

FEATURES SECTION

Relevant research from non-orthodontic journals

This occasional section is designed to draw the attention of readers to papers that have been published in non-orthodontic journals, but which may be of interest. The abstracts have been selected and edited by Rachel Bradford and Professor Nigel Hunt.

Obstructive sleep apnoea

Didgeridoo playing as an alternative treatment for obstructive sleep apnoea syndrome: randomised controlled trial. *BMJ* 2006; 332: 266–270

Puhan MA, Suarez A, Lo Cascio C, Zahn A, Heitz M, Braendli O

Objective: To assess the effects of didgeridoo playing on daytime sleepiness and other outcomes related to sleep by reducing collapsibility of the upper airways in patients with moderate obstructive sleep apnoea (OSA) syndrome and snoring.

Background: A didgeridoo instructor reported that he and some of his students experienced reduced daytime sleepiness and snoring after playing the didgeridoo for several months. It was thought it might be due to training of the muscles of the upper airways, which control airway dilation and wall stiffening.

Study design: A randomized controlled trial.

Setting: A private practice of a didgeridoo instructor and a single centre for sleep medicine in Switzerland.

Material and method: 25 patients aged >18 years with an apnoea-hypopnoea index between 15 and 30 and who complained about snoring, participated in the study. Didgeridoo lessons and daily practice at home with standardized instruments was undertaken for four months. Participants in the control group remained on the waiting list for lessons.

Main outcome measure: Daytime sleepiness (Epworth scale from 0 (no daytime sleepiness) to 24), sleep quality (Pittsburgh quality of sleep index from 0 (excellent sleep quality) to 21), partner rating of sleep disturbance (visual analogue scale from 0 (not disturbed) to 10), apnoea-hypopnoea index, and health related quality of life (SF-36).

Results: Participants in the didgeridoo group practised an average of 5.9 days a week (SD 0.86) for 25.3 minutes

(SD 3.4). Compared with the control group in the didgeridoo group daytime sleepiness (difference -3.0 , 95% confidence interval -5.7 to -0.3 , $P=0.03$) and apnoea-hypopnoea index (difference -6.2 , -12.3 to -0.1 , $P=0.05$) improved significantly and partners reported less sleep disturbance (difference -2.8 , -4.7 to -0.9 , $P<0.01$). There was no effect on the quality of sleep (difference -0.7 , -2.1 to 0.6 , $P=0.27$). The combined analysis of sleep related outcomes showed a moderate to large effect of didgeridoo playing (difference between summary z scores -0.78 SD units, -1.27 to -0.28 , $P<0.01$). Changes in health-related quality of life did not differ between groups.

Conclusion: Regular didgeridoo playing improved daytime sleepiness in patients with moderate snoring and OSA and reduced sleep disturbance in their partners.

Comment: This is a very small study and only takes into account non-obese participants with moderate OSA. The participants in the didgeridoo group were highly motivated and it would be surprising indeed if there was not a strong placebo effect. The data in this trial is unconvincing and it is doubtful that the didgeridoo will emerge as a useful therapy, especially in those with obesity and more severe disease! There is also the issue of whether the treatment modality is widely accessible!

Hypodontia

A radiographic study of tooth development in hypodontia. *Arch Oral Biol* 2006; 51: 129–123

Uslenghi S, Liversidge HM, Wong FSL

Objective: To investigate the radiographic development of permanent teeth in a group of children (66 females and 69 males, aged 3.08–15.02 years) affected by agenesis of one or more permanent teeth (excluding third molars), to determine whether the severity of the hypodontia had an effect on dental development and whether the dental development of the teeth adjacent to

the agenesia space was affected, compared to a matched group.

Method: Tooth formation of all developing permanent teeth was assessed using Haavikko's method (1970) from dental panoramic tomographs. The difference between dental and chronological age was tested using a paired *t*-test. The correlation between the difference of dental and chronological age and severity of hypodontia was investigated using Spearman correlation test. In addition, radiographs of all children with only one single missing tooth in one quadrant and no more than two agenesia in total ($N=59$), were analyzed using the non-parametric Wilcoxon sign test, in order to investigate if the development of the teeth adjacent to the site of the agenesia was effected.

