Abstracts

The force-distance properties of attracting magnetic attachments for tooth movement in combination with clear sequential aligners

Angie Phelan,* Peter Petocz,* William Walsh† and M. Ali Darendeliler*

Discipline of Orthodontics, Faculty of Dentistry, University of Sydney* and Surgical and Orthopaedic Research Laboratories, University of New South Wales,† Sydney, Australia

Background: The demand for clear sequential aligner therapy has increased dramatically in recent years. An improved system utilising small neodymium-iron-boron (NdFeB) magnetic attachments has been proposed to enhance appliance capabilities.

Aim: The aim of the investigation was to analyse the force system diagrams produced by small attracting NdFeB magnets to determine, 1) whether the force levels were sufficient to induce tooth movement, 2) the effect of magnet morphology on force characteristics and, 3) the most appropriate magnet dimensions that could be utilised for this application.

Methods: Twenty-nine NdFeB rectangular magnets of varying dimensions were tested. A Mach-1 universal testing machine (Biosyntech Inc, Quebec, Canada) was used to measure the attractive force of pairs of magnets. Measurements commenced with a magnetic pair in contact and subsequently vertically separated a distance of 10 mm at a speed of 12 mm/minute. For all magnetic configurations four repeat measurements were performed on five magnetic pairs of the same size.

Results: The force-distance diagrams for all magnet configurations demonstrated a dramatic decrease in force with increasing magnet separation. Rather than a suggested inverse square law, the experimental data followed an inverse fourth law when an offset determined by a regression analysis was applied to the distance. For the majority of magnets, insignificant forces were attained beyond 2 mm of separation. Magnets with large pole face areas and longer magnetic axes provided the greatest force.

Conclusions: A select range of magnet configurations exhibited suitable and reliable attractive forces and therefore could be advocated for prescribed clinical application.

(Aust Orthod J 2012; 28: 159–169)
Received for publication: March 2012
Accepted: October 2012

Angie Phelan: angie.phelan@gmail.com
Peter Petocz: Peter.Petocz@mq.edu.au
William Walsh: W.Walsh@unsw.edu.au
M. Ali Darendeliler: adarende@mail.usyd.edu.au
A qualitative investigation of specialist orthodontists in New Zealand: Part 2. Orthodontists’ working lives and work-life balance

Kieran J. Soma,* W. Murray Thomson,† Kate C. Morgaine† and Winifred J. Harding†
Private practice, Mont Albert, Victoria, Australia* and Department of Oral Sciences, Sir John Walsh Research Institute, Faculty of Dentistry, The University of Otago, Dunedin, New Zealand†

Background: Orthodontics is the most widely practised form of specialist dentistry in New Zealand. To date, no known qualitative research has been published examining the work-life balance of practitioners.

Aim: The aim of this study was to investigate the working lives and work-life balance of NZ orthodontists in order to generate an understanding of the reality of orthodontic specialist practice and its effects on orthodontists’ professional and personal lives.

Methods: Semi-structured interviews were conducted involving 19 practising orthodontists (four females, 15 males; mean age 50 years) from throughout New Zealand and selected for maximum variation in the sample. Transcribed interviews were analysed for themes using an applied grounded theory approach.

Results: A core category of ‘practising orthodontist’ was derived, and related themes were grouped under the sub-categories of: (a) NZ orthodontic specialist practice; (b) NZ specialist orthodontists; and (c) Work-life balance. The present paper reports on the final sub-category. Themes emerging from the work-life sub-category were further divided into two sub-themes of ‘work’ and ‘life’. Themes in the ‘work’ sub-group included time off, injuries and illness, regrets, personality traits, job stress and criticism, establishing a practice, peer support and contact, and success in orthodontics. Themes in the ‘life’ sub-group were personal development, family life, life balance and interests outside work, and financial security.

Conclusions: This was the first qualitative investigation of the orthodontic profession in New Zealand. The findings provided a valuable insight into the working lives of New Zealand orthodontists and effects on their day-to-day lives. It will be revealing and interesting to observe how the modernisation of orthodontic practice will affect the work-life balance of New Zealand orthodontists in the future.

