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Case Report

Beyond the screw: Exploring the recurrence of oral lesions

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ABSTRACT

The integration of skeletal anchorage systems has revolutionized orthodontics, especially with the advent of mini-screws known for their ease of use and minimal invasiveness. The mandibular buccal shelf area, with its ample high-quality bone and low failure rates, has become a preferred extra-alveolar anchorage site. However, complications involving adjacent soft tissues are common with orthodontic bone screw placement. This case report describes the recurrence of reactive oral lesions following placement of orthodontic bone screws in the buccal shelf area. During the course of orthodontic therapy, the patient developed exophytic growths twice, at the same site, on the lower right back buccal mucosa. Diode laser was used in both instances for excision of the lesion and the specimen was sent for histo-pathological analysis. The first lesion was diagnosed as inflammatory fibrous hyperplasia, while the recurrent lesion was identified as pyogenic granuloma. At 12-months follow-up, no new lesions were detected. This report highlights the influence of lesion development time on its clinical and histological presentation. It is postulated that leaving the bone screw in place after initial biopsy could have contributed to its recurrence. Complete excision is the preferred treatment. Treatment options, including laser therapy, are available for such lesions.

1. Introduction

Orthodontic bone screws (OBS), renowned for their ease of use and minimal invasiveness, have revolutionized dentofacial-orthodontics. Extra-alveolar sites, including buccal shelf area (BSA), infrazygomatic crest area, mandibular ramus and nasal spine, are common for OBS placement.[1] The mandibular BSA, characterized by abundant high quality bone, offers biomechanical advantages and lower failure rates. Distal to mandibular second molar has emerged as the preferred site for OBS placement in the BSA.[2] OBS-placement represents a well-documented safe therapeutic intervention; nevertheless, it is not devoid of potential complications.[3] The oral mucosa is subject to a multitude of internal and external stimuli, giving rise to various reactive lesions. These lesions develop in response to chronic inflammation induced by recurrent tissue injury stemming from sustained exposure to low-grade irritants.[4] OBS can incite reactive tissue growth, particularly when inserted through non-keratinised or mobile gingival tissues.[3] Following case presents 1-year follow up of a patient having recurrent mucosal lesions secondary to OBS placed in the BSA. The first lesion was diagnosed as inflammatory fibrous hyperplasia (IFH) and the recurrent lesion as pyogenic granuloma (PG).

2. Case Presentation

A 21-year old male, undergoing fixed orthodontic therapy for past 1-year, reported with the chief complaint of cheek

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bite and minor discomfort in chewing, in relation to the lower right back region. A soft tissue overgrowth was present at the site, which he had noticed 6-months before reporting to the department. The lesion was asymptomatic with a gradual increase in size. No relevant dental or medical history was reported. On examination, there was a soft-tissue overgrowth (9mm x 7mm) in the right, lower back buccal mucosa. It was pale pink in colour, fibrous and pedunculated with well-defined margins. The radiograph revealed no bone involvement concerning the screw (Figure 1a,b). Post-obtaining consent, excisional biopsy was done using Biolase diode laser (940nm wavelength, 0.9W power, continuous mode), followed by saline irrigation. Histological analysis revealed epithelium to be stratified squamous parakeretanised, hyperplastic in few areas and atrophic in other areas (Figure 2). The underlying connective tissue was found to be myxomatous and fibrovascular consisting of blood capillaries filled with red blood cells, abundant fibroblasts along with mixed inflammatory cells. The lesion was diagnosed as IFH. No lesion recurrence was observed after 45-days (Figure 3a). After 7-months, at the time of debonding, the patient reported back with a new soft-tissue overgrowth, covering the OBS head. The lesion (8mm x 4mm x 2mm) was soft, hemorrhagic and erythematous, with well-defined margins (Figure 3b). Biopsy was done using same protocol. Histological analysis revealed cell clusters, engorged capillaries and hyperplastic epithelium. The underlying connective tissue showed abundant neutrophils, blood vessels, plasma cells, lymphocytes, and macrophages in a myxoid background. The lesion was diagnosed as PG (Figure 4). The site showed satisfactory healing 1-week post-excision. At 1-year follow-up no new lesions were observed.

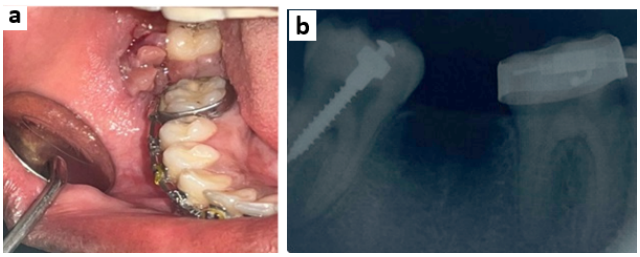

Figure 1: a): Tissue overgrowth in the right lower back buccal mucosa; **b):** Radiograph showing orthodontic bone screw placed in relation to 48.

