Periodontal tissue destruction caused by an elastic orthodontic spacer; a case report

Dannan A
Department of Periodontology, Faculty of Dental Medicine, Witten/Herdecke University, Witten, Germany.

Email: aousdannan@yahoo.com

Abstract

The cooperation between the dentist and the patient is considered to be an important factor in every successful dental treatment, especially in orthodontic treatments in which routine visits are parts of the whole treatment plan. Once this cooperation is lost, possible negative effects may be the consequence. Since the periodontal tissues are mostly affected during orthodontic treatment, resulting in periodontal tissue destruction, it is highly recommended that the patient keeps visiting his/her orthodontist frequently, whether or not he/she will continue the treatment. This case report demonstrates possible features of local periodontal tissue destruction caused by an impacted orthodontic spacer which was noted – or had been ignored – by the patient during a past orthodontic treatment. The poor cooperation between the patient and the orthodontist has been considered the reason for the periodontal tissue destruction in this case. Clinicians should be highly suspicious of any periodontal abnormality that arises when elastic orthodontic spacers are being used in the mouth.

Keywords: Open-flap curettage, Orthodontic spacer, Periodontal destruction

Introduction

Several previous studies reported that gingivitis, periodontitis and other periodontal complications had been noted during and / or after some orthodontic treatments . However, the establishment of very good oral hygiene in patients undergoing orthodontic treatment can always prevent, or at least reduce, any orthodontic negative effects on the soft and hard periodontal tissues .
Spacers, braces, brackets and wires are all basic elements which are used during most of ordinary orthodontic treatments. The following case describes the clinical treatment of orthodontic elastic spacer-induced periodontitis and the treatment results. This case serves as a valuable reminder of the potential dangers of such orthodontic elements.

Case report

A 22-year-old woman was referred to the Department of Periodontology at the Faculty of Dental Medicine in Damascus because of localized pain and bleeding associated with teeth #12 and #11 **(Figure 1).** The patient was in good general condition and had no relevant medical complaint. The clinical intra-oral examination revealed 6mm and 7mm probing depths on teeth #12 (mesially) and #11 (distally) respectively with 2mm gingival recession on the facial side of tooth#11. Tooth #12 was restored with ceramic crown. Grade (I) mobility was associated with the affected teeth. In general, the patient's oral hygiene was good. For some technical reasons, no x-ray examination could be achieved.
The treatment plan consisted of a complete conservative periodontal treatment, local surgical intervention by means of open-flap curettage in the area extended from tooth #13 to tooth #23 labially and lingually, removal of the granulation tissues in situ and postoperative care with antibiotic coverage.

Figure 1. The initial intra-oral situation of the patient

The first phase of treatment was commenced with a complete sub- and supragingival scaling and root planing which was performed in two visits with 7-day interval by means of hand instruments as well as sonic scaler device. Moreover, the patient was educated about oral hygiene instructions during the whole period of treatment. One week later, a reevaluation of the patient's oral hygiene situation has been performed. At this level, the patient showed a very good ability to keep her oral hygiene at high level and accepted for any possible surgical intervention.
The second phase was initiated one week later and

consisted of an open-flap periodontal surgery. In this phase, the incisor area affected was accessed by labial full-thickness mucoperiosteal flap reflection using intrasulcular incisions **(Figure 2).** The root surfaces were completely exposed in order to have an access to the bone defects. After flap exposure, a foreign 10mm-elastic semi-lunar body was noted in the area between the teeth #12 and #11 on the labial side **(Figure 3)**. The foreign body was completely removed revealing a deep intrabony defect in the same area **(Figures 4 and 5).**

By means of hand instruments and surgical ultrasonic device, deep scaling and root planing was performed and the granulation tissues were completely removed from the intrabony defects **(Figure 6).** A complete suturing to obtain a full coverage of the surgical area was performed **(Figure 7).** In order to prevent any possible postoperative wound infection, a dose of Amoxicillin (500mg) (4 times/day) and Metronidazol (250mg) (3 times/day) was described to the patient for a whole period of 10 days. The sutures were removed after 10 days and the patient was set to reevaluation follow-up visits (Figure 8). Examination of the foreign body removed from the surgical site revealed an elastic orthodontic spacer usually used in orthodontic treatment.

