

## Case Report

# Spontaneous Reversibility of an Iatrogenic Orthodontic Elastic Band-induced Localized Periodontitis Following Surgical Intervention – Case Report

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## Abstract

Orthodontic elastic bands are an important iatrogenic etiologic factor in the causation of periodontal attachment apparatus breakdown. Appropriate diagnosis and a well constructed treatment plan tailor-made to suit the requirements of the particular patient is imperative for management of periodontal lesions induced by subgingival retention of rubber band. There are conflicting reports regarding the reattachment and regeneration of lost periodontal supporting tissues in such cases. The present case report highlights the spontaneous reversal and correction of periodontal destruction due to iatrogenic orthodontic elastic band displacement deep into the subgingival tissues.

**Keywords:** corrective orthodontics, periodontitis, remission, spontaneous

## Introduction

Orthodontic elastic bands are non-metallic compounds of foreign body type (1), implicated in the production of localised periodontitis when inadvertently allowed to remain around teeth (2). Reports citing orthodontic elastic separators as a major iatrogenic cause for loss of periodontal bone support dates back to more than 127 years (3). Several cases have demonstrated the apical slippage of orthodontic elastic bands along the roots resulting in deep periodontal pockets, marked tooth mobility and severe bone loss, placing the teeth in serious jeopardy (2,4). The phenomena of gingival reattachment and possible regeneration are major issues in case of elastic band-induced periodontitis. A review of literature revealed a total of only five reports to date, concerning nine molars out of which five mandibular molars were treated, and only three of them showed promising results and superior periodontal health after treatment (2,3,5–7). The

duration of periodontitis ranged from 10 days to one year in all these cases (8).

This case report highlights the spontaneous correction of localised periodontitis involving a mandibular molar, initiated by inadvertent displacement of an orthodontic elastic band deep into the subgingival area.

## Case Report

A 20-year-old female patient reported to the Department of Periodontology and Oral Implantology with a chief complaint of swelling of gums in relation to the lower right back tooth region and associated dull, aching nature of pain in the same region since two days. A detailed case history was recorded. The dental history revealed that the patient had undergone oral prophylaxis and orthodontic therapy had been initiated one week back. The patient's orthodontist was

contacted and information was obtained regarding placement of orthodontic elastic band separators in relation to all the first molar regions. The medical and family history was non-contributory.

On clinical intraoral examination, the oral hygiene status of the patient was satisfactory with an oral hygiene score of 0.6 according to the oral hygiene index by Greene and Vermilion (9). A gingival swelling was detected on the gingiva over the lateral aspect of the root surface of the mandibular right first molar with an associated deep periodontal pocket of 8 mm on the disto-buccal aspect as measured using a William's graduated periodontal probe (Hu-Friedy, US). The six point probing depth recordings revealed a pocket depth of 5 mm on the midbuccal, distolingual aspects and 3 mm on the mesio-buccal, mid lingual and mesio-lingual aspects of the mandibular right first molar. The six point probing depths on the mandibular right second molar were 6 mm on the mesio-buccal aspect and 3 mm on the mid-buccal, disto-buccal, mesio-lingual, mid-lingual and disto-lingual aspects. The six-point pocket depth recordings of all the other teeth revealed a normal gingival sulcus depth of 2–3 mm. Purulent exudates and severe bleeding on probing was present in the region associated with the abscess with a Muhlemann and Son sulcus bleeding index (10) recordings of scores 2 and 1 for mandibular right first and second molars respectively. There was an absence of bleeding on probing around the remaining teeth. Vitality test provided negative result and confirmed the absence of pulpal involvement. The gingiva in all the other areas appeared clinically healthy with no detectable local deposits. Exploration of the deep pocket with an explorer (#23 Shepherd's Hook explorer, Hu-Friedy, US) failed to reveal the presence of subgingival calculus or foreign bodies. The orthodontic band was also missing in that region. The apical displacement of the orthodontic band deep into the subgingival area was suspected as a possible etiological factor for the abscess formation and associated pain in that localized region. Intraoral periapical radiographic evaluation of the mandibular right first and second molar region revealed horizontal bone loss extending up to the middle one third of the roots in the interdental area between the two teeth (Figure 1). Since the orthodontic bands are radiolucent, it was not discernible radiographically. A provisional diagnosis of iatrogenic orthodontic elastic band-induced periodontal abscess and localized periodontitis in relation to 46 was made.

Since, the elastic band lacked radiopacity and was not readily detectable with an explorer, the presence, although suspected, could not be proven without a surgical exploration. The procedure was explained in detail to the patient and a written informed consent was obtained from the patient.