Received for publication: February 2012
Accepted: June 2012

Kieran J. Soma: Kieran_soma@hotmail.com
W. Murray Thomson: murray.thomson@otago.ac.nz
Kate C. Morgaine: kate.morgaine@otago.ac.nz
Winifred J. Harding: winfred@southnet.co.nz
Comparison of Australian and American orthodontic clinical approaches towards root resorption
Elaine Lim,* Glenn Sameshima,† Peter Petocz+ and Ali Darendeliler±
Private Practice, Melbourne, Australia,* University of Southern California, California, USA,† Macquarie University+ and University of Sydney,± Sydney, Australia

Aims: As part of The Rocky Mountain Travelling Fellowship, a pilot survey was conducted to assess current diagnostic and clinical approaches to the management of orthodontic patients in relation to root resorption.

Methods: Groups comprising Australians (Sydney, New South Wales) and North Americans (Los Angeles, California), in two stages of their orthodontic careers (post-graduate orthodontic students from the University of Sydney and University of Southern California and qualified practising orthodontists) were asked to complete a questionnaire. The questions examined diagnosis and management approaches related to root resorption used in their clinical practice.

Results: Replies demonstrated that there were differences in management depending on operator experience and the country of clinical practice. However, a summarised common approach to orthodontic root resorption comprised (1) the use of an orthopantomogram as a screening diagnostic tool, followed by periapical radiographs for those perceived as ‘higher risk’ patients, particularly individuals with a history of root resorption; (2) a six monthly radiographic review during treatment; (3) the use of light forces and/or rest periods (discontinuous forces) every two to three months; (4) the extraction of deciduous teeth if permanent successors were erupting ectopically and causing damage to adjacent root structures; and (5) the use of fixed retention after treatment.

Conclusion: This project was intended to initiate discussion and form a basis for further investigation into the clinical management of orthodontic root resorption.


Received for publication: April 2011
Accepted: July 2012

Elaine Lim: elim@yolandim.com.au
Glenn Sameshima: sameshim@usc.edu
Peter Petocz: peter.petocz@mq.edu.au
Ali Darendeliler: adarende@mail.usyd.edu.au
An investigation of cephalometric and morphological predictors of successful Twin Block therapy
Padhraig S. Fleming,* Usman Qureshi,* Nikolaos Pandis,† Andrew DiBiase+ and Robert T. Lee+
Institute of Dentistry, Queen Mary University of London, London, United Kingdom,* University of Bern, Switzerland† and East Kent Hospitals, United Kingdom+

Objective: To identify predictors of overjet reduction, changes in mandibular length (Co-Me) and antero-posterior changes in mandibular position (Pog-Vert) during Twin Block therapy. Methods: Pre- and post-treatment cephalograms of 131 participants were analysed (Mean age 12.73 years ± 1) following Twin Block therapy.

Results: Mean annualised overjet reduction was 7.29 mm (± 2.99) with chin projection improving by 2.66 mm (± 5.37). The magnitude of the initial overjet was a strong predictor (95% CI: 0.30, 0.77, p < 0.01) of overjet reduction and change in chin position (95% CI: 0.08, 0.77, p = 0.02). Greater forward movement of Pogonion occurred if there was greater retrusion of Pogonion at the outset (95% CI: 0.15, 0.45, p < 0.01). No prognostic relationship was noted for other potential cephalometric predictors including pretreatment mandibular lower border morphology and Co-Go-Me angle.

Conclusion: No relationship between mandibular morphology, vertical skeletal pattern and favourable dentoalveolar and skeletal responses to Twin Block therapy could be found. These results require confirmation on an external sample.

