimed at verifying the efficiency of maintainers using thermoplastic material and their cost-effective relationship.