Under 2% lignocaine hydrochloride local anaesthesia (LOX, Neon Laboratories LTD, Andheri, Mumbai, India) containing 1:200 000 adrenaline, incision and drainage of periodontal abscess was established and the patient was placed on an antibiotic and analgesic regimen of Amoxicillin 500 mg and diclofenac respectively, for 8 days. When the patient reported for the next appointment the following week, the periodontal abscess had completely subsided but the pain persisted in that region. In order to establish a definitive diagnosis and effectively treat the lesion, an access flap surgical procedure was decided upon.

The surgical site in the mandibular right quadrant was anesthetized by 2% lignocaine hydrochloride (LOX, Neon Laboratories LTD; Mumbai, IN) with 1:200 000 adrenaline. Using crevicular and interdental incisions a localized mucoperiosteal flap, extending from the distal aspect of mandibular right second premolar to the distal aspect of mandibular second molar region. A thorough debridement and curetting was performed and the elastic band was finally retrieved from the depth of the pocket, close to the alveolar bone (Figure 2). The area was irrigated with normal saline and carefully inspected to ensure complete removal of the foreign body and other irritants. Flap was sutured in position with interrupted sutures, using non-resorbable 3-0 silk (CENTENIAL Surgical Suture LTD, Thane, IN). Postoperative instructions were given and the patient was instructed in using chlorhexidine gluconate mouthrinse 0.12% (Peridex, Zila Pharmaceuticals, Phoenix, US).

One week post surgery, the suture removal was performed and the patient reported to be completely free of pain and discomfort. A clinical examination at this visit revealed a clinically healthy gingiva and an intraoral periapical radiograph obtained showed complete bone fill and restoration of the bone height to normal healthy levels (Figure 3). The patient was referred back to the Department of Orthodontics and Dentofacial Orthopedics for continuation of the necessary orthodontic treatment. The patient has been put on regular recall regime to review the gingival and periodontal health status.



**Figure 1:** Pre-operative intraoral periapical radiograph of the mandibular right first and second molar region showing horizontal bone loss extending up to middle one thirds of the roots of the teeth.



**Figure 2:** Surgical exposure of the elastic band retrieved from the depth of the pocket.



**Figure 3:** Post-operative intraoral periapical radiograph of the mandibular right first and second molar region showing complete bone fill and restoration of the bone height to normal healthy level.

## Discussion

The findings of previous studies have painted a mixed picture. According to one study, the the elastic band-induced periodontal lesion is not spontaneously reversible and complete regeneration of periodontal attachment apparatus is not probable (12). However, another study demonstrated the possibility of achieving complete regeneration of the lost bone upon removal of the offending foreign body (11). Also, another case report involving maxillary central incisors published that a complete reattachment was achieved in one week following treatment and removal of the apically displaced multiple orthodontic bands (8).

A literature search has revealed a total of 22 case reports to date, of periodontitis associated with accidental apical displacement of orthodontic elastic band over the past 127 years and the duration of periodontitis extended between 10 days to one year, hence confirming the possibility of spontaneous reversal of periodontal lesions (8,11). Compared to the case reports of occurrence of iatrogenic elastic band induced periodontal lesion in the anterior region, only a negligible number of cases have been reported of the similar conditions in the mandibular molar area, making this a rather rare occurrence. Also, in the past, various non-surgical as well as surgical treatment modalities have been attempted for the management of these lesions, however, the best treatment protocol is not yet found in the literature (8).

The radiolucency seen in the pre-operative radiograph can be confirmed to be the result of alveolar bone destruction in that region due to foreign body reaction and not mere presence of the displaced band as the orthodontic bands in all the cases reported till date were discernible radiographically (1–8). Only one case report identified the presence of orthodontic elastic band in the radiograph as the authors of that case reported that the band appeared as a radio-opaque, rectangular-shaped mass in the interproximal region indistinguishable from subgingival calculus (13).

## Conclusion

The results of the present study indicate that the lost alveolar bone can be completely regenerated within a short span of time, upon absolute removal of the aberrant foreign body and by adopting appropriate treatment modalities thus making the iatrogenic orthodontic elastic

band-induced localized periodontitis lesion a spontaneously reversible one. Locating orthodontic elastic bands that have been displaced deep into the supporting periodontal tissues can be an arduous task. Attention to detail, careful monitoring, discriminate use and patient education are the best deterrents to damage caused by orthodontic elastics (4). The development and manufacture of orthodontic elastics that are radiopaque would definitely minimize the incidence and severity of such cases.

## Authors' Contribution

Conception and design, drafting of the article, critical revision of the article for important intellectual content, final approval of the article, and collection and assembly of data: NS

Conception and design, analysis and interpretation of the data, drafting of the article, final approval of the article, and obtaining of funding: NSK

Critical revision of the article for important intellectual content, provision of study materials or patients, and administrative, technical, or logistic support: KKK

Critical revision of the article for important intellectual content, administrative, technical, or logistic support, and collection and assembly of data: GVR, SKD

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