Results: Tooth formation in children with hypodontia was significantly delayed compared to the matched group ($P<0.001$). The mean difference was 1.51 years (SD 1.37 years). The severity of the hypodontia affected the magnitude of the delay ($P<0.01$). The teeth adjacent to the site of the agenesia were significantly delayed compared to the corresponding teeth in the matched group ($P<0.01$).

Conclusion: A quantifiable and significant delay of 1.5 (SD 1.37) years in dental development was found in the group of children affected by hypodontia compared to the control group. A significant and similar delay in dental development ($P<0.01$) was observed in both the mesial and distal tooth adjacent to the site of agenesia, compared to the corresponding teeth in the control group. A significant association was found between severity of the hypodontia and magnitude of delay in the sample examined ($P<0.01$).

Comment: These results confirm that the development of permanent teeth in children with hypodontia is different when compared with a matched group.

Paediatric oral and maxillofacial pathology

An analysis of oral and maxillofacial pathology found in children over a 30-year period. *Int J Paediatr Dent* 2006; 16: 19–30

Jones AV, Franklin CD

Objective: The vast majority of oral diseases are confined to oral tissues, but numerous underlying systemic conditions may present with signs and symptoms within the oral cavity. Since the epidemiology of diseases is variable between regions, the authors

carried out Europe's first paediatric-based survey of oral and maxillofacial pathology specimens submitted for diagnosis.

Method: All entries for specimens from children between the ages of 0 and 16 years during the 30-year period from 1973 to 2002 were retrieved and compiled into 12 diagnostic categories.

Results: During the study period, 4406 (8.2%) specimens came from children between the ages of 0 and 16 years, with a male to female ratio of 1.01. The diagnostic category with the largest number of specimens was tooth pathology (22.1%), followed by salivary gland disease (19.1%) and mucosal pathology (12.1%). In all, there were 114 benign tumours of nonodontogenic origin, 43 odontogenic tumours and 31 malignant tumours. The most frequently diagnosed lesions were mucous extravasation cysts, which accounted for over 16% of cases. Periapical pathology in the form of a radicular cyst, residual cyst or chronic periapical granuloma formed almost 13% of all cases.

Conclusions: This survey shows that, while nearly 10% of specimens submitted to the authors' laboratory are from children under 16 years of age, the majority of lesions are of a benign nature, requiring minimal intervention; less than 1% of cases comprise malignant lesions. Odontogenic tumours are relatively rare in this age group; however, certain lesions such as adenomatoid odontogenic tumour and ameloblastic fibroma occur predominantly in children and, therefore, remain an important diagnostic consideration.

Comment: The results do not represent the actual prevalence of oral disease in the general population, but simply the relative frequency of histologically diagnosed lesions over a 30-year period. This survey covers a wide spectrum of disease that should be of interest to all clinicians treating children.

Replantation of avulsed teeth

Replantation of 45 avulsed permanent teeth: a 1-year follow-up study. *Dent Traumatol* 2005; 21: 289–96

Chappuis V, Von Arx T

Objective: To evaluate the treatment outcome of 45 avulsed and replanted permanent incisors after a 1-year follow-up period. In particular, the following aspects were to be assessed with regard to pulpal and periodontal healing: time and medium of extraoral storage,

endodontic treatment, use of tetracycline, and application of enamel matrix derivative (EMD).

Method: Thirty-four patients with 45 avulsed and replanted permanent teeth were followed for 1 year. All teeth were soaked in tetracycline before replantation. In addition, EMD was used in teeth with dry storage times exceeding 30 minutes. Splinting was carried out with a non-rigid titanium splint and was limited to 7–10 days. Within that period, root canal treatment was begun in all teeth with a closed apex, whereas teeth with an open apex and ideal post-traumatic storage were not instrumented. All patients were given tetracycline systematically for 10 days.

Results: The survival rate of replanted avulsed permanent teeth was 95.6% at the 1-year follow-up. In 82.2%, root canal treatment was performed. Pulp survival was never observed, but three teeth had pulp canal obliteration. Normal periodontal healing was observed in 57.7% of teeth; 42.3% of teeth showed external root resorption (28.9% replacement resorption, 6.7% infection-related resorption, 6.7% surface resorption). The occurrence of replacement resorption correlated with the period of extraoral dry storage.