3. Discussion

This case report delineates a recurring tissue overgrowth in the buccal mucosa, manifested during the course of fixed orthodontic treatment involving inter-radicular OBS placement. The insertion of OBS can stimulate adjacent soft tissues, leading to tissue overgrowth, minor infections

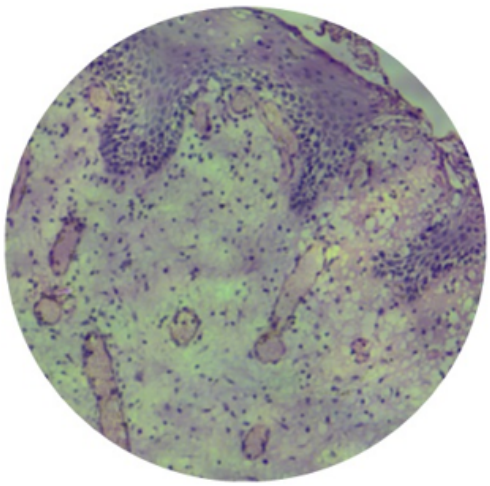

Figure 2: Histological picture of the first lesion diagnosed as inflammatory fibrous hyperplasia (Stain -hematoxylin & eosin; Magnification - 10x)

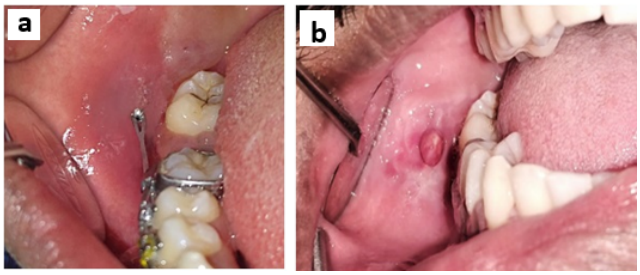

Figure 3: a): Healed site post-45-days of excision; **b):** Recurrent tissue over growth at the same site, 7 months later.

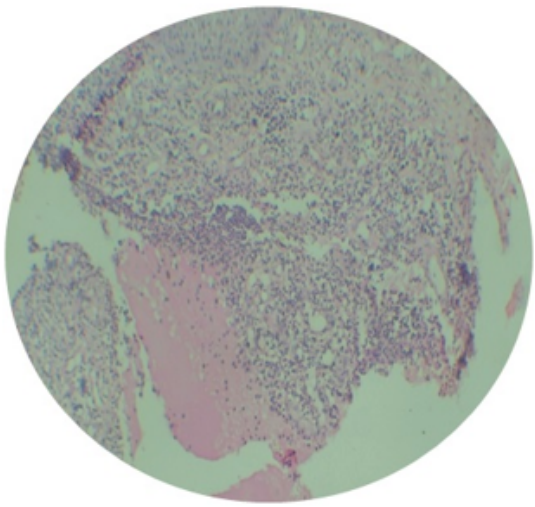

Figure 4: Histological picture of the recurrent lesion diagnosed as pyogenic granuloma (Stain -hematoxylin & eosin; Magnification - 4x)

and peri-screw inflammation. Tissue overgrowth is defined as the partial or complete coverage of OBS head by surrounding soft tissues.[3] Attached gingiva is safest for OBS placement, as chances of mucosa getting irritated and, further, inflamed is greatly reduced. Given that many patients exhibit minimal width of attached gingiva buccal to the molars, over 75% of optimally positioned OBS may penetrate the movable mucosal tissue.[1,3,5] Thus, OBS can be positioned within the movable mucosa, after adequate soft tissue clearance. The elevated placement of OBS head is crucial in effectively maintaining screws within movable mucosa and facilitating oral hygiene practices.[5]

Orthodontically-induced tissue overgrowths, transient in nature, resolve upon completion of therapy.[3] Intervention may become necessary if patient expresses discomfort or if the growth interferes with treatment progress. Although these lesions are benign, they tend to recur if not completely excised or if the irritant is not eliminated. Presentation and, thus, the diagnosis of these overgrowths primarily relies on the aggressiveness and duration of the lesion, although treatment approaches remain consistent.[6] In the present case, the initial diagnosis, approximately 18-months post-OBS placement, was IFH and the recurrent lesion got diagnosed as PG. This underscores the influence of time taken for development of lesion on its clinical and histological presentation. It can, also, be speculated that since OBS was not removed post-biopsy, it led to recurrence of the lesion.

