



Management of gingival enlargement induced by fixed orthodontic treatment: A case series

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Article Info

ISSN (online): 2582-8940

Volume: 03

Issue: 02

April-June 2022

Received: 15-04-2022;

Accepted: 30-04-2022

Page No: 22-26

Abstract

Gingival enlargement is one in all the foremost most common sequelae of fixed orthodontic treatment because of retention of plaque which further results in gingival inflammation, as well as nickel ions present in appliances, which could even be the causative factor of gingival overgrowth as nickel ions favor fibroblastic proliferation. This further results in speech, mastication, esthetic and psychological problems. Gingival overgrowth is corrected by nonsurgical periodontal therapy or sometimes it resolves by itself after the removal of braces. If gingival enlargement persists, surgical therapy is planned. Gingivectomy followed by gingivoplasty is the surgical technique preferred. Monthly periodic dental checkups and patient motivation to maintain oral hygiene are the key to success in the treatment of gingival enlargement induced by fixed orthodontic treatment.

Keywords: Gingival enlargement, gingivectomy, fixed orthodontic treatment

Introduction

Gingival overgrowth is one of the foremost common complications associated with fixed treatment. Patients with fixed orthodontic appliances are more at risk of gingival overgrowth due to excessive plaque accumulation and bacterial colonization around the braces ^[1]. Mechanical irritation through bands, chemical irritation by cement, food accumulation, and inadequate oral hygiene care are a number of causative factors resulting in gingival enlargement in patients with fixed appliances ^[2]. Holmstrup & Vanarsdall mentioned that inflammatory gingival enlargement is taken into account as a kind 4 hypersensitivity and is manifested as nickel allergic contact stomatitis ^[9]. Complete elimination of causative factors is requisite for the healing process of gingival tissues. Preliminarily, non-surgical periodontal therapy like scaling is planned and oral hygiene instructions are given. If the gingival overgrowth resolves by non-surgical therapy there is no further need for surgical therapy but if the persistent gingival enlargement hinders the esthetic and functional appearance and jeopardizes orthodontic tooth movement, there is a necessity for surgical technique ^[8].

The surgical technique includes Gingivectomy along with gingivoplasty to revive the contours of the gingival margin. Gingivectomy procedure may be done through conventional scalpels, electrosurgery, chemosurgery, and laser. Scalpel is the commonest technique performed because it is accurate and causes minimal damage to the tissue but it doesn't provide hemostasis whereas Lasers provide superior hemostasis, less postoperative discomfort, and pain, decreased chances of infection, and immediate coagulation effect ^[3, 5, 6].

The point of interest of this case series is to emphasize the importance of diagnosis, management, and motivation of the patient undergoing orthodontic treatment.

Case series

Case 1

A 21-year-old female patient reported to the Department of Periodontology, KD Dental College and Hospital Mathura, India with complaints of swelling of the upper and lower gums for 6-7 months.

She also complained of bleeding from the gums while brushing, unable to close the mouth due to bulkiness inside, and bad breath. Orthodontic treatment was started 3 years before for proclination of teeth and therefore the patient was on retainers for six months. There was no other relevant medical, dental, or family history. On clinical examination, oral hygiene status was poor. Marginal and papillary gingiva appeared reddish and enlarged in the maxillary and mandibular arches. Further soft tissue assessment revealed soft and edematous consistency and bleeding on probing was present.

A treatment plan consisting of initial periodontal therapy followed by a gingivectomy procedure to improve aesthetics and function was formulated. The initial periodontal therapy comprising supragingival and subgingival scaling was performed after removing the retainers. Oral hygiene instructions were given and the use of chlorhexidine mouthwash twice every day for one week was advised. On the following visit, the gingival enlargement failed to show a considerable reduction in size, but some of the areas appeared to be firm in consistency. Routine blood investigations (Bleeding time, Clotting time, Hemoglobin, ESR, Total Leucocyte Count, and Differential Count) were carried out and the results were non-contributory. Gingivectomy by electrosurgery was planned within the maxillary and mandibular anterior sextant, and further gingival contouring was done with a scalpel.

Procedure

After giving local anesthesia, A blended cutting and coagulating (fully rectified) current were used. The electrode was activated and moved in an exceedingly concise "shaving" motion to remove the bulk and Kirkland and orbans interdental knives were used for gingival contouring. Coe pack was placed as a periodontal dressing for 1 week. After 1 week the patient was recalled for coe pack removal. After two weeks the patient was comfortable and the areas were healed.



