

Case Report

Severe Gingival Recession Caused by Orthodontic Rubber Band: A Case Report

Hamid Moghaddas¹ • Arezou Pezeshkfar^{2*}

¹Professor, Department of Periodontics, Dental School, Shahid Beheshti University of Medical Sciences, Tehran, Iran

²Post-graduate Student, Department of Periodontics, Dental School, Shahid Beheshti University of Medical Sciences, Tehran, Iran

*Corresponding Author; E-mail: arezoupezeshkfar@yahoo.com

Received: 12 July 2010; Accepted: 8 December 2010

J Periodontol Implant Dent 2010; 2(2):83-87

This article is available from: <http://dentistry.tbzmed.ac.ir/jpid>

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Abstract

The destructive effects of improper use of orthodontic elastic bands are well documented in the dental literature. Numerous cases of iatrogenic periodontal destruction have been reported since 1870. Despite these well-documented hazards, such incidents still occur.

This case report describes a patient who was referred to a dentist by his orthodontist for closing the residual midline diastema by composite resin. However, the clinician used an elastic band to close the diastema for better results; thereafter, he restored the lateral teeth. However, a subgingivally hidden elastic band migrated apically and destroyed both the periodontal ligament and the alveolar bone, with subsequent gingival recession.

This report describes the approach that was used to save the involved teeth and the root coverage procedure.

Key words: Gingival recession, orthodontic elastic band, periodontal destruction.

Introduction

The destructive effects of improper use of orthodontic rubber bands are well documented in the dental literature.¹⁻¹⁰ Elastics have long been used for the correction of orthodontic problems such as diastema,^{4,5} crossbites,⁷ and malposed teeth,^{4,6} as well as for the intentional non-surgical removal of teeth in cases of hemophilia and other medical conditions.¹ Unfortunately, numerous cases of iatrogenic periodontal destruction have been reported in the dental literature since 1870, when McQuillen published his warning against improper use of the Indian rubber ring.¹⁰ In the patient described in that report both cen-

tral incisors were lost.

Whether the extraction is intentional or not, the principle is the same. A constricting elastic band, placed around the cervix of the tooth, moves toward the apex, where the root is the narrowest, destroying both the periodontal ligament and the alveolar bone, with the subsequent exfoliation of the tooth.¹¹ Exfoliation of the tooth usually involves incisors or premolars because the divergent roots of molars restrict complete movement of the elastic band apically; this event has not been reported, although gingival inflammation and loss of periodontal attachment and bone can occur.^{12,13}

Despite these well-documented hazards, such inci-

dents still occur.

The following report describes the consequences of improper use of elastics in an attempt to close a central maxillary diastema and explains the approach adopted to save the involved teeth and at the same time to cover the denuded roots; the roots had been denuded subsequent to gingival recession.

Case report

A 21-year-old male was referred to the Periodontics Department, Shahid Beheshti University of Medical Sciences, by his orthodontist because of severe gingival recession of maxillary central incisors (Figure 1). The patient's records revealed that after the completion of orthodontic treatment, while he was in the "retention phase," severe gingival recession had occurred on the labial aspect of maxillary central incisors. The orthodontic treatment had been initiated 4 years before and terminated after 2.5 years. Thereafter, the "retention phase" had begun with a "Hawley appliance." He had been wearing it until the appearance of gingival recession. As a consequence, the orthodontist had discontinued utilization of the appliance and had referred the patient.

The clinical examination revealed these findings:

1. Gingival recession on the labial aspect of both maxillary central incisors, which extended apically to about one-half of the root length.
2. The interdental gingiva of mesial and distal aspects of both central incisors had relatively normal appearance and was at normal position.
3. Both central incisors exhibited Class II mobility.
4. There were deep periodontal pockets on distal surfaces of central incisors; however, pocket depth was normal on their mesial surfaces.
5. Oral hygiene was adequate.

Radiographic examination disclosed severe bone loss on the distal surfaces of central incisors, which extended to the apical third of the roots, while bone height on the mesial surfaces appeared normal (Figure 2).

The occlusal evaluation showed no premature con-



Figure 1. Severe gingival recession.



Figure 2. Periapical view of the involved teeth.

tacts in centric and eccentric relations. However, fremitus of both maxillary central incisors was detected at centric occlusion.

Both teeth responded to electric and thermal vitality tests. There was no gingival inflammation, periodontal pockets or bone loss in other areas of the mouth.

Surgical Treatment

Because of the isolated severe resorption of the alveolar bone, we decided on surgical exposure of the site, with simultaneous root coverage procedure. As a technique for root coverage, "Subpedicle connective tissue graft" was selected. Under local anesthesia, two wedge-shaped internal bevel incisions were made on the labial surface of each central incisor, on both sides of recession, to eliminate the epithelium. Then "submarginal "horizontal incisions were made 2 mm away from the gingival margin of lateral incisors. The aim of preserving the marginal gingiva was prevention of gingival recession. These horizontal incisions extended to the mesial of canines. At this point vertical incisions were made and extended beyond the mucogingival junction (Figure 3). Then two partial-



Figure 3. Submarginal and vertical incisions were made to prepare lateral pedicles.

