POST ORTHODONTIC RETENTIVE ESTHETIC MEASURES OF PERIODONTIUM- A REVIEW

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INTRODUCTION
Aesthetic concerns have led to an increasing importance in seeking dental treatment, with the purpose of achieving perfect smile. Specific areas reviewed are how periodontal tissue reacts to orthodontic forces, influence of tooth movement on the periodontium, effect of circumferential supracrestal fiberotomy in preventing orthodontic relapse, effect of orthodontic bands on the periodontium, mucogingival considerations and time relationship between orthodontic and periodontal therapy. In addition to this, the maxillary frenum may present aesthetic problems or compromise the orthodontic result in the midline diastema cases, thus causing a recurrence after the treatment.
FRENECTOMY

The continuing presence of a diastema between the maxillary central incisors in adults, has often been considered as an aesthetic problem. The presence of an aberrant frenum being one of the aetiological factors for the persistence of a midline diastema which necessitates the removal of aberrant frenal attachment.

CLASSIFICATION

The labial frenal attachments have been classified as mucosal, gingival, papillary and papilla penetrating, by Placek et al (1974) 1.

- Mucosal – when the frenal fibres are attached up to the mucogingival junction.
- Gingival – when the fibres are inserted within the attached gingiva.
- Papillary – when the fibres are extending into the interdental papilla.
- Papilla penetrating – when the frenal fibres cross the alveolar process and extend up to the palatine papilla.

INDICATIONS

The frenum is characterized as pathogenic and is indicated for removal when

- An aberrant frenal attachment is present, which causes a midline diastema.
- A flattened papilla with the frenum closely attached to the gingival margin is present, which causes a gingival recession and a hindrance in maintaining the oral hygiene.
- An aberrant frenum with an inadequately attached gingiva and a shallow vestibule is seen.

TREATMENT

The aberrant frena can be treated by frenectomy or by frenotomy procedures. Frenectomy is the complete removal of the frenum, including its attachment to the underlying bone, while frenotomy is the incision and the relocation of the frenal attachment1. The conventional technique involves excision of the frenum by using a scalpel. However, it results with routine postoperative complications like bleeding and patient compliance.

The electrocautery can also be used due to its efficacy and safety of the procedure, the mild bleeding and the absence of postoperative complications. However, it is associated with certain complications like burns, the risk of an explosion if combustible gases are used, interference with pacemakers and the production of surgical smoke. These complications have not been reported with the new improvement in the electro surgical techniques, like the Argon Beam Coagulation (ABC)2,3.

Recently, the use of a CO2 laser in frenectomy procedures has been reported as a safe and effective procedure with the advantages of a shorter duration of the surgery, simplicity of the procedure, the absence of postoperative infections, lesser pain, swelling and the presence of a small or no scar2. A delayed healing as compared to that in the conventional scalpel techniques, a reduced surgical precision resulting in an inadvertent laser-induced thermal necrosis and/or a photo acoustic injury, are some of the complications associated with lasers. The application of diode and Er:YAG lasers in labial frenectomies in infants and Er,Cr:YSGG lasers 5 in labial frenectomies in the adolescent and the pre-pubescent populations have also been reported.

FIBEROTOMY:

A fiberotomy or pericision is an orthodontic surgical procedure designed to sever the gingival fibers around a tooth. It usually reduces the tendency to relapse of tooth rotations corrected by dental braces or other treatments. The most frequently encountered post-orthodontic problem is the retention of re-established tooth position. Relapse may occur anywhere, but it is often associated with teeth that have undergone rotation as part of the orthodontic therapy.

A fiberotomy involves the detachment of the fibers that attach the tooth to the bone to release the tension between the fibers and the tooth reduces the forces that attempt to relapse. It is performed near the completion of the orthodontics and is shown to be effective in preventing the relapse of teeth. This procedure is performed with scalpel as simple procedure to sever the fiber attachment around the tooth and is usually painless simple procedure.

Laser CSF is an effective procedure to decrease relapse after tooth rotation, causing no apparent damage to the supporting periodontal structures, whereas LLLT on orthodontically rotated teeth without retainers appears to increase the relapse
tendency

CROWN LENGTHENING:

Gingival Augmentation:

Gingival or soft tissue recessions are defined as the displacement of the marginal tissue apical to the cemento-enamel junction and can affect the labial, lingual & or interproximallareas .The aetiology is incompletely understood and thought to be multifatorial in nature, with both predisposing and precipitating factors implicated. The former constitute anatomic and morphological characteristics, such as alveolar bone dehiscence, thin buccal mucosa, crowding, presence of aberrant frenula and ectopic tooth eruption. Precipitating factors lead to an acceleration of the defect, such as traumatic tooth brushing and piercing (Genco, 1996). Controversy exists in the literature between the role of orthodontic treatment and gingival recession. Whilst, movement of teeth outside the alveolar bone has been reported as a risk factor for gingival recession (Wennstrom et al., 1987), others have found no such association (Ruf et al., 1998; Djeu et al., 2002)

Good long-term (5 years) outcomes have been reported with connective tissue grafts and a coronally advanced flap (Pini Prato et al., 2010). Alternative methods include the Envelope technique with connective tissue graft (Raetzke, 2010) or the laterally positioned flap with or without connective tissue graft. Free gingival graft can be used in both single and multiple gingival recessions, it is associated with high morbidity due to graft removal from the palate and sometimes necrosis of the graft. A fraenectomy can also be considered. The importance of re-educating the patient in respect of their brushing technique was also highlighted, in conjunction to considering adjunctive cleaning aids, such as water picks and interdental toothbrushes.

To minimize the risk of gingival recession and maximize the benefit of the orthodontic treatment, the orthodontist must be aware of the risk factors identified in relation toquestion 4 and it is time that we, as a profession, took account of more than just the crown, but perhaps more importantly the roots and their proximity to the cortical plates. Thus, the mechanics or treatment modalities that could be employed to minimize the risk of recession include the following:

- Maintain good oral hygiene throughout orthodontic treatment and identify potential risk factors.
- Eliminate potential causes of recession (piercing, smoking, traumatic tooth-brushing)
- Avoid uncontrolled dento-alveolar expansion and maintain archform
- Customize bonding and mechanics
- Modify tooth anatomy whenever indicated
- Consider segment arch mechanics
- Create space before using it and use it wisely
- Consider atypical extractions e.g. compromised teeth
- Avoid jiggling because may cause periodontal problems
- Treat early (“interceptive” procedures and treatment in mixed dentition)
- Re-educate the patient in their oral hygiene technique after the end of treatment

CONCLUSION:

Laser technique now is widely applied in orthodontic treatment and proved to have many benefits. Soft tissue lasers can be used to perform all postorthodontic retentive esthetic measures in periodontium which includes gingivectomy, frenectomy, fibrotomy and surgical exposure of tooth with less bleeding and swelling, improved precision, reduced pain and less wound contraction

REFERENCES:

5. Olivi G, Chaumanet G, Genovese MD,