Preoperative



Follow up after 2 weeks



Postoperative 1



Postoperative 2

Case 2

A 17 year-old male patient referred from the department of orthodontics reported to the Department of Periodontology, KD Dental College and Hospital Mathura, India with complaints of swelling as well as bleeding from lower gums for 6-7 months. Orthodontic treatment was started 2 years before for malalignment of teeth. There was no other relevant medical, dental, or family history. The patient wasn't medically compromised or taking medications that may cause drug-associated gingival enlargement.

On clinical examination, oral hygiene status was poor. Marginal and papillary gingiva appear pink and enlarged in a mandibular anterior arch. Marginal gingiva was impinging on the brackets and gingiva has grown nearly half of the crown. Further soft tissue assessment revealed soft but fibrotic consistency and bleeding on probing was present.

A treatment plan consisting of initial periodontal therapy followed by a gingivectomy procedure to improve aesthetics and function was formulated. After removing the archwire, the initial periodontal therapy comprising supragingival and subgingival scaling was performed. Oral hygiene instructions were given and the use of chlorhexidine mouthwash twice a day for one week was advised. On the subsequent visit, the gingival enlargement failed to show a substantial reduction in size, but some of the areas were perceived to be firm inconsistency. Routine blood investigations (Bleeding time, Clotting time, Hemoglobin, ESR, Total Leucocyte Count, and Differential Count) were carried out and the results were non-contributory. Clinical examination and investigations confirmed the diagnosis of chronic inflammatory gingival enlargement. The patient has advised diode laser gingivectomy (980 nm) as an adjunct to nonsurgical periodontal treatment on sites with gingival enlargement.

Procedure

The diode laser gingivectomy was performed under topical

lignocaine anesthetic gel and applied for 3 minutes before operation. The gingivectomy was performed with gentle, sweeping brush strokes with a power output of 1.2 W, continuous wave (CW) using the laser fiber tip (400 µm in diameter). Gingivoplasty on the labial side of lower anterior teeth was carried out. This procedure was done until the required architecture of marginal gingival was achieved. Patients were given postoperative instructions. For pain control, analgesics were prescribed to the patient if needed. The patient was followed up after 1, and 3 weeks postoperatively. It had been found that there was no bleeding immediately postoperatively or within the follow-up period. The patient did not require any analgesia in the postoperative period. But wound healing was slightly delayed. The patient was recalled every month for a check-up, and no regrowth was noticed. Healing was satisfactory.



Preoperative



Laser application



Postoperative



Follow-up after 1 week

Case 3

A 20-year-old female patient reported to the Department of Periodontology, KD Dental College and Hospital Mathura, India with complaints of swelling of the upper and lower gums for 6-7 months. She also complained of bleeding from the gums while brushing, unable to close the mouth due to bulkiness inside, and bad breath. The patient was undergoing fixed orthodontic appliance therapy that had received ongoing nonsurgical periodontal treatment and instructions on oral hygiene but had persistent gingival enlargement. The patient wasn't medically compromised or taking medications that may cause drug-associated gingival enlargement. On clinical examination, oral hygiene status was poor. Marginal and papillary gingiva appear enlarged on the labial and buccal sides within the maxillary and mandibular arches. Marginal gingiva was impinging on the brackets and molar bands and gingiva has grown nearly half of the crown. Further soft tissue assessment revealed soft and edematous consistency and bleeding on probing was present.

A treatment plan consisting of phase I periodontal therapy followed by a gingivectomy procedure to enhance aesthetics and function was planned. Oral hygiene instructions were given and the use of chlorhexidine mouthwash twice on a daily basis for one week was advised. On the subsequent visit, the gingival enlargement did not show a considerable reduction in size, but some of the areas appeared to be firm in consistency. Routine blood investigations were carried out and the results were non-contributory. Gingivectomy by electrosurgery was planned in the maxillary and mandibular anterior sextant, The electrode was activated and moved in a concise "shaving" motion to remove the bulk. In other areas after marking the pockets using a pocket marker or scalpel gingivectomy was performed. Coe pack was placed as a periodontal dressing for 1 week. After 1 week the patient was recalled for coe pack removal the patient was recalled after two weeks. The patient was comfortable and the healing was satisfactory.



