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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 Gursharan Minhas and Professor Nigel Hunt.

Quality of life

The impact of fixed orthodontic appliances on daily life. *Community Dent Health* 2006; 23: 69–74
Mandall NA, Vine S, Hulland R, Worthington HV

Objective: (i) To develop a measure of the impact of fixed orthodontic appliances on daily life. (ii) To assess the impact of fixed appliances over time after initial appliance placement. (iii) To investigate factors that may influence the impact of fixed appliances (age, gender, socio-economic status).

Research design: Questionnaire.

Clinical setting: University Dental Hospital and Hope Hospital, Manchester.

Sample: Sixty-six patients, whose orthodontic appliances had just been placed. Twenty-eight patients whose orthodontic appliances were in place for at least 6 months were used for the reliability study.

Method: The impact of the Fixed Appliances Questionnaire was developed using standard qualitative methods and pre-tested on 10 patients. This resulted in a questionnaire with nine conceptual impact sub-scales: aesthetic, functional limitation, dietary, oral hygiene, maintenance, physical, social, time constraints and travel/cost. The questionnaire was piloted on 66 patients, at the first, second and third visits after their fixed appliance had been placed, to assess the impact of fixed appliances over time. Questionnaire reliability, over a 1-month time interval, was assessed on 40 patients who had been in treatment for at least 6 months.

Main outcome measure: Impact of fixed appliances on daily life.

Results: The internal reliability of the questionnaire ranged from moderate to very good (Cronbach's alpha 0.56–0.89). Test-retest reliability was stable for most subscales (intra-class correlation coefficient 0.26–0.65). The questionnaire was said to have face validity and also content validity because of the method of questionnaire development through interviewing children with fixed appliances. None of the subscales scores reduced over time except aesthetic impact ($P<0.05$), but this was probably not a clinically significant change. Age was the predominant variable to influence the impact of fixed appliances with younger children being less affected during their daily life ($P<0.05$).

Conclusions: The questionnaire developed in this study is a reliable tool for assessing the impact of fixed appliances on the daily life of children. It is unlikely that the impact of fixed appliances on daily life reduces as the patient progresses through treatment. Younger patients are probably more adaptable to treatment with fixed appliances, in terms of reduced impact on daily life, so arguably treatment should be started as early as possible. This information could also be used to educate, reassure and motivate patients at the start of treatment.

Comment: This is the first qualitative study to have examined the impact of fixed appliances on a child's daily life. This questionnaire will prove to be an invaluable tool for gathering important psychosocial data from our patients. In addition, the findings from this study provide clinical staff with useful information so that we can better inform our patients and help reduce anxiety and increase motivation for treatment.

Aesthetics

Aesthetic effect of minor changes in incisor angulation: an Internet evaluation. *J Oral Rehabil* 2006; 33: 430–35
Brunzel S, Kern M, Freitag S, Wolfart S

Aims: The aim of this study was to evaluate the aesthetic assessment of different 'tiltings' of the upper incisors with surrounding tissues.

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Method: A picture of a smiling mouth revealing the upper anterior teeth from 15 to 25 was digitally transformed producing different 'tiltings' of the incisors. These seven versions presented in a web-based survey were evaluated concerning their attractiveness. Overall, 439 judges joined the evaluation. However, 249 judges were included in analysis, because only judges with normal 'well being' and completed questionnaires were accepted. These judges consisted of 38 dentists, 26 dental and 24 other students, 45 academics and 89 non-academics, while 27 gave no data about their profession.

Results: The results [median (first; third quartile)] showed significantly that symmetrical incisors [67.5 (47.5; 85.0)] and minor changes in the angulation of one [65.0 (42.5; 80.0)] or both lateral incisors [65.0 (42.5; 80.0)], respectively, are aesthetically more attractive than the angulation of one [45.0 (27.5; 62.5)] or both central incisors [27.5 (16.3; 45.0)], or the combination of one tilted lateral and central incisor [37.5 (25.0; 60.0)].

Conclusion: These results confirm the results of a previous study where similar image versions without surrounding tissues were assessed concerning their attractiveness on printed photos.

Comment: This study provides a useful insight into the use of a web-based survey for data acquisition. The benefits of web-based recruitment include a wider range of participants, anonymity, no time limit for survey completion, no pressure to fill in the 'right' answer. The potential problems are lack of control over the number of participants and participation more than once (even without monetary gain!). The results of this study confirm the aesthetic preference for symmetry of the dentition from dental and non-dental judges.

Orthognathic surgery

Stability of skeletal Class III malocclusion after combined maxillary and mandibular procedures: titanium versus resorbable plates and screws for maxillary fixation. *J Oral Maxillofac Surg* 2006; 64: 642–51
Costa F, Robiony M, Zorzan E, Zerman N, Politi M

Purpose: The aim of this study was to evaluate skeletal stability after double jaw surgery for correction of skeletal Class III malocclusion to assess if there were any differences between resorbable plates and screws, and titanium rigid fixation of the maxilla.

