



ORIGINAL ARTICLE

Facilitating orthodontic teeth extraction—A technique suggestion



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KEYWORDS

Orthodontic teeth extraction;
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Abstract *Introduction:* Extractions are routinely used in orthodontics as a method of gaining space. Sometimes the closures of these extraction spaces become problematic for the treating clinician. Many causes have been cited for such a mis-happening, one of it being narrowed out ridge due to fractured cortical plate, which often occurs during a traumatic extraction. Hence, any technique that facilitates teeth removal atraumatically and thus decreases the possibility of such a complication is welcome. *Aims and objectives:* To test a novel method utilizing localized inflammatory response in easing orthodontic extractions. *Material and method:* 40 individuals were included in this split mouth prospective clinical study. In all these subjects, teeth destined for extraction were bonded and engaged with arch wire on one side of the arch and the other side was used as control. Ease of extraction was compared and assessed by the dentist and the patients using four point Likert scale. The values obtained were used for statistical analysis. *Result:* Both the dentist and the patients perceived the extraction on the test side being easy, with less discomfort postoperatively with the difference between the test and the control being statistically significant. *Conclusion:* Localized inflammatory response in the periodontium of teeth destined for extraction can be used to facilitate their removal, thereby easing out the procedure both for the dentist and the patient. © 2015 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Orthodontic treatment often involves the extraction of teeth to gain space for the correction of crowding or proclined teeth. While, for the patient and the general practitioners (GP)

performing the procedure the principal concern is to successfully complete the procedure atraumatically, for the orthodontist there is an additional prospective to preserve the cortical plates from breaking during extraction which can lead to ridge narrowing. Fractured cortical plates can lead to narrowed out ridges that may interfere with complete closure of extraction space closure.¹ Therefore, any technique that eases tooth removal with minimal trauma to the cortical plates is welcome. No such technique was found in the literature search by the author that specifically addresses orthodontic tooth extractions. Background orthodontic extractions are conventionally done preceding the formal banding and bonding procedure. However, in most if not all cases it is possible to delay it by

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ten to fifteen days following strap up. Also, it is a known fact that placement of bracket and engaging wire in the slot applies force to the tooth and leads to a slight widening of periodontal space due to a localized inflammatory response (also called as regional acceleratory phenomena or RAP) that sets in as a response to force application and is clinically observed as a slight increase in tooth mobility.²

1.1. Aim and objective

The aim of this study was to explore the possibility of utilizing this localized inflammatory response as a mean of facilitating orthodontic tooth extraction for the dentist and make it less traumatic for the patient. The null hypothesis propounded that there was no difference in response perceived by the dentist or the patients between the test (tooth bonded) and the control side (tooth not bonded).³

1.2. Material and methods

A split mouth prospective clinical study was designed to include 40 orthodontic patients treated by the author from December 2011 to September 2014. Individual who met the following criteria were included in this study:

1. Malocclusion group: class I bimaxillary protrusion or class I crowding cases with crowding not exceeding 6 mm in the labial segment.
2. Treatment involved extraction of all first permanent premolars as a part of treatment plan.
3. Full complement of permanent teeth present and erupted (from first molar to first molar in both the arches). Second molars must be present. Individuals were included even if the second molars were still erupting and had not reached the occlusal plane due to a generalized delay in dentition without any underlying systemic or local cause.
4. Healthy first premolars or with minimal caries/restorations and definitely no endodontic treatment. Care was taken that the cases included had a relatively standard root form and shape which were symmetrical on both the sides of the arch and were free from dilacerations or any other malformation that is a documented causative of difficult extraction.
5. The teeth on both the sides must be in occlusion and free from cross bite, as it is a known fact that there is a widened periodontal space around non occluding teeth. Also, the teeth should be positioned in the arch in a way making them feasible to bracket bonding.
6. Individuals with any gross distortions in the arch form unilaterally or bilaterally were excluded from the study.
7. Relatively good oral hygiene and a healthy periodontium.
8. Patient's with bilateral mandibular tori in the premolar region were included in this study; however, if the torus was unilateral the subjects were excluded.
9. Age: 15–25 years old individuals who were apparently free from any underlying medical conditions as revealed by their medical history.⁴
10. Gender: neutrality was maintained since every subject served as their own control.

11. Individuals gave a signed consent to be included in this study. As a token of gratitude, for participation in the study the extractions were done at half the price of the normal procedural charge to the participants.

1.3. Procedure

All the teeth were bonded at the time of strap up in case of bimaxillary protrusion patient and those possible in case of crowding cases. The first premolars on one side of the mouth were always included in the initial bonding. The other side was excluded from the bonding and acted as control. All the inclusions had premolars bonded alternately on right and left side (example, if subject 1 had upper and lower first premolars bonded on the right side, subject 2 had it on the left side and subject 3 again on the right side and so on). This was done to eliminate the confounding factor of ease which the dentist has while performing extraction due to their being right handed or left handed (e.g. a right handed dentist finds right side extractions easy). The initial wire placed in all the patients was either 0.014" HANT (heat activated nickel titanium) or 0.016" HANT wire (3M Unitek Corporation, Monrovia, California, USA) in both the arches. The patients were recalled after one week of strap up for initial check up and teeth extraction. The side to which brackets were bonded on premolars destined for extraction was always extracted first. This was done to prevent the GP from identifying the difference between the two sides being tested. On the extraction appointment, the patient was examined by the orthodontist who de-bonded the bracket and cleaned the tooth surface of any residual composite before handing over the case to the GP dentist for extraction. All the extractions were carried out using 2% 1:100000 Xylocaine™ Dental (Dentsply Pharmaceutical, 3427 Concord road, York) using infraorbital and palatal infiltration for maxillary tooth and mental nerve block for mandibular tooth. The patient's were prescribed with routine analgesics and antibiotics post extraction. The contra lateral side was extracted after 15 days at the time of monthly orthodontic adjustment appointment.⁵ After removal of teeth the GP dentist was asked to rate on a four point Likert scale their perception of extraction as: 1. Very difficult, 2. Difficult, 3. Easy, 4. Very easy. The same scale was also used to assess the patient's perception of the discomfort level after three days on the recall appointment for check up post-extraction and was asked to compare which one they found easy and/or had less discomfort post extraction (Table 1).

1.4. Statistical analysis

Mann Whitney *U* test was used to compare the patient's and the dentist's perception of extraction at two extraction appointments (T: When the test side was extracted; C: When the control side was extracted) Wilcoxon Sign Rank test was used to compare the direction of response of the patient and the dentist on the test and the control side independently. GraphPad Prism™ (GraphPad Software, Incorporation, California, USA) statistical software was used for data analysis. The result of this study has been tabulated in Tables 2–5. A look at the response of both the patient and the dentist shows that extraction on the test side (where bracket bonding and

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