Preoperative 1



Preoperative 2



Preoperative 3



Postoperative 1



Postoperative 2



Postoperative 3



Follow up after 2 weeks

Case 4

A 21 year-old male patient referred from the department of orthodontics reported to the Department of Periodontology, KD Dental College and Hospital Mathura, India with complaints of swelling as well as bleeding from lower gums

for 6months. Orthodontic treatment was started 3 years before for spacing between the teeth within the front region of the jaw. There was no other relevant medical, dental, or family history. The patient was not medically compromised or taking medications that may cause drug-associated gingival enlargement.

On clinical examination, oral hygiene status was poor. Marginal and papillary gingiva appear pink and enlarged in a mandibular anterior arch. Marginal gingiva encroaching toward the orthodontic brackets and gingiva has grown nearly half of the crown. The gingiva, in general, was firm in consistency with loss of contour. Further soft tissue assessment revealed soft but fibrotic consistency and bleeding on probing was present.

A treatment plan including phase I therapy followed by a gingivectomy procedure to improve aesthetics and function was formulated. After removing the archwire, supragingival and subgingival scaling was performed. Oral hygiene instructions were given and the use of chlorhexidine mouthwash twice a day for one week was advised. On the next visit, the gingival enlargement didn't show a substantial reduction in size, but some of the areas appeared to be firm inconsistency. Routine blood investigations were done. Clinical examination and investigations confirmed the diagnosis of chronic inflammatory gingival enlargement. The patient has advised diode laser gingivectomy (980 nm) as an adjunct to nonsurgical periodontal treatment on sites with gingival enlargement. The same procedure was done as in case 2. After 2 weeks, the follow-up revealed that there was good clinical crown exposure and postoperatively, the results were satisfactory.



Preoperative



Postoperative



Follow up after 2 weeks

Discussion

Genelhu *et al* and Kouraki *et al* observed that gingival enlargement is one of the most common sequelae of orthodontic treatment than other manifestations. Gingival enlargement can be seen within 1- 2 months after the fixation of orthodontic appliances. Accumulation of plaque is the main causative factor causing gingival inflammation during fixed treatment that further ends up in gingival overgrowth. Sometimes the gingival overgrowth regresses after the removal of the braces but this was contraindicated by Ramadan as he concluded that even after the removal of orthodontic appliances, resolution may not be complete.¹⁰

If there is a fibrotic gingival overgrowth or to maintain gingival health during prolonged orthodontic treatment surgical therapy as an adjunct to nonsurgical therapy is indicated.

Surgical therapy includes the combination of gingivectomy together with the gingivoplasty procedure. Several studies evaluated the effectiveness of gingivectomy as an adjunct to nonsurgical periodontal therapy within the management of GE during orthodontic treatment and have also shown favorable results with the adjunct use of both scalpel gingivectomy and laser gingivectomy^[1].

Gingivectomy are often performed with a conventional scalpel, chemosurgery, electrosurgery, or laser device. Lasers in orthodontic patients have the advantage of reduced treatment time and reduced chances of infection with minimal pain and discomfort for the patients^[3]. Electrosurgery is used for cutting or coagulating soft tissues. It provides the advantage of adequate contouring of the tissue, hemostasis, and less postoperative pain after the procedure^[7]. In the above-mentioned cases teeth where orthodontic brackets were not removed for the periodontal treatment, scalpel gingivectomy was performed in all other areas. The follow-up showed that there was good clinical crown exposure and postoperatively, the results were satisfactory.

Therefore, to avoid such consequences and restore the gingival health patient motivation regarding oral hygiene and periodic periodontal maintenance care during the orthodontic therapy should be done.

Conclusion

Gingival enlargement is the most common consequence in patients, undergoing orthodontic treatment. It is mandatory to evaluate the gingival and periodontal status. At the initial stages of orthodontic treatment, the patient should be motivated with proper oral hygiene education. Clinicians should also be able to assess the oral hygiene regime of patients before and during orthodontic therapy. Proper identification and elimination of etiologic factors and proper maintenance are required for successful treatment of gingival enlargement. Periodic periodontal maintenance care during orthodontic therapy would definitely avoid such consequences and preserve the gingival health.

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