Conclusions: Compared with other clinical studies on avulsed and replanted teeth, the present study reports a higher percentage of periodontal healing. The favorable treatment outcome may be associated with a strict protocol to enforce endodontic treatment, the use of topical and systemic tetracycline, and the relatively high number of ideally stored teeth following avulsion. In contrast, the present study has a follow-up period limited to 1 year.

Comment: Within the limits of the present study, no beneficial effect of using EMD was observed to avoid replacement resorption.

Orthognathic surgery

Short- and long-term skeletal relapse after mandibular advancement surgery. *Int J Oral Maxillofac Surg* 2006; 35: 36–42

Eggensperger N, Smolka K, Luder J, Iizuka T

Objective: The purpose of this study was to cephalometrically determine the extent of short- and long-term skeletal relapse after mandibular advancement surgery and to analyze its contributing factors at different postoperative stages. Data were also analyzed in detail, assessing the effects of the high-angle and low-angle Class II facial patterns.

Method: 32 consecutive patients were treated for skeletal Class II malocclusion during the period between 1986 and 1989. They all had combined orthodontic and surgical treatment with BSSO and rigid fixation excluding other surgery. Of these, 15 patients (47%) were available for a long-term cephalography in 2000. The measurement was performed based on the serial cephalograms taken preoperatively; 1 week, 6 months and 14 months postoperatively; and at the final evaluation after an average of 12 years.

Results: Mean mandibular advancement was 4.1 mm at B-point and 4.9 mm at pogonion. Representing surgical mandibular ramus displacement, gonion moved downwards 2 mm immediately after surgery. During the short-term postoperative period, mandibular corpus length decreased only 0.5 mm, indicating that there was no osteotomy slippage. After the first year of observation, skeletal relapse was 1.3 mm at B-point and pogonion. The relapse continued, reaching a total of 2.3 mm after 12 years, corresponding to 50% of the mandibular advancement. Mandibular ramus length continuously decreased 1 mm during the same observation period, indicating progressive condylar resorption.

Conclusions: No significant relationship between the amount of initial surgical advancement and skeletal relapse was found. Preoperative high mandibulo-nasal plane (ML-NL) angle appears to be associated with long-term skeletal relapse.

Comment: Most previously reported studies describe skeletal relapse after only 1 to 2 years postoperatively. To date, the longest follow-up study reported in the literature is 6 years. This paper sets out to answer whether skeletal relapse continues over a long-term period.

Cleft maxillary osteotomy versus distraction osteogenesis

A meta-analysis of cleft maxillary osteotomy and distraction osteogenesis. *Int J Oral Maxillofac Surg* 2006; 35: 14–24

Cheung LK, Chua HDP

Objective: To provide a body of evidence-based data to assist surgeons to make an informed choice between distraction osteogenesis or conventional osteotomy for cleft lip and palate (CLP) patients, through a comprehensive meta-analysis of the available literature.

Method: A PUBMED search of the National Library of Medicine from 1966 to December 2003 was conducted.

Keywords used in the search were 'cleft', 'distraction', 'maxilla', 'maxillary', 'advancement', 'osteotomy', and 'orthognathic surgery'.

Results: Of the 98 articles identified in the search, 72 were related to cleft maxillary osteotomy and 26 to cleft maxillary distraction. This study found that distraction osteogenesis tends to be preferred to conventional osteotomy for younger CLP patients with more severe deformities. In such cases it was feasible to use distraction to correct moderate to large movement of the maxilla by either complete or incomplete Le Fort I osteotomy, and a concurrent mandibular osteotomy was less frequently required. Intra-operative and post-operative complications were uncommon with either technique, and some of the traditional ischemic complications related to conventional osteotomy were replaced by infection of the oral mucosa due to the prolonged

retention of the distractors. There is still no conclusive data on any differences in surgical relapse, velopharyngeal function and speech between the two techniques.

Conclusion: Both distraction osteogenesis and conventional osteotomy can deliver a marked improvement in facial aesthetics.

Comment: We should be cautious in drawing sweeping conclusions from comparison of the qualitative data gathered for this study. The benefits of distraction osteogenesis in this respect will only be firmly established by a scientifically-conducted randomized controlled study. For a more detailed comparizon of the effect of the two techniques on facial aesthetics, research should be directed towards the soft and hard tissue ratio changes in 3D imaging instead of focusing on the traditional radiographic and photographic comparisons.