

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 Lucy Davenport-Jones and Professor Nigel Hunt.

Digital imaging

Digital images as an alternative to orthodontic casts in assessing malocclusion and orthodontic treatment need. *Acta Odontol Scand* 2007; 65(6): 362–68

Mok CW, Zhou L, McGrath C, Hägg U, Bendeus M

Objective: To investigate the potential use of two-dimensional digital images as an alternative to orthodontic casts in the assessment of malocclusion and orthodontic treatment need.

Materials and methods: Assessment of malocclusion (Angle's classification of molars, overjet, and overbite) and orthodontic treatment need (Index of Orthodontic Treatment Need (IOTN); Dental Health Component (DHC); Aesthetic Component (AC)) was conducted on 313 study casts and their images by two trained and calibrated examiners. Agreement of orthodontic treatment need and Angle's molar classification was assessed employing Kappa statistics (κ). Agreement of overjet and overbite (measured in mm) was assessed in comparison and correlation analyses. Inter- and intra-examiner reliability of assessment was investigated.

Results: There was substantial agreement of the molar relationship classifications ($\kappa > 0.70$), orthodontic treatment need as assessed by IOTN-DHC ($\kappa = 0.79$) and IOTN-AC ($\kappa = 0.56$) between measurements obtained from orthodontic casts and their images. There was also substantial agreement of measurements of overjet and overbite as obtained from orthodontic casts and their images. The standardized directional differences of overjet and overbite were ≤ 0.2 . The intra-class correlation coefficients of assessments of overjet and overbite obtained from orthodontic casts and their images were > 0.90 . Inter- and intra-examiner reliability for the assessment of malocclusion and orthodontic treatment need was acceptable.

Conclusions: Two-dimensional digital images can be used as an alternative to casts in assessment of malocclusion and orthodontic treatment need.

Comment: This timely article highlights the disadvantages of taking and storing study models and the expense of digitized study models. Unfortunately the photographs taken in this study were taken of study models not patients; subsequently the standardized approach to taking photos is not easily applied in the clinical setting. Some concerns were raised in the discussion relating to the reliability of overjet assessment from two-dimensional images. Further research with clinical photographs is necessary to determine if two-dimensional images are a real alternative to study models.

Implants

Orthodontic space closure versus implant placement in subjects with missing teeth. *J Oral Rehabil* 2008; 35(S1): 64–71

Thilander, B

Aim: A systematic review of alternative orthodontic space closure and implant placement in young adults with missing teeth.

Method: A literary search using the MEDLINE (PubMed) database from 1990 to 2007 revealed a total of 146 articles. Only studies in English or other languages with an English abstract were accepted, reducing the number to 91 articles. Among them, only one prospective and three retrospective articles, two review papers and five case reports with discussion were found. The others presented one or two cases, or focused on treatment planning of missing teeth in general and therefore were excluded. A manual search of bibliographies in relevant journals gave no additional information. Thus, only 11 relevant articles were accepted.

Results: This systematic review clearly showed that both alternatives (space closure or implant placement) present advantages as well as disadvantages. Knowledge

about tissue reaction of orthodontic space closure and dento-facial development (including continuous changes of the dentition and its supporting tissues) are significant factors in the choice of treatment.

Conclusions: More research on a basic level together with clinical follow-up studies of large samples is required.

Comment: This thorough systematic review discusses negative observations for long-term aesthetics of implant retained prostheses, such as infra-position of the implant-supported crown, discoloured labial gingiva, gingival retraction and 'root' exposure. The paper usefully reviews previous work in this area and highlights the complex nature of growth in the craniofacial complex. It also calls for more clinical follow-up studies (5–10 years or longer) in patients with differing craniofacial morphology.

Relapse

Evaluation of orthodontic treatment, retention and relapse in a 5-year follow-up: a comparison of treatment outcome between a specialist and a post-graduate clinic. *Swed Dent J* 2007; 31(3): 121–27

Tofeldt LN, Johnsson AC, Kjellberg H

Aim: The aim of this study was to evaluate and compare orthodontic treatment provided between a specialist clinic and a post-graduate clinic.

