

FEATURES SECTION

Relevant research from non-orthodontic journals

This 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 Catherine O'Brien and Professor Nigel Hunt.

Impacted canines

Short- and long-term periodontal evaluation of impacted canines treated with a closed surgical-orthodontic approach. *J Clin Periodontol* 2007; 34: 232–42

Crescini A, Nieri M, Buti J, Baccetti T, Mauro S, Pini Prato GP

Objective: To evaluate and compare the periodontal status of unilateral impacted maxillary canines treated by a combined surgical-orthodontic technique with that of normally erupted contralateral canines.

Methodology: The sample consisted of 125 consecutive patients presenting with one impacted maxillary canine (test group) and the contralateral canine normally erupted (control group). The age range was 12.8–52.0 years. All cases were treated with a 'closed' flap approach followed by orthodontic traction directed towards the centre of the alveolar ridge. Patients were evaluated periodontally at the end of treatment, recording pocket depth (PD), keratinized tissue width (KT) and gingival recession. Fifty-eight patients were followed up for a mean of 3.4 ± 0.5 years. Multilevel models were created.

Results: At the end of orthodontic treatment, PD and KT of the 125 impacted canines were slightly, but statistically significantly, higher than controls. Only one treated canine showed a recession (1 mm). At follow-up (58 patients), this difference decreased and the two groups were not significantly different.

Conclusions: The combined technique permitted the traction of the impacted canines to the centre of the crest, thus simulating a physiological eruption pattern. Correct alignment and good periodontal status were obtained.

Comment: The technique described was a closed technique with minimal bone removal for unilateral buccally or palatally impacted canines followed by orthodontic traction. After a lengthy follow-up of a

mean of 3.4 years, there was no difference in the periodontal condition of the impacted versus the contralateral spontaneously erupted canine.

Orthodontic tooth movement

Cytokine profiles in crevicular fluid during orthodontic tooth movement of short and long durations. *J Periodontol* 2007; 78: 453–58

Ren Y, Hazemeijer H, de Haan B, Qu N, de Vos P

Objective: Orthodontic tooth movement induces a distortion of the extracellular matrix of the periodontium, resulting in alterations in cytoskeletal configuration. Cytokines are known to facilitate this process by inducing cellular proliferation, differentiation and stimulation of periodontal remodelling. The objective was to measure a panel of proinflammation cytokines (PICs) in gingival crevicular fluid (GCF) samples during tooth movement of short and long duration.

Method: Twelve patients (11–27 years) participated in the study: six patients each for tooth movement of short and long duration. Gingival crevicular fluid sampling was done at different times, ranging from 24 hours to four months after force application. The profiles of PICs were analysed with a multiplex technique.

Results: Proinflammation cytokines were elevated significantly in the early stages of tooth movement but at different time points. Interleukin (IL)-1 β and -6 and tumour necrosis factor-alpha (TNF- α) reached significant levels at 24 hours; IL-8 reached a significant elevation at one month. During the linear stage of tooth movement, all cytokines were diminished to their baseline levels. The results demonstrated that IL-1 β , -6, and -8 and TNF- α play a significant role during the early stage of tooth movement but not the linear stage.

Conclusions: Once the microenvironment of periodontal tissue is activated by an orthodontic force, several key PICs are produced to trigger a cascade of cellular events.

The periodontal system stabilizes a new physiological homeostasis as indicated by the downregulation of the early-phase PICs.

Comment: It is known that excessive or continuous amounts of cytokines in periodontal tissues are responsible for periodontal breakdown and periodontal remodelling during tooth movement. This study demonstrates the profiles of four PICs in tooth movement of short and long duration. These PICs – IL-1 β , -6, and -8 and TNF- α – play a significant role in the early stage of tooth movement, but not in the linear phase.

Implants

Success rate of mini- and micro-implants used for orthodontic anchorage: a prospective clinical study. *Clin Oral Implants Res* 2007; 18: 263–67

Wiechmann D, Meyer U, Büchter A

Objective: Although mini-implants have become a useful alternative to conventional anchorage reinforcement systems in orthodontics, less is known about their clinical effectiveness. The aim of this prospective clinical study was to evaluate the success rate of mini-implants used for orthodontic anchorage.

Material and methods: A total of 133 mini-implants (79 Abso Anchor, 54 Dual Top implants) placed in 49 patients to support orthodontic tooth movements were examined in the study. The majority of the implants were placed in the maxilla (82), followed by the vestibular (42) and lingual (9) aspect of the mandible.

Results: An overall cumulative survival rate of 86.8% (102/133) was found by Kaplan–Meier analysis. The failure rate between Dual Top implants (13%) and Abso Anchor implants (30.4%) differed significantly ($P=0.0196$; log-rank test). The cumulative failure rate of implants was found to be significantly higher when implants were placed in the lingual aspect of the mandible compared with the other localizations ($P=0.0011$; log-rank test). Clinical evaluation revealed successful dental movements when implants remained stable during the orthodontic therapy.

Conclusions: The present results confirm the effectiveness of orthodontic mini-implants used as anchorage elements. Failure was most likely when implants were placed in the lingual aspect of the mandible.

Comment: This was a prospective study looking at the success of mini-implants in orthodontics. The terms mini- and micro-implants were used in the title which was somewhat misleading as both these terms describe

screws of the same dimension without differentiation. The methodology did not mention where the treatment was carried out and also whether the mini-implants were placed by one or more operators. The study did show that success of mini-implants was dependent on placement in keratinized gingiva. A decrease in diameter was associated with an increased failure rate. The implants could be immediately loaded by continuous forces.