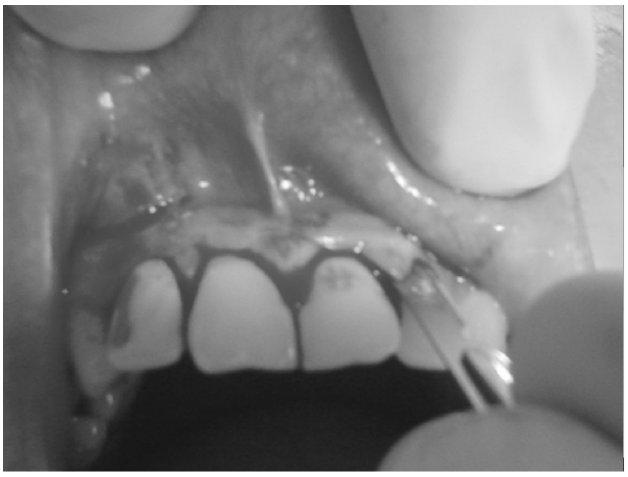
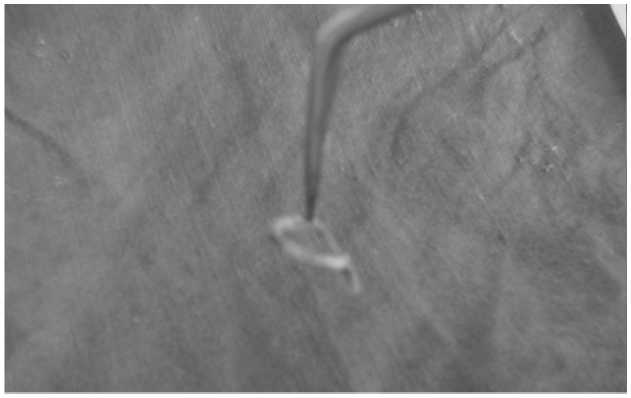


Figure 2. Labial full-thickness mucoperiosteal flap reflection

Fig.3: Exposure of the defected area showing an elastic orthodontic spacer impacted in situ



4. Total removal of the orthodontic spacer

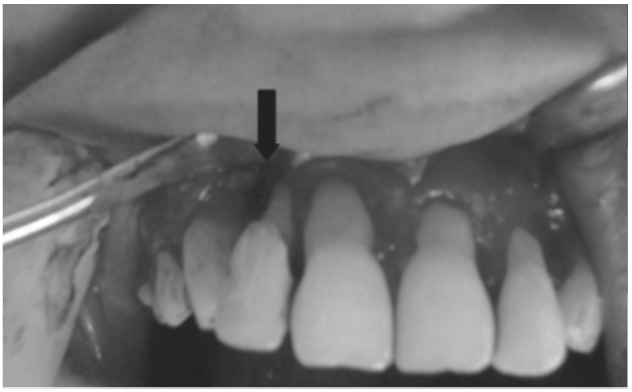


Figure 5. A deep intra-bony defect was associated with the existence of the local irritating factor (black arrow)

Figure 6. The situation after a deep scaling and root planing and a total removal of the granulation tissues from the intrabony defect

Figure7. After completing the sutures

Figure 8. Situation after 10 days

Discussion

This case report demonstrates common features of periodontal tissue destruction accompanied by local irritating factors. In this case, the factor that caused the tissue damage was an orthodontic element which is routinely used in any normal orthodontic treatment, namely an orthodontic spacer.

Orthodontic spacers are used in orthodontics before braces are applied on teeth, and are applied on the molars at the second orthodontic appointment. Spacers are circular rubber bands about a centimeter in diameter placed between upper and lower molars; there may be 1-12 spacers applied. The spacers stay between the teeth for about two weeks and move the teeth apart slowly until there is enough space for fitting a tooth brace. Spacers are worn until the orthodontist removes them or if they are removed accidentally by the patient.

Periodontal destruction due to subgingival elastic bands was first reported in the dental literature nearly 130 years ago, and has involved over 20 cases. Destruction due to orthodontic separators used during fixed appliance therapy is a less common occurrence.

In 1998, Olsen and Pollard[9] reported the early diagnosis and treatment of an iatrogenic acute localized periodontitis arising from the incorrect use of orthodontic elastic rubber bands to close a maxillary midline diastema in an eight-year-old girl. The case illustrated the misdiagnosis and mismanagement of a transitional diastema in the "ugly duckling" stage of the mixed dentition. The nine-year follow-up showed that thorough periodontal and orthodontic management has allowed successful retention of both maxillary permanent central incisors, which had initial pathological grade 3 vertical mobility, little remaining alveolar bone, and a hopeless prognosis.

St George and Donachie presented a case report in 2002 which illustrated severe periodontal destruction which can occur when separators are misused [10]. In this report, emphasis was placed on the correct use of these orthodontic adjuncts and, appropriate monitoring of the gingival health of orthodontic patients.

In this case, at the completion of the periodontal treatment, the patient declared that she had been to an orthodontist to seek correction of tooth position one year previously. However, the patient did not keep the appointments given by her orthodontist and did not complete the treatment. In such cases, it is always the responsibility of the patient to follow the instructions of the orthodontist whether or not he/she will be able to continue the treatment. At this level, deep cooperation between the patient and the dentist is always a must. Although orthodontic spacers are usually used in posterior teeth areas (i.e. the molar areas), it was not clear why they have been applied between the incisors in this case.

Considering that the postoperative intra-oral situation of the patient in this case was not accepted in the long run, the future plan was a mucogingival correction of the periodontal defect with suitable bone graft.

It appears that dental elements which are used in orthodontic treatments could be local risk factors for periodontal tissue destruction. However, orthodontists as well as periodontists should be aware of the intra-oral complications associated with such dental elements and therefore further educate their patients about the importance of cooperation with their dentist.

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