Case Report

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Management of Fenestration in a Non-vital Maxillary Lateral Incisor Using Connective Tissue Grafting: A Pin-hole Surgical Technique.

Abstract:

Mucosal fenestration is clinical entity in which the overlying gingiva or mucosa is also denuded thus the root is exposed to oral cavity. If left untreated, they may be a source of infection by giving entry to oral pathogen,leading to further progression of periodontal disease. Depending on their site of presence, they may also be a reason of esthetic concern to some patients. This case report describes a situation where a mucosal fenestration developed in the upper left lateral incisor, which was successfully treated with followed by subepithelial connective tissue grafting.

Key-words: CTG, Fenestration, Pin hole technique

Introduction:

Mucosal fenestration is a clinical condition in which the root apex of an affected tooth is visible in the oral cavity due to loss of alveolar bone and mucosa overlying the tooth. Mucosal fenestrations have been reported in literature but are far less prevalent as compared to normal fenestration.[1] Mostly found in the maxillary and mandibular anteriors, particularly on the labial aspect, due to extreme labial angulation of tooth roots.[2]

Treatment options for mucosal fenestration have included free gingival grafting, guided tissue regeneration, full thickness mucogingival flap with primary closure, pedicle flap surgery, endodontic treatment of the afflicted tooth, followed by apicectomy, and root planning.[3] The following case report describes a situation where a mucosal fenestration developed in the upper left lateral incisor which was successfully treated with followed by subepithelial connective tissue grafting

2. Case report:

A 21-year-old patient reported to the opd with the chief complaint of bleeding in upper front teeth region for 6 months. On clinical examination maxillary right lateral incisor had Ellis class III fracture with RT1 gingival recession. Alveolar mucosal fenestration was present exposing the apical one third of the root of the lateral incisor association with plaque and inflammed surrounding alveolar mucosa. There were no pocket and mobility associated. An intraoral periapical radiograph revealed presence of intracanal medicament apparently, resorption of root apex in concordance with periapical radiolucency. All the clinical and radiological findings were consistent with the lesion being primary endodontic and secondary periodontic lesion with mucogingival deformity.

Considering the patients age, position of tooth. Prompt and elective treatment plan was required in order to rectify the

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overall appraisal and maintenance of the lateral incisor in esthetic zone. Accomplishment of complete root canal therapy followed by covering the exposed root apex and restoring the anatomical morphology of the crown were core objectives of the treatment plan.

Minimally invasive modified tunnel technique with subsequent connective tissue grafting was planned in accordance with the existing gingival recession in relation to the lateral incisor.

2.1 Procedure:

2.1.1 presurgical protocol

Treatment plan was explained to the patient. Informed and written consent were obtained. Complete scaling and root planing was done. Root canal therapy was performed. Oral hygiene maintainence instructions were given. Patient was kept on regular follow ups.

2.2 surgical protocol

2.2.1 Incision

The similar protocol as of Pin hole surgical technique[4] (chao, 2012) was employed. After administration of local anaesthesia, 2% lidocaine with 1:80000 adrenaline. TK1 tunnelling instrument was used to make tunnel by underminingthe mucosa into split thickness flap around the fenestration. The dissection was extended laterally and apically to the exposed root tip.

2.2.2 Connective tissue grafting

The bicuspid region on the right side of the palate was chosen as donar site for autogenous connective tissue. The site was anaesthetised, using trapdoor technique which utilises one horizontal incision placed 3mm away from the gingival margin of first bicuspid extending towards first molar. Two vertical incisions both on the either end of initial incision. The flap was elevated towards the centre to expose the underlying connective tissue. Incision around the edge of the connective tissue perpendicular to the palatal bone were given to facilitate its reflection. A small periosteal elevator was used to harvest the graft.

2.3 Suturing

The donor site was sutured using cross sling sutures with 3.0 silk sutures.

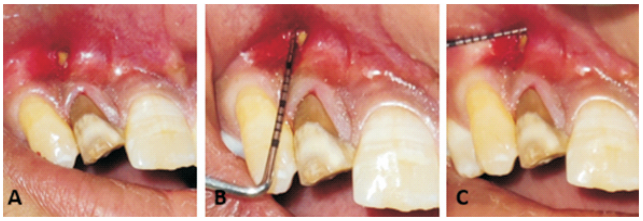

Fig. 1 shows mucosal Fenestration in relation maxillary right lateral incisor

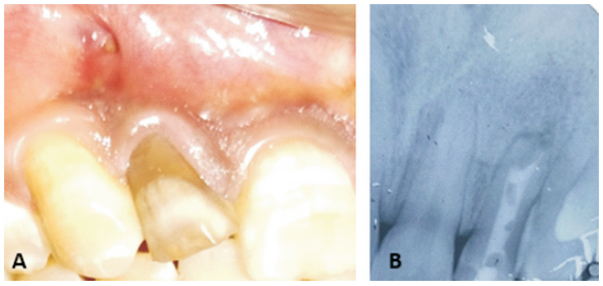

Fig. 2 (A) Clinical appearance 3 weeks post scaling, root planning, curettage, and (B) Post endodontic treatment

