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FUNCTIONAL AND ESTHETIC REHABILITATION OF MAXILLARY ANTERIOR REGION WITH INTER-DISCIPLINARY TREATMENT MODALITIES.

Dental Science

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ABSTRACT

The management of maxillary anterior region is always challenging. In order to achieve predictable functional and esthetic outcomes, both hard and soft tissue management are often required. This case reports discusses treatment of midline diastema and subsequent esthetic prosthetic management of maxillary central incisors.

KEYWORDS

midline diastema; frenectomy; calcium hydroxide

Introduction

A frenulum (or frenum, plural frenula or frena) is a small fold of tissue, usually with enclosed muscle fibers, that secures or restricts the motion of a moving organ in the body [1-3].

Depending upon the extension of attachment of fibres, frena have been classified as: mucosal, gingival, papillary and papillary penetrating [4]. Sewerin categorized frenum governed by variation in the morphology as simple, persistent tectolabial, simple with appendix, simple with nodule, double frenum, frenum with nichum, bifid frenum and frenum with one or more variation of the above [5].

The Maxillary labial frenum also known as frenulum labii superioris is a fold of the mucous membrane which hitches the lip to alveolar process. This paper describes a case of treatment midline diastema along with root canal treatment of traumatized maxillary central incisors to improve function and esthetics.

Clinical Presentation

A 21 year old female patient reported to the department of dentistry at ESIC Model Hospital, Noida, India in October 2016 with the chief complaint of spacing in upper front teeth. Oral examination revealed midline diastema, fractured and discoloured maxillary central incisors (11, 21) along with high maxillary labial frenum attachment and a positive frenal pull (Figure1). Patient gave a history of trauma 5 years back. She also added that she had difficulty while eating as it caused burning sensation at frenal muscular attachment. Patient was concerned about her esthetics as well.

Case Management

Frenectomy and root canal treatment of maxillary central incisors was planned for the patient. An informed consent was taken from the patient after explaining the procedure. Following local anesthesia (2% lignocaine, adrenaline 1:80,000) surgical excision of the frenum was carried out. The frenum was held with a pair of hemostats a V-shaped full-thickness incision was placed at the gingival base of frenal attachment (Figure2). The complete band of the tissue attached to the lip together with its alveolar attachment was excised with a number 15 blade (Figure3, Figure4). After dissecting the fibrous attachment from the underlying periosteum, the wound was closed with silk sutures (3 0 Ethicon non absorbable silk suture) and covered with Coe pack (Figure5). Patient was refrained from brushing at the surgical site and was instructed not to pull the lip or manipulate operated area for 2 weeks. Patient was instructed to rinse with 0.12% chlorhexidine twice daily for 2 weeks. Periodontal dressing and sutures were removed after 10 days (Figure6). Patient was recalled at second nd and fourth th week and then after every three months to monitor healing (Figure7).

The score for Plaque index [6] and Gingival index [7] for the upper anterior teeth were recorded at baseline and then after every three months.

A month after successful healing of the tissues; root canal treatment was initiated for the patient. Working length was established at two mm short of the radiographic apex .The root canals were prepared using K files in the crown-apex direction, using 5.25% sodium hypochlorite for irrigation after each file.(Chemical Institute, UNESP, SP, Brazil). After through irrigation with saline, the root canals were dried with paper points and filled with a calcium hydroxide-based paste (Calen-PMCC: 2.5 g calcium hydroxide, 1 g zinc oxide p.a., 0.05 g colophony, 2 ml polyethylene glycol 400, 0.04 g paramonochlorop henol; S.S. White Artigos Dentários, Rio de Janeiro, RJ, Brazil).The pulp chamber was filled with a sterile cotton pledget and the crown opening was sealed with zinc oxide-eugenol cement. As teeth were chronically infected; calcium hydroxide dressings were changed periodically.

Based on the results of the study by M.R. Leonardo et al [8], canals were filled with calcium hydroxide dressing for 30 days. Teeth were obturated only after ensuring the sterility of canals. Keeping esthetics in consideration all porcelain crowns were fabricated for the patient (Figure7).

Discussion

Achieving esthetic and functional rehabilitation in the maxillary anterior area is an important requirement to consider a treatment as a success especially in young patients. However the treatment comprises of therapeutic construction including several surgical and prosthetic steps.

The use of root canal dressings between recall visits in root canal treatment of teeth with chronic periapical lesions is imperative for reducing bacteria beyond levels obtained solely with mechanical preparation, particularly by penetration of areas that are unreachable by instruments or irrigation solutions, such as dentinal tubules and ramifications [9-13].

Root canal dressings are chosen based on their diffusion, toxicity and inflammatory potential [14]. However, most medications are nonspecific, and may induce exaggerated host inflammatory response and discomfort for the patient [15]. Calcium hydroxide in particular has shown clinical efficiency in reducing exudate due to its hygroscopic properties and aids in stimulating apical and periapical repair, with no or minimal discomfort[16,17]. Furthermore, owing to its antibacterial and biological properties calcium hydroxide is a preferred root canal dressing material [18,19].

In accordance with the study by M.R. Leonardo et al [8], canals were

packed with calcium hydroxide for 30 days. Their study [8] demonstated an accentuated decrease in inflammation at 30 days compared to shorter duration wherein edema, severe mixed inflammatory infiltrate containing mononuclear cells and polymorph onuclear neutrophils was prevalent. Whereas at 30 days, mild inflammation without neutrophils along with an intense neoformation of collagen fibers indicating evolution of the repair process was observed. Underlying hypothesis is that high alkalinity and antibacterial activity aids in the reduction of the inflammatory reaction because tissue destruction occurs mainly in acid pH, and calcium hydroxide acts as a buffer [8].

Another study reports that calcium hydroxide reaches a pH of 9.0 in the region of apical cementum after only 2-3 weeks [20].

A marked reduction in plaque index and gingival index (Table1) was observed as improved oral hygiene and decreased gingival inflammation.

Patient was comfortable while eating with no interface by frenum. The treatment of the patient not only improved her esthetics but also functionality. Subsequent to the correction of midline diastema, marked improvement in the phonetics was also observed in the patient.

Conclusion

The use of a multi-discipline and multi-step approach is often the ideal way to a stable esthetic and functional outcome. This approach is now a key philosophy of modern dentistry, and should be always kept in mind by all clinicians.

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Figure legends

Figure1.A: Preoperative photograph of the patient reveling high frenal attachment along with fractured and discolored maxillary central incisors.

B: Photograph showing dissected frenum.
C. Photograph showing 10 days post-operative healing.
D. Postoperative situation: Note the final healing with no signs of recurrence of frenum and prefect esthetic outcome with porcelain jacket crowns.

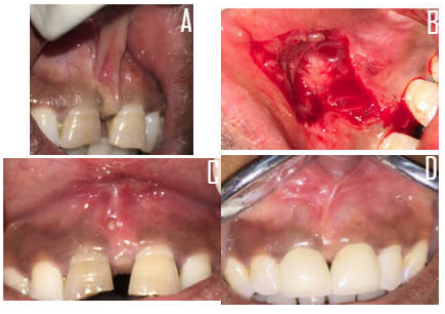

Table 1: PI and GI scores at baseline and follow-up

	PI	GI
Baseline	0.5	0.5
3 months	0. 25	0.5
6 months	0	0. 25
9 months	0	0
12 months	0	0

*PI: Plaque Index
*GI: Gingival Index

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