Consent

The accompanying adult: authority to give consent in the UK. *Int J Paediatr Dent* 2007; 17: 200–4

Lata Lal SM, Parekh S, Mason C, Roberts G

Objective: To ascertain if accompanying persons of children attending the Department of Paediatric Dentistry at the Eastman Dental Hospital, London were empowered to give consent for the child's dental treatment.

Method: A total of 250 accompanying persons of children attending were selected, over a six-month period. A questionnaire was used to establish whether the accompanying person(s) were authorized to give consent.

Result: The study showed that 12% of accompanying persons had no legal authority to give consent for the child's dental treatment.

Conclusion: Clinicians need to be aware of the status of persons accompanying children to ensure valid consent is obtained.

Comment: It is recommended that the status of accompanying persons be checked to avoid invalid consent. Mothers and married parents have parental responsibility, but unmarried fathers do not, unless they have a court order or formal agreement with the mother. Step-parents, foster carers and relatives do not automatically acquire parental responsibility. This study also advocated the benefits of including the child in decision making regarding their care.

Cleft lip and palate

Early surgical outcomes in 5-year-old patients with repaired unilateral cleft lip and palate. *Cleft Palate Craniofac J* 2007; 44: 235–38

Clark SA, Atack NE, Ewings P, Hathorn IS, Mercer NS

Objective: To assess the surgical outcome of 5-year-old subjects with repaired unilateral cleft lip and palate who had been operated on by a single surgeon.

Design: Retrospective consecutive outcome study.

Setting: The cleft lip and palate centre at Frenchay Hospital, North Bristol NHS Trust, UK.

Participants: All patients born with unilateral cleft lip and palate between May 1992 and April 1998 were identified and their study models were located.

Main outcome measures: The reasons for failing to obtain study models were recorded. The 'test' study models were combined randomly with a 'gold standard' set of study models to give a group of 53 for assessment purposes. These study models were assessed twice by two examiners independently using the 5-Year-Olds' Index. The weighted kappa (κ) statistic and components of variance were used to establish the levels of agreement within and between examiners, as well as between the gold standard and the examiners.

Results: Thirty sets of study models out of a possible 43 were located. The most common reason for not obtaining records was poor cooperation. More than 50% of study models were assessed as being good outcomes (Index groups 1 and 2), whereas fewer than 20% of the records were evaluated as being poor outcomes (Index groups 4 and 5). There was good inter- and intra-examiner agreement and agreement with the gold standard values.

Conclusion: Study model collection in this age group can be difficult due to patient cooperation.

Comment: It is important to maintain an up-to-date record collection so that outcomes can be assessed. More than 50% of models had good outcomes supporting the view that centralization and standardization of care for these children can improve outcome results.

Prevention of orofacial clefts: does pregnancy planning have a role? *Cleft Palate Craniofac J* 2007; 44: 244–50
Mossey PA, Davies JA, Little J

Objective: To investigate the association between pregnancy planning and orofacial clefts in the United Kingdom.

Design: Case-control study.

Setting: Scotland and the Manchester and Merseyside regions of England.

Participants: One hundred and ninety-one children born with nonsyndromic orofacial cleft, 1997–2000, and 247 controls.

Main outcome measure: Cleft lip with and without cleft palate, and cleft palate.

Results: There was an inverse association between planning for pregnancy and orofacial cleft in the offspring (odds ratio [OR]=0.51, 95% confidence interval [CI]=0.33–0.79). An unplanned pregnancy together with smoking in the first trimester of pregnancy resulted in almost treble the risk of a child with an orofacial cleft when compared with those who planned their pregnancy and did not smoke (OR=2.92, CI=1.50–5.65).

Conclusions: Planned pregnancies were associated with a lower risk of orofacial clefts. Isolation of the elements of pregnancy planning implicated in these results is difficult. Current pre-conception advice needs to reach a wider audience; however, for maximum impact, efforts are needed to reduce the numbers of unplanned pregnancies.

Comment: It would seem sensible to take steps to ensure that all mothers-to-be are aware of current pre-conception advice and are given appropriate help in implementing it.

Orthognathic surgery

Facial altered sensation and sensory impairment after orthognathic surgery. *Int J Oral Maxillofac Surg* 2007; 36: 577–82

Essick GK, Phillips C, Turvey TA, Tucker M

Objective: To determine whether impairment of sensory functions after trigeminal nerve injury differs in severity among patients who report qualitatively different altered sensations.

Method: Data were obtained from 184 patients. Before and at one, three and six months after orthognathic surgery, patients were grouped as having no altered sensation, negative sensations only (hypoaesthetic), mixed sensations (negative + active), or active sensations only (paraesthetic or dysaesthetic). Bias-free estimates of contact detection and two-point discrimination were obtained to assess, via ANOVA, whether patients in the four groups exhibited different levels of sensory impairment.

Results: Impairment in contact detection and two-point discrimination was found to differ significantly among the groups at six months but not at one month. At six months, patients who reported negative sensations only exhibited the greatest impairment, on average, in contact detection; in contrast, patients who reported mixed sensations exhibited the greatest impairment in two-point discrimination. The least residual impairment at six months was observed in patients who reported no altered sensation.

Conclusion: It is recommended that clinical judgments regarding nerve injury-associated sensory dysfunction should not be based on threshold testing results without consideration of patients' subjective reports of altered sensation.

Comment: Post-surgery, altered sensation of the face and mouth is most commonly assessed by questioning the patient. Less frequently, quantitative

sensory testing methods are used. This study confirms the usefulness of both patients' reports and of threshold measures of sensory function in the evaluating nerve injury. Impairment in contact detection and two-point discrimination cannot be attributed to altered response biases associated with altered skin sensation, but rather to differences in patients' abilities to detect and discriminate tactile stimuli.