Reactive oral lesions, posing clinical resemblance, can be challenging to diagnose. Histologically, these lesions exhibit diverse features, reflecting the various ways connective tissue reacts to different levels of stimuli. Within the stromal environment, inflammatory, angiogenic and fibrotic components work together to dictate the histopathological diagnosis. Throughout the development of any lesion, proportions of these components vary. PG, for instance, present highly vascularised, loose connective tissue, while fibrous lesions feature densely packed, well-organised connective tissue.[6,7] PG featuring severe inflammation, compared to IFH, damages extracellular matrix, leading to vasodilation, increased vascular permeability, hyperplasia, neovascularisation, and eventually fibroblastic proliferation.[7] Interestingly, vascular lesions like PG may evolve into fibrous lesions in later stages. Presentation of IFH depends on vascularity, collagenisation, and inflammation; fibroblast population vary widely, ranging from sparse and unremarkable to fine spindle-shaped cells.[7,8]

There is currently no universally accepted standard of care for managing these lesions. Different treatment modalities exhibit varying degrees of efficacy and recurrence rates. Complete excision is preferred, with medical management generally not recommended.[9] In the present case, 940nm diode laser was preferred because of their minimal thermal impact on the depth of treated tissue. This helped preserving biopsy specimens, thereby facilitating better evaluation. Laser surgery offers several benefits including local sterile environment, precise incisions, excellent hemostasis, reduced intra- and post-operative pain and better healing process.[10]

4. Conclusion

Health of the surrounding soft tissues significantly influence screw stability. The presentation and subsequent diagnosis of the soft-tissue overgrowth depends on the lesion's duration and the nature of injury it has sustained. Soft-tissue lesions can be managed with laser therapy. Comprehensive analysis can yield insights for personalized follow-up care, and also prevent recurrence.

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6. Conflict of Interest

None declared.

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References

1. Chang C, Lin JSY, Yeh HY. Extra-Alveolar Bone Screws for Conservative Correction of Severe Malocclusion Without Extractions or Orthognathic Surgery. *Curr Osteoporos Rep*. 2018;16(4):387–94.
2. Athira VM, Shashidhar K, Kuttappa MN, Nayak UK, Ravi MS, D'Souza N, et al. Safe sites for buccal shelf bone screw placement in various skeletal malocclusions: A CBCT study. *J Orthod Sci*. 2023;12:63. doi:10.4103/jos.jos_13_23.
3. Giudice AL, Rustico L, Longo M, Oteri G, Papadopoulos MA, Nucera R, et al. Complications reported with the use of orthodontic miniscrews: A systematic review. *Korean J Orthod*. 2021;51(3):199–216.
4. Ossa YF, Ulfah K, Sitinjak RR. Treatment of traumatic ulcer induced by fixed orthodontic appliance: A case report. *J Syiah Kuala Dent Soc*. 2022;7(1):69–72.
5. Chang C, Liu SS, Roberts WE. Primary failure rate for 1680 extra-alveolar mandibular buccal shelf mini-screws placed in movable mucosa or attached gingiva. *Angle Orthod*. 2015;85(6):905–10.
6. Babu B, Hallikeri K. Reactive lesions of oral cavity: A retrospective study of 659 cases. *J Indian Soc Periodontol*. 2017;24(4):258–63.
7. Vasanthi V, Divya B, Ramadoss R, Deena P, Annasamy RK, Rajkumar K, et al. Quantification of inflammatory, angiogenic, and fibrous components of reactive oral lesions with an insight into the pathogenesis. *J Oral Maxillofac Pathol*. 2022;26(4):600. doi:10.4103/jomfp.jomfp_138_21.
8. Lalremtluangi R, Dangore-Khasbage S. Reactionary Bone Changes in Long-Standing Pyogenic Granuloma: A Case Report. *Cureus*.

2024;16(1):e53021. doi:10.7759/cureus.53021.
9. Sarwal P, Lapumnuaypol K. Pyogenic Granuloma. and others, editor. StatPearls. Treasure Island (FL): StatPearls Publishing; 2022.
10. Andreadis D, Lazaridi I, Anagnostou E, Poulopoulos A, Panta P, Patil S, et al. Diode laser assisted excision of a gingival pyogenic granuloma: A case report. *Clin Pract*. 2019;9(3):1179. doi:10.4081/cp.2019.1179.

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