Materials and methods: Eighty-one individuals treated in the Post-graduate Clinic at the Department of Orthodontics, University of Göteborg, and 84 individuals treated at the Orthodontic Specialist Clinic in Vänersborg were examined up to five years following the completion of treatment. The Peer Assessment Rating (PAR) index was used on pre-, post-treatment and 5-year follow-up study casts.

Results: The percentage reduction in weighted PAR (WPAR) scores after treatment and at the 5-year follow up did not differ significantly between the clinics. There were significant higher pre-, post-treatment and 5-year follow-up PAR and WPAR scores in patients from the Specialist Clinic as compared with patients from the Post-graduate Clinic. In the whole sample 97.6% of the patients were improved or greatly improved immediately after treatment and 95.8% were still improved or greatly improved five years following treatment. Sixty-seven per cent of the patients still had retainers in one or both arches at the 5-year follow-up.

Conclusions: The WPAR scores are one factor that indicates the high quality of the treatment process in both clinics. The higher post-treatment PAR scores in the Specialist Clinic may be because a larger number of patients were treated only in one jaw at this clinic.

Comment: This 5-year follow-up study provides an insight into the types of cases that are treated in a specialist clinic versus a post-graduate clinic, with the former having cases with higher PAR scores throughout treatment and review. Unusually, many of the cases in the Specialist Clinic were treated in one arch only, which prevents accurate comparison between the two treatment clinics and further extrapolation of the results. A comparative study in the UK would be interesting in the current political climate.

Decalcification

Effect of a dental cream containing amorphous cream phosphate complexes on white spot lesion regression assessed by laser fluorescence. *Oral Health Prev Dent* 2007; 5(3): 229–33

Andersson A, Skold-larsson K, Hellgren A, Petersson LG, Twetman S

Aims: To investigate and compare the effects of a dental cream containing complexes of casein phosphoprotein-amorphous calcium phosphate (CPP-ACP) and fluoride mouthwashes on the regression of white spot lesions (WSL).

Materials and methods: The study group consisted of 26 healthy adolescents (mean age 14.6 years) exhibiting 60 teeth with 152 visible WSL sites on incisors and canines immediately after debonding of fixed orthodontic appliances. After bracket removal, professional tooth cleaning and drying, a visual scoring (0–4) and laser fluorescence (LF) readings were carried out. The patients were randomly assigned to two different treatment protocols with the aim of remineralizing the lesions: (A) daily topical applications of a dental cream containing CPP-ACP (Topacal) for three months followed by a three-month period of daily toothbrushing with fluoridated dentifrice, or (B) daily 0.05% sodium fluoride mouthwash combined with fluoridated dentifrice for six months. The registrations were repeated after 1, 3, 6 and 12 months and follow-up data were compared with baseline with aid of chi-square and paired *t*-tests.

Results: A significant improvement of the clinical WSL-scores was found over time in both groups, but there was a statistically significant difference ($P < 0.01$)

concerning the number of sites that totally disappeared after 12 months in favour of the CPP-ACP regime; 63% compared with 25% respectively. The clinical registrations were mirrored by a statistically significant decrease ($P<0.05$) in the LF readings at the 6- and 12-month follow-ups compared with baseline. No significant differences were displayed between the groups.

Conclusions: Clinical scoring and LF assessment suggested that both regimens could promote regression of WSL after debonding of fixed orthodontic appliances. The visual evaluation suggested an aesthetically more favourable outcome of the amorphous calcium phosphate treatments.

Comment: This piece of research provides further evidence that CPP-ACP is a useful tool in the treatment of white spot lesions. Interestingly, CPP-ACP was used in isolation for group A for the first three months, without fluoride toothpaste. Long-term follow-up with further comparison of the two systems would be of interest.