Received for publication: March 2012
Accepted: July 2012

Padhraig Fleming: padhraig.fleming@gmail.com
Usman Qureshi: usman76@yahoo.co.uk
Nikolaos Pandis: npandis@yahoo.com
Andrew DiBiase: andrew.dibiase@ekht.nhs.uk
Robert Lee: r.t.lee@qmul.ac.uk
Occlusal bite force changes during 6 months of orthodontic treatment with fixed appliances
Sawsan A. Alomari and Elham S. Abu Alhaija
Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan

Background: Occlusal bite force (OBF) is reported to change during fixed appliance orthodontic treatment.

Aims: The aim of the present study was to determine bite force changes during the first 6 months of fixed appliance orthodontic treatment and to investigate the relationship between patients’ subjective pain levels and recorded changes in OBF.

Methods: Forty-seven subjects (34 females, 13 males) were recruited from the Dental Teaching Centre at the Jordan University of Science and Technology. The subject’s ages ranged between 18 and 26 years (average 19.0 ± 3.36 years). Bite force was measured using a portable OBF gauge at nine time intervals (T0 - T8). At each OBF recording, subjects were asked to describe their subjective pain level using a visual analogue scale (VAS). A repeated-measures analysis of variance and a Bonferroni post-hoc comparison test were applied to determine differences at the various time intervals.

Results: Bite force significantly reduced during the first month of orthodontic treatment and approximately 50% of pretreatment OBF was lost by the end of the first week. However, bite force recovered to pretreatment levels by the end of the sixth month. Visual analogue pain scores were higher during the first 2 weeks of treatment and were positively correlated with the OBF loss.

Conclusion: OBF reduced during the first month of orthodontic treatment but, with time, recovered to pretreatment levels.

Received for publication: December 2011
Accepted: Accepted July 2012
Sawsan A. Alomari: saalomari@just.edu.jo
Elham S. Abu Alhaija: elham@just.edu.jo
Bone density and miniscrew stability in orthodontic patients

Vilas Samrit,* Om Prakash Kharbanda,* Ritu Duggal,* Ashu Seith† and Varun Malhotra*

Division of Orthodontics and Dentofacial Deformities, Centre for Dental Education and Research* and Department of Radio-Diagnosis,† All India Institute of Medical Sciences, New Delhi, India

Objectives: The purpose of this study was to evaluate bone density in buccal inter-radicular bone between second premolars and first permanent molars and its association with the clinical stability of miniscrews used for en masse retraction of anterior teeth in extraction cases.

Materials and Methods: Thirty-eight miniscrews were placed in ten patients (8 females, 2 males: mean age, 18.9 ± 4.12 years) to provide indirect orthodontic anchorage. Twenty miniscrews were placed in the maxilla and eighteen were inserted in the mandible. All of the miniscrews were placed in the buccal inter-radicular bone between the second premolar and the first permanent molar. Bone density at each miniscrew site was recorded by computed tomography and recorded in Hounsfield units (HU) before miniscrew placement. Nickel-titanium closed-coil springs were used to apply an orthodontic force of 2N within one week following placement.

Results: Cortical bone density values ranged from 506.7 - 1705.6 HU (Mean, 929.27 ± 322.12 HU) in the maxilla and 503.8 - 1544.8 HU (Mean, 1116.2 ± 298.33 HU) in the mandible. Cancellous bone density values ranged from 185.9 - 930.8 HU (Mean, 450.09 ± 205.66 HU) in the maxilla and 197.3 - 803.6 HU (Mean, 561.87 ± 170.83 HU) in the mandible. There was no statistically significant difference between right and left sides. A bone density comparison between the maxilla and mandible revealed statistically significant higher values in mandibular cortical bone (p = 0.008), while no significant difference was found in cancellous bone values (p = 0.097). Clinically, the success rate of miniscrews in the maxilla was 100% but only 77.8% in the mandible. Miniscrew failures were associated with peri-implant inflammation and miniscrew proximity to dental roots. No relation was found between bone density and miniscrew stability.

Conclusion: The present study determined that no definitive association could be established between miniscrew success and bone density.