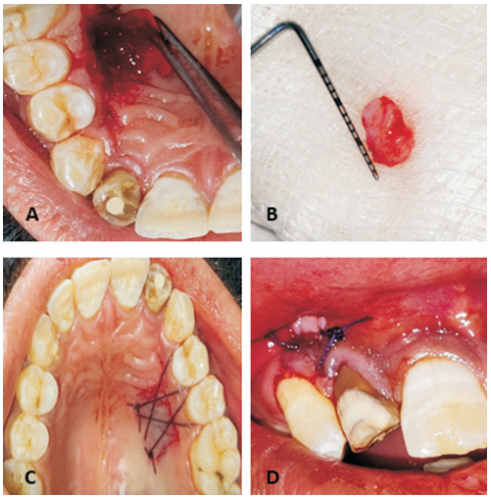

Fig 3. Mucosal fenestration coverage by Connective tissue Grafting

4A & B shows 3 months post-operative picture.

Discussion :

Mucosal fenestration is a clinical condition in which the gingiva or mucosa overlying the root is also denuded, exposing the root to the oral cavity.

The epidemiological data according to Wong J et al in 2021, reports that most commonly these defects are seen in central incisors, as reported in 6 cases (21.4%), followed by maxillary first premolars, maxillary lateral incisors and mandibular central incisors, all of which had 5 cases each (17.9%).[5]

Although the exact cause is unknown, review of the literature indicates that persistent periapical inflammation, abnormally labioversed root ends, and thin labial plates may be the likely cause.[6]

Furthermore, it has been noted that exposed root tips encourage the buildup of plaque and calculus, which hinders the regrowth of mucosal covering [7].

Treatment options have been proposed in a number of case reports. Root canal treatment and apicectomy[8,9,10], blind root surface instrumentation and chlorhexidine mouth rinsing,[11] full thickness mucogingival flaps with primary [12] or secondary healing,[13] full thickness mucogingival flaps with guided tissue regeneration and bone.[8,10] The connective tissue graft, also known as subepithelial connective tissue graft or a free connective tissue graft, was first described by Langer & Calagna[14] and is used to obtain root coverage.[15,16,17] Successful treatment of gingival fenestration with connective tissue grafting is ascertain.[18]

The mucosal fenestration in the present case was not associated with presence of periodontal pockets and interdental boneloss, as per transgingival bone sounding performed under local anaesthesia. Therefore, no attempt of bone regeneration was undertaken. In order to treat the existing defect, prevent recurrence and render a more conducive environment for the proper maintenance of the oral hygiene by patient, CTG was planned, as it is gold standard for long time prognosis, modifies tissue thickness and has ability to remain exposed.[19] The blood vessels of the graft anastomoses with the periosteum and underlying bone in 2-3 days.[20] Elevation of the full thickness flap with vertical releasing incision was restrained due to prior presence of recession and full thickness flap elevation results in bone loss and elevated osteoclastic activity.[21] Minimally invasive tunnel technique which is a modification of supraperiosteal envelope technique was employed. This technique has several advantages, it minimizes the injury to marginal gingival complex which reduces the risk of further recession, interdental papilla remains intact which ensures the optimum vascularity, greater patient compliance as there is less bleeding and more esthetic outcome is achieved.

IOPAR of the lateral incisor revealed traumatic root resorption[22] along with periapical radiolucency hence obturation with bioceramic sealers on the day of surgery was done once tunnelling around the defectwas attained. Bioceramic based sealers are hydraulic sealers which can be used in direct contact with blood and tissue fluids and release calcium hydroxideon interaction with the tissue fluids and phosphates leading to formation of hydroxyapatite nuclei while setting reaction.[23] These apatite nuclei grow spontaneously in presence of calcium and phosphate ions,[24,25] thereby responsible for tissue inductive properties of the sealer.

Minimally invasive surgical techniques with CTG results in optimal healing, favourable esthetic outcome without any adverse effects and greater patient acceptance.This case report describes a successful coverage of mucosal fenestration by using a CTG, which was done after the apicectomy of the root apex.

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