Patients and methods: Twenty-two Class III patients had bilateral sagittal split osteotomy for mandibular setback stabilized with rigid internal fixation. Low level Le Fort I osteotomy for maxillary advancement was stabilized with conventional titanium plates and screws in 12 patients (group 1) and with resorbable plates and screws in 10 patients (group 2). Lateral cephalograms were taken before surgery, immediately postoperatively, 8 weeks after surgery, and 1 year postoperatively.

Results: Before surgery both groups were balanced with respect to linear and angular measurements of cranio-facial morphology. One year after surgery, maxillary stability was excellent in both groups. In group 1 no significant correlations were found between maxillary advancement and relapse. In group 2, significant correlations were found between maxillary advancement and relapse at A point and posterior nasal spine. No significant differences in postoperative skeletal and dental stability between groups were observed.

Conclusion: Surgical correction of Class III malocclusion after combined maxillary and mandibular procedures appears to be a fairly stable procedure for maxillary advancements up to 5 mm independent of the type of fixation used to stabilize the maxilla. Resorbable devices should be used with caution for bony movements of greater magnitude until their usefulness is evaluated in studies with large maxillary advancements.

Comment: Although the sample size in this retrospective study was small, it has provided some valuable data on the relative stability of resorbable fixation in maxillary advancements up to 1 year post-operatively. Further work is needed to look at larger magnitudes of movement, different combinations of movements and other skeletal patterns to assess how resorbable fixation performs under these conditions.

Periodontal aspects

Effectiveness of a chlorhexidine dentifrice in orthodontic patients: a randomized-controlled trial. *J Clin Periodontol* 2006; 33: 421–26
Olympio KPK, Bardal PAP, de M Bastos JR, Buzalaf MAR

Objectives: This blind and randomized-controlled trial analysed chlorhexidine dentifrices in relation to dental plaque, gingivitis, bleeding, calculus and enamel extrinsic staining development.

Subjects and method: Volunteers in fixed orthodontic therapy used the following dentifrices: 1100 ppmF, NaF (group A, $n = 27$); experimental, 1100 ppmF, NaF and chlorhexidine 0.95% (group B, $n = 28$); and experimental, chlorhexidine 0.95% (group C, $n = 28$). At

baseline, after 6, 12 and 24 weeks, clinical examinations were carried out. The gingivitis, bleeding and plaque data were tested by ANOVA and Tukey's *post hoc* tests. Stain and calculus data were analysed by Kruskal–Wallis and Dunn's *post hoc* tests ($P<0.05$).

Results: Plaque, gingivitis and bleeding scores improved in all three groups, but up to the 6 and 12 weeks examination the products containing chlorhexidine were statistically better. The chlorhexidine dentifrices significantly increased the mean of the stain index, although most of the patients did not notice the stains. The calculus index was not significantly modified.

Conclusion: This study suggests that the use of dentifrices containing chlorhexidine seems to be effective for the treatment of gingivitis in orthodontic patients, although the intense motivating contact that the volunteers had with the researchers may have also played a role.

Comment: The efficacy of a chlorhexidine containing dentrifice in reducing plaque, bleeding and gingivitis was shown in this study. It must be noted however that the non-experimental group also improved on all three measures. This would appear to be as a result of the motivation of all participants in this trial. The use of a chlorhexidine containing dentrifice would be most beneficial for those patients who are in need of oral hygiene improvement, but arguably these will be the patients who are least likely to comply with such measures. In addition this study only looked at the use of a chlorhexidine dentrifice for 6 months. Longer-term evaluation is needed to assess the effects on taste, calculus formation and staining.

Adjunctive procedures

Orthodontic extrusion with or without circumferential supracrestal fiberotomy and root planning. *Int J Periodontics Restorative Dent* 2006; 26: 87–93

Carvalho CV, Bauer FPF, Romito GA, Pannuti CM, Micheli GD

Aims: The aim of this randomized clinical trial was to carry out a biometric comparison between the orthodontic extrusion (OE, group B) technique and OE combined with root fiberotomy and root planning (OEFRP, group A).

Method: Twenty single-root teeth were extruded and assigned to two different groups. In both groups, fixed orthodontic appliances were activated weekly during the course of 3 weeks. After activation, the extruded teeth were maintained in retention for a period of 8 weeks. In group A, along with weekly activation, fiberotomy and root planning were carried out on the top of the alveolar bone crest.

Results: Statistical analysis revealed that the amount of dental structure exposed was greater in group A, where the gingival margin and bone tissue remained stable ($P<0.05$). Group B presented coronal migration of the gingival tissue and bone tissue of 2 and 1.5 mm, respectively.

Conclusion: The OEFRP technique is indicated when crown lengthening is desired without alteration in the position of the gingival margin. This aspect is of great importance, especially in those cases in which aesthetic involvement is a decisive factor in therapeutic choice. Extrusion without fiberotomy and root planning can be used with success when aiming for coronal dislocation of the periodontal tissues together with the tooth.

Comment: The authors have provided useful data on the efficacy of an adjunctive procedure to minimize the need for crown lengthening following extrusive tooth movements where existing gingival aesthetics are desirable. The effects of such a technique in teeth with periodontal involvement requires further work.