(Aust Orthod J 2012; 28: 204–212)
Received for publication: December 2011
Accepted: July 2012

Vilas Samrit: drsam_vilas@yahoo.co.in
Om Prakash Kharbanda: opk15@hotmail.com
Ritu Duggal: rituduggal@rediffmail.com
Ashu Seith: ashubhalla1@yahoo.com
Varun Malhotra: drvarunmalhotra@gmail.com
The effects of a vibrational appliance on tooth movement and patient discomfort: a prospective randomised clinical trial

Peter Miles,*† Heath Smith,† Robert Weyant+ and Daniel J. Rinchuse†
Private Practice, Caloundra and University of Queensland Department of Orthodontics, Australia,* Seton Hill University Graduate Program in Orthodontics, Greensburg, Pennsylvania, USA† and Department of Dental Public Health and Information Management, School of Dental Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania, USA+

Introduction: The aim of this study was to assess the rate of tooth movement and discomfort experienced by orthodontic patients using a vibrational appliance (Tooth Masseuse).

Methods: In this randomised controlled trial (RCT), 66 consecutive patients were assigned to a control or experimental group. The experimental group was instructed to use a vibrational appliance for a minimum of 20 minutes per day. All of the patients had the same fixed appliance and a 0.014 inch thermal NiTi wire during the 10 week study period. Impressions of the mandibular six anterior teeth were taken at 4 time points: at the start of treatment, 5 weeks, 8 weeks, and at 10 weeks after commencement. Little's Irregularity Index was used to record alignment and assess the rate of tooth movement. A discomfort score chart was used to evaluate patient pain levels at 5 time points.

Results: The experimental group showed a 65% reduction in irregularity at 10 weeks, while the control group showed a 69% reduction in irregularity over the same period. No significant differences in irregularity or pain levels were observed at any of the time points between the groups.

Conclusions: The results demonstrate that, for 20 minute use per day, there appears to be no clinical advantage in using the vibrational appliance for the early resolution of crowding or the alleviation of pain during initial alignment.

Received for publication: July 2012
Accepted: August 2012

Peter Miles: pmiles@beautifulsmiles.com.au
Daniel J. Rinchuse: drinchuse@setonhill.edu
A pharmacodynamic investigation into the efficacy of osteoprotegerin during aseptic inflammation

Linda Curl, Christopher Barker, Craig Dreyer and Wayne Sampson
Orthodontic Unit, School of Dentistry, The University of Adelaide, Adelaide, South Australia, Australia

Background: Osteoprotegerin (OPG), as an osteoclast antagonist, limits mineralised tissue resorption under physiological conditions. Previous work investigating OPG in a rat periodontal ligament (PDL) ankylosis model found no inhibitory effect on osteoclasts when OPG was administered at a dosage of 2.5mg/kg.1,2

Aims: The object of this study was to determine whether dosages higher than 2.5 mg/kg of OPG were required to limit osteoclastic activity in an aseptic inflammatory model in rats.

Materials and methods: Dry ice was applied for 15 minutes to the upper right first molar crown of eighteen, 8-week-old, male Sprague-Dawley rats. Three groups of 3 were injected with OPG at dosages of 2.5, 5.0 and 7.5 mg/kg of body weight immediately following the thermal insult. After 7 days, the rats were sacrificed and each maxilla processed for histological examination and stained for osteoclastic activity using tartrate-resistant acid phosphatase (TRAP). Osteoclast population numbers were estimated via light microscopy and results were analysed using a comparative mixed model statistical analysis.

Results: Results showed OPG inhibited osteoclastic activity in a dose-dependent manner. From 2.5 mg/kg to 7.5 mg/kg, osteoclast populations were linearly reduced by 39.78% (p < 0.05). OPG did not appear to affect the inflammatory process and had varied efficacy in different regions of individual teeth.

Conclusion: Although osteoclastic activity reduced, it was not completely eliminated, perhaps because dosages were still inadequate, or additional factors might influence OPG and osteoclast activation in the aseptic inflammatory model.