Video imaging

Subjective evaluation of the accuracy of video imaging prediction following orthognathic surgery in Chinese patients. *J Oral Maxillofac Surg* 2008; 66(2): 291–96
Chew MT, Koh CH, Sandham A, Wong HB

Aims: The aims of this retrospective study were to assess the subjective accuracy of predictions generated by a computer imaging software in Chinese patients who had undergone orthognathic surgery and to determine the influence of initial dysgnathia and complexity of the surgical procedure on prediction accuracy.

Materials and methods: The sample consisted of 40 Chinese patients who had completed treatment involving orthodontics and orthognathic surgery. All the patients had lateral cephalometric radiographs and profile photographs taken within three months before surgery and at least six months after surgery. The computer-generated predicted images and the actual post-treatment images were displayed simultaneously to a panel of orthodontists, oral-maxillofacial surgeons and laypersons to allow side-by-side comparison. The panel was asked to determine which image was more aesthetic and to rate the likeness between the actual and predicted images using a 10 cm visual analogue scale.

Results: The results showed that the actual image was judged to be more aesthetic in 82% of the cases, with the orthodontists more likely to select the actual profile

compared to laypersons ($P=0.005$). Orthodontists and surgeons rated the likeness of the images similarly while laypersons rated the likeness significantly lower than the clinicians ($P=0.012$ and $P=0.015$, respectively). Skeletal III cases were judged to be less accurately predicted than skeletal II cases by laypersons ($P=0.006$) and orthodontists ($P=0.036$). Cases treated by single-jaw osteotomy were given better ratings compared to cases with bimaxillary osteotomy by all panel groups but the differences did not reach a significant level.

Conclusions: Skeletal III cases managed by bimaxillary osteotomy were least accurately predicted by the computer program. As there exists a possibility that the predicted image may be judged to be more aesthetic than the actual image, clinicians must make extra effort to manage patient expectations when using computer simulations for patient education.

Comment: As this article states, profile prediction is an essential part of orthognathic planning and increasingly computer programs are taking over from tracing techniques. Reassuringly, the actual image was judged to be more aesthetic in 82% of cases in this research. This article raises important concerns regarding unrealistic expectations with the use of optimistic predictions and their accuracy. Some overestimation of the horizontal position of the lips was found with this system, which may have provided more aesthetic images. The authors recommend the use of disclaimers and waiver forms to safeguard the profession.

Canines

Combined surgical and orthodontic approach to reproduce the physiologic eruption pattern in impacted canines: report of 25 patients. *Int J Periodontics Restorative Dent* 2007; 27(6): 529–37

Crescini A, Nieri M, Rotundo R, Baccetti T, Cortellini P, Prato GP

Aims: The purpose of this study was to evaluate the periodontal variables of impacted maxillary canines that were treated with a combined surgical and orthodontic approach aimed at reproducing the physiologic eruption pattern of canines.

Materials and methods: Twenty-five patients who presented with unilateral impacted maxillary canines were consecutively enrolled (age range 13.2–23.2 years). They were treated through a surgical flap and orthodontic traction directed to the centre of the crest and were evaluated periodontally at the end of treatment and again at a follow-up visit (2–5 years post-treatment).

Pocket depth, keratinized tissue width, and gingival recession were recorded.

Results: At the end of orthodontic treatment, all 25 treated canines presented with normal pocket depth (2.0 ± 0.3 mm) and a normal amount of keratinized tissue (5.0 ± 1.2 mm). No sites showed gingival recession. At the follow-up visit, both pocket depths and keratinized tissues were slightly reduced.

Conclusions: The combined technique permits traction of the impacted canines to the centre of the crest, simulating the physiologic eruption pattern and resulting in correct alignment and good periodontal status.

Comment: This study describes a technique to move ectopic canines to the centre of the alveolar crest before placing traction in an occlusal direction. It assumes that the corresponding primary canine will be present so that it can be extracted to provide a tunnel for guided eruption of its successor. Often in these cases the primary canine has been extracted in an attempt to normalize the eruption of the permanent canine. In addition both buccally and palatally ectopic canines were included in a sample size of 25. Despite this, it includes excellent clinical photographs, a detailed method of the 'tunnel' surgical procedure and provides an update on surgical procedures for ectopic canines.