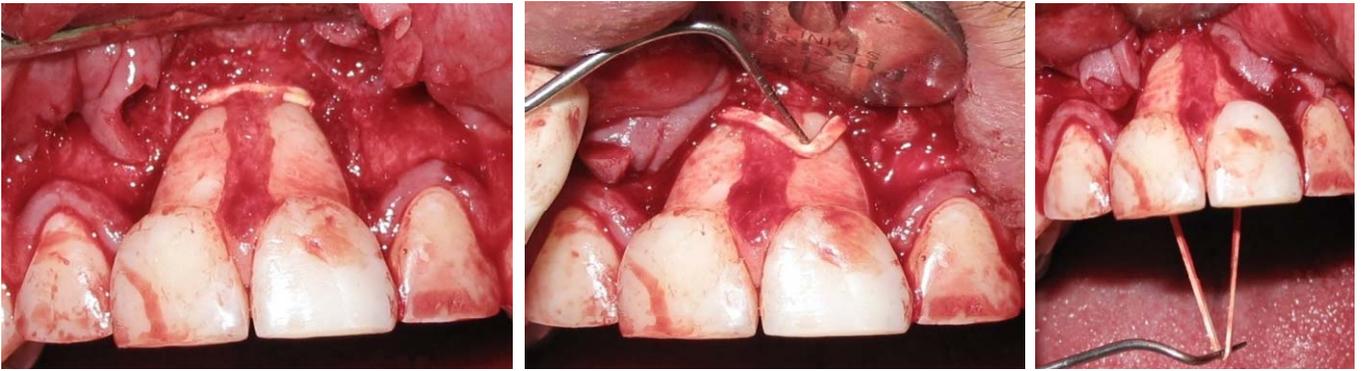


Figure 4. The orthodontic elastic band around the apices of the central incisors as well as the loss of bone on the labial and distal aspects of the incisors can be seen.

thickness flaps were reflected. To eliminate tension on the flaps, “cut-back” incisions were made at the end of vertical incisions.

Surgical exposure revealed severe periodontal destruction on the distal and labial surfaces of both central incisors. However, bone level on their mesial surfaces was normal. After removal of granulation tissue, no clinically detectable microbial plaque or calculus was found on root surfaces, but an orthodontic rubber band was unexpectedly exposed around the apices of the central incisors (Figure 4). The elastic was cut with scissors and removed and the site was thoroughly debrided. The root surfaces were conditioned with Doxycycline solution. One mL of sterile water was mixed with the contents of one capsule and

applied on the denuded roots for 1 minute and then the region was irrigated with normal saline. Then the palatal connective tissue was prepared and transferred to the recipient site. Resorbable sutures were used to secure it in position, engaging the interdental papilla (Figure 5). Then the prepared pedicles were positioned laterally to cover the connective tissue in order to protect and maximize the blood supply (Figure 6). On the other hand, the occlusal contacts were reduced on the central incisors by a diamond bur because of insufficient bone support. Surgical sites were covered with periodontal dressing.

The patient was prescribed 500-mg amoxicillin capsules tid for 7 days and instructed to take an analgesic (400-mg ibuprofen tablets, tid.) as necessary and rinse with 0.2% chlorhexidine twice daily for 3 weeks. The patient was asked not to perform mechanical oral hygiene procedures for at least 3 weeks. A soft diet was suggested to the patient. The dressing was removed after a week and the area was irrigated with chlorhexidine. Sutures were removed after two weeks.



Figure 5. The connective tissue graft was placed on the denuded roots and stabilized by resorbable sutures.



Figure 6. The connective tissue was covered by lateral pedicles.

Discussion

When an elastic band slips into the gingival sulcus, it cannot be detected radiographically or distinguished from normal tissue by probing. Nevertheless, signs of localized periodontal inflammation, such as redness, edema, tooth mobility, and tenderness to percussion, in conjunction with a careful assessment of the patient’s dental history, can lead to an early diagnosis and removal of the elastic before osseous damage occurs.

However, in the patient described in this report, there was no remarkable sign of marginal inflammation, redness and tenderness to percussion. The history obtained from the patient did not reveal any useful information. However, after completion of the surgery and detecting the elastic band, the patient re-



Figure 7. Clinical photograph before and 5 months after surgery.

membered that after completion of the orthodontic treatment he had been referred to a restorative dentist to close the residual maxillary diastema with composite resin restorative material. But the dentist had used latex elastics to close the diastema for optimal esthetic results and then had restored the lateral incisors. The patient pointed out that the elastic band had been removed by the dentist, but it turned out that one of the elastics had slipped under the gingival margin without the dentist noticing it.