Received for publication: June 2012
Accepted: September 2012

Linda Curl: curl80@hotmail.com
Christopher Barker: cwdbarker@yahoo.com
Craig Dreyer: craig.dreyer@adelaide.edu.au
Wayne Sampson: wayne.sampson@adelaide.edu.au
Subjective symptoms of RME patients treated with three different screw activation protocols: a randomised clinical trial

Koray Halıcıoğlu,* Ali Kiki† and İbrahim Yavuz+
Department Orthodontics, Faculty of Dentistry, Abant İzzet Baysal University, Bolu,* Department Orthodontics, Faculty of Dentistry, Atatürk University, Erzurum† and Department Orthodontics, Faculty of Dentistry, Erciyes University, Kayseri,+ Turkey

Aims: The purpose of the present study was to evaluate the subjective symptoms of patients during the active phase of rapid maxillary expansion (RME) treatment, and further, to assess the differences between three different RME activation protocols.

Materials and methods: The clinical sample consisted of 60 patients (mean age 13.5 years) with maxillary transverse deficiency requiring expansion. The subjects were randomly divided into three groups on which different expansion protocols were performed. An evaluation of the subjective symptoms was carried out by a Numerical Rating Scale (NRS). The patients completed questionnaires after the first, fifth, tenth, twentieth and final activations. A Shapiro-Wilk test was applied to evaluate homogeneity; a Kruskall Wallis test was performed for gender-related differences and to compare the different activation schedules. The Wilcoxon test was used to compare the activations at the various time intervals.

Results: No gender-related differences were found. Ninety-eight percent of the patients reported pain during RME. There were no specific differences between groups except for the pain perceived at the twentieth activation. In all groups, pain, the sensation of pressure and its duration were highest at the fifth activation. Subjective symptoms tended to decrease after the fifth and tenth activations. Headache and dizziness were minimal.

Conclusion: Different activation protocols did not appear to alter subjective symptoms encountered during RME. The majority of the patients undergoing RME suffered pain and pressure sensations especially after the fifth activation.

Received for publication: January 2012
Accepted: October 2012

Koray Halıcıoğlu: korayhalicioglu@hotmail.com or koray.halicioglu@ibu.edu.tr
Ali Kiki: akiki25@hotmail.com
İbrahim Yavuz: iyavuz@erciyes.edu.tr
Measurements from conventional, digital and CT-derived cephalograms: a comparative study
Ahmed Ghoneima,*† Sahar AlBarakati,†+, Asli Baysal,± Tancan Uysal± and Katherine Kula†
Department of Orthodontics, Faculty of Dental Medicine, Al-Azhar University, Cairo, Egypt,* Department of Orthodontics and Oral Facial Genetics, Indiana University School of Dentistry, Indianapolis, USA,† Department of Pediatric Dentistry and Orthodontics, College of Dentistry, King Saud University, Riyadh, Saudi Arabia,+ and Department of Orthodontics, Faculty of Dentistry, Izmir Katip Celebi University, Izmir, Turkey±

Objective: The purpose of this retrospective radiographic study was to determine the reliability and reproducibility of skeletal and dental measurements of lateral cephalograms created from a computerised tomography (CT) scan compared with conventional and digital lateral cephalograms.

Methods: CT and conventional lateral cephalograms of the same patients were obtained from university archives. The lateral cephalometric radiographs of 30 patients were manually traced. The radiographs were subsequently scanned and traced using Dolphin Imaging software version 11 (Dolphin Imaging, Chatsworth, CA, USA). The CT-created lateral cephalograms were also traced using the same software. Sixteen (10 angular and 6 linear) measurements were performed. Cephalometric measurements obtained from conventional, digital and CT-created cephalograms were statistically compared using repeated measures analysis of variance (ANOVA). Statistical significance was set at the p < 0.05 level of confidence.

