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Management Of Mucosal Fenestration Using PRF And Tetracycline Fibres: A Case Report

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Abstract: ***A case of mucosal fenestration at the apex of RCT done tooth with complain of pain and discomfort at the apex of the affected tooth for a period of 3 months. This case was successfully treated using PRF and Tetracycline fibres (Periodontal plus AB) after performing apicoectomy. Diode laser was used as an adjunct to facilitate haemostatis and cause tissue ablation.***

I. INTRODUCTION

Early evidence of the interest regarding the correlation between the alveolar processes morphology and the teeth dates back to 1963, when O' Connor studied the relationship of teeth with the interproximal bone, tooth anatomy the presence of fenestrations and bony wedges 1.Isolated areas in which root is denuded of bone and root surface is covered only by periosteum and overlying gingiva are termed fenestration.2

Fenestration is a localized defect of the alveolar bone plate that exposes the root surface usually the apical or the medium third that does not