To prevent these complications in patients treated with elastics, the following precautions are recommended:⁴

1. Elastics should not be used around the crowns of teeth without being stabilized by some kind of attachment or bracket, either directly bonded to the teeth or welded to orthodontic bands.
2. The patient must be aware of the presence or disappearance of the elastics. If the patient complains of pain, or if gingival inflammation appears, the dentist should suspect the subgingival movement of the elastic.
3. Manufacturers of orthodontic elastic bands should incorporate radiopaque materials into the elastics to enable radiographic diagnosis.

On the other hand, at least six mechanical techniques



Figure 8. Comparison of preoperative and 5-month postoperative radiographs, showing alveolar bone regeneration around the central incisors.

have been proposed to close midline diastema; the use of elastics alone without additional mechanical device used as a preventive measure is contraindicated.¹⁵ If active closure of the diastema is needed, removable acrylic resin appliances or fixed orthodontic appliances are the recommended modality of treatment.¹⁶

The evaluation of similar case reports revealed that gingival inflammation and tenderness are part of patients' chief complaints. But there were none of them in this patient and severe gingival recession was the chief complaint.

Gingival recession has different causes as follows:

- Traumatic tooth brushing
- Poor oral hygiene and accumulation of microbial plaque and calculus
- Anatomic factors (fenestration, dehiscence, prominent root surfaces)
- Self-inflicted gingival recession
- Uncontrolled orthodontic movement
- Frenal and muscle attachments
- Iatrogenic factors (overcontoured restorations, overhangs, restorations with margins that extend deeply into gingival sulcus)

None of the above-mentioned was the primary cause of gingival recession in this patient. Instead, apical migration of an elastic band which led to periodontal destruction was the causative factor. However, this factor may fall into the "iatrogenic group."

A common radiographic finding of these cases is the extreme proximity of the two apices of the involved teeth because of the presence of an elastic band in this area with its pressure effect. This radiographic view may be useful in the diagnosis.

The important point is that foreign bodies should be suspected in patients with localized acute or chronic periodontitis that does not respond to treatment and may show one or more of the following signs and symptoms:

- Moderately painful
- Rapid onset of pocket exceeding 6 mm in depth
- Increased tooth mobility

- Extrusion

In such situations, it is recommended to perform periodontal exploration and surgical intervention, as soon as possible, to prevent further periodontal destruction.

References

1. Moyers RE. Orthodontic techniques. In: Moyers RE, ed. *Handbook of Orthodontics*. Chicago: Year Book;1988. p. 518
2. Dale JG. Interceptive Guidance of Occlusion with emphasis on diagnosis. In: Graber TM, Vanarsdall RL, eds. *Orthodontics Current Principles and Techniques*. St Louis: Mosby. 1994: 314.
3. Behrents RG. Iatrogenic problems associated with clinical practice of orthodontics. In: McNamara JA Jr, Trotman CA, eds. *Orthodontic Treatment: The Management of Unfavorable Sequelae*. Craniofacial Growth Series. Ann Arbor: University of Michigan; 1996. p. 12.
4. Zilberman I, Shteyer A, Azaz B. Iatrogenic exfoliation of teeth by the incorrect use of orthodontic elastic bands. *J Am Dent Assoc* 1976;93:89-93.
5. Waggoner WF, Ray KD. Bone loss in the permanent dentition as result of improper orthodontic elastic band use: a case report *Quintessence Int* 1989;20:653-6.
6. Rubel I. Avulsion of central incisors by elastic band with subsequent orthodontic treatment. *J Am Dent Assoc* 1980;100:211-2.
7. Caldwell CR, Worms FW, Gatto DJ. Orthodontic and surgical intervention to arrest tooth loss secondary to subgingival elastic. *J Orthod* 1980;78:273-8.
8. Vandersall DC, Varble DL. The missing orthodontic elastic band, a periodontic-orthodontic dilemma. *J Am Dent Assoc* 1978;97:661-3.
9. Vandersall DC. Localized periodontitis induced by rubber elastic. Report of a case. *J Am Dent Assoc* 1971;83:1326-8
10. McQuillen JH. Care in the use of Indian rubber rings [editorial]. *Dent Cosmos* 1870;12:429.
11. Haralabakis NB, Tsianou A, Nicolopoulos C. Surgical intervention to prevent exfoliation of central incisors from elastic wear. *J Clin Orthod* 2006; 40:51-4.
12. Zager NI, Barnett ML. Severe bone loss in a child initiated by multiple orthodontic rubber bands: case report. *J Periodontol* 1974;45:701-4.
13. St George G, Donachie MA. Case report: Orthodontic separators as periodontal ligatures in periodontal bone loss. *Eur J Prosthodont Restor Dent* 2002;10:97-9.
14. Huang WJ, Creath CJ. The midline diastema: a review of its etiology and treatment. *Pediatr Dent* 1995;17:171-9.
15. Lim KF. Latex elastic-induced periodontal damage: a case report on the subsequent orthodontic management. *Quintessence Int* 1996;27:685-90.
16. Olsen CB, Pollard AW. Severe bone loss caused by orthodontic rubber bands; management and nine-year follow-up: report of case. *ASDC J Dent Child* 1998;65:25-8.