Results: The intra-rater reliability test for each method showed high values (r > 0.90) except for mandibular length which had a correlation of 0.82 for the CT-created cephalogram. Five measurements (N-A-Pog, N-S, ANS-PNS, Co-ANS and Co-Gn) were found to be significantly different between the CT-created and conventional cephalograms and three measurements (SNB, ANB, and /1-MP) were found to be significantly different between the CT-created and digital cephalograms.

Conclusions: There are statistically-significant differences in measurements produced using a traditional manual analysis, a direct digital analysis or a 3D CT-derived cephalometric analysis of orthodontic patients. These differences are, on average, small but because of individual variation, may be of considerable clinical significance in some patients.

Received for publication: January 2012
Accepted: October 2012

Ahmed Ghoneima: aghoneim@iupui.edu
Sahar AlBarakati: salbarakati@gmail.com
Asli Baysal: baysalasli@hotmail.com
Tancan Uysal: tancanuysal@yahoo.com
Katherine Kula: kkula@iupui.edu
Qualitative and quantitative evaluation of enamel after various post-stripping polishing methods: an in vitro study
Priyanka Gupta,* Nitin Gupta,† Nirav Patel,+ Ravi Gupta,‡ Gurinderpal Singh Sandhu± and Charudatta Naik‡
Private Practice, Panchkula,* Department of ENT, Government Medical College and Hospital-32, Chandigarh,† Ahmedabad Dental College, Ahmedabad,+ Department of Orthodontics, Dr D.Y. Patil Dental College and Hospital, Maheshnagar, Pimpri, Pune± and Bhojia Dental College and Hospital, Baddi, Distt. Solan‡

Aim: The purpose of this study was to evaluate the ultramorphology and surface roughness of permanent tooth enamel after various post-stripping polishing methods.

Methods: Sixty extracted, permanent lower incisors were randomly assigned to two groups (Group A and Group B). Group A was morphologically assessed by a scanning electron microscopy (SEM) and Group B was assessed by a stylus profilometer which applied a surface roughness test. Each group was divided into five subgroups of six incisors. Four of the subgroups were subjected to interproximal enamel reduction, followed by various polishing methods; the fifth subgroup served as a control. The polishing methods comprised; Subgroup 1, diamond disk followed by a fine Sof-l ex disc; Subgroup 2, diamond disk and fine diamond bur; Subgroup 3, diamond disk and fine tungsten carbide bur; Subgroup 4, diamond disk and chemical stripping using 37% orthophosphoric acid in conjunction with a fine 3M finishing strip and Subgroup 5 (control), no stripping nor polishing. Qualitative (scanning electron microscopy) and quantitative (surface roughness test) assessments were performed. Surface roughness values (Ra) for permanent enamel were evaluated using the Welch analysis of variance (ANOVA).

Results: Subgroup 1 (diamond disk and fine Sof-l ex disc) produced the smoothest enamel surface and Subgroup 4 (chemical stripping) produced the roughest enamel surface.

Conclusions: All proximal stripping and polishing methods significantly roughened the enamel surfaces. The best results were obtained when the stripped enamel surfaces were polished and finished with fine Sof-l ex discs.

(Aust Orthod J 2012; 28: 240–244)
Received for publication: May 2012
Accepted: October 2012

Priyanka Gupta: drguptapriyanka@gmail.com
Nitin Gupta: nitinent123@gmail.com
Nirav patel: niravpatel001@gmail.com
Ravi Gupta: smileperfect@rediffmail.com
Gurinderpal Singh Sandhu: drsandhugary@gmail.com
Charudatta Naik: drcrnaik@yahoo.co.in
Correction of severe tooth rotations using clear aligners: a case report
Gianluigi Frongia and Tommaso Castroflorio
Private practice, Turin, Italy

Background: The present adult patient case report shows the correction of a crossbite malocclusion and severe tooth rotations treated with the Invisalign system.

Methods: A 27-year-old female with a dental crossbite (24, 34), severe rotations of two lower incisors (more than 40°) and malalignment of the upper and lower arches is described. The Invisalign system was treatment planned to correct the malocclusion.

Results: The treatment goals of crossbite, rotation and malalignment correction were achieved after 12 months of active aligner therapy. The overbite improved (2.5 mm before treatment, 1 mm at the end); the dental crossbite, the crowding and the severe tooth rotations (with a mean of 2° of improvement per aligner) were corrected.

Conclusions: After treatment, the dental alignment was considered excellent. The presented case indicates that the Invisalign system can be a useful appliance to correct a dental malocclusion involving severe rotations.

Received for publication: September 2011
Accepted: July 2012

Gianluigi Frongia: gianluigi_frongia@msn.com
Tommaso Castroflorio: tcastroflorio@libero.it
Skeletal Class III malocclusion with thin symphyseal bone: a case report
Eriko Hikida* and Chihiro Tanikawa†
Private Practice, Osaka* and Department of Orthodontics and Dentofacial Orthopedics, Osaka University, Osaka,† Japan

Aim: To describe the management of a severe skeletal Class III patient with thin symphyseal bone and alveolar bone covering the mandibular incisors.

Method: A 24 year-old female presented with a skeletal Class III malocclusion characterised by thin alveolar bone in a mildly crowded, mandibular incisor region. Computerised tomography (CT) assisted in the determination of possible tooth movement within the anterior mandibular alveolar bone. The finalised treatment plan aimed to align the maxillary and mandibular dental arches following the extraction of the maxillary right first premolar and the mandibular right permanent lateral incisor. The surgical repositioning of the maxilla and mandible with a LeFort I osteotomy and a bilateral sagittal split osteotomy (BSSO) would follow.

Results: After treatment, an acceptable facial profile and a solid intercuspation of the teeth were obtained. Significant root resorption was not observed. The occlusion remained stable with normal overjet and overbite after two years of retention.

Conclusion: CT examination provided an assessment of the three-dimensional morphological characteristics of anterior alveolar bone which enabled an evaluation of possible tooth movement.

Received for publication: March 2011
Accepted: October 2012

Eriko Hikida: tetete9@gmail.com
Chihiro Tanikawa: ctanika@dent.osaka-u.ac.jp
Uprighting of severely impacted mandibular second molars: a case report
Tadashi Fujita, Maya Shirakura, Hidetaka Hayashi, Yuji Tsuka, Eri Fujii and Kazuo Tanne
Department of Orthodontics and Craniofacial Developmental Biology, Applied Life Sciences, Hiroshima University Institute of Biomedical and Health Sciences, Hiroshima, Japan

Introduction: The incidence of mandibular first and second molar impaction is increasing but still recorded as rare. Treatment methods involving uprighting, extraction, or autologous tooth transplantation have been described.

Aim: The present study describes the uprighting of 3 impacted mandibular second molars presenting with eruptive disorders.

Methods: The application of limited and appropriate orthodontic therapy completed treatment in 11 months, 5 months, and 2 years and 3 months, respectively. Although no absolute anchorage in the form of miniscrews was required, no significant anchorage demands were considered necessary. Although the third molar tooth germs were identified and preserved in each case, no adverse influence on the uprighting of the second molars was encountered.

Results: The favourable molar repositioning results were likely due to the youth of the 3 patients as the third molars were in early development and bone remodelling was marked. Furthermore, no problems related to anchorage or alveolar bone loss were identified after treatment.

Conclusion: The results indicated the benefits of limited orthodontic treatment and early intervention for the uprighting of impacted mandibular second molars.

(Aust Orthod J 2012; 28: 258–264)
Received for publication: April 2012
Accepted: October 2012

Tadashi Fujita: seven@hiroshima-u.ac.jp
Maya Shirakura: maya714tama@hiroshima-u.ac.jp
Hidetaka Hayashi: hayashihide@hiroshima-u.ac.jp
Yuji Tsuka: d102580@hiroshima-u.ac.jp
Eri Fujii: fujii-eri@hiroshima-u.ac.jp; Kazuo Tanne: tanne@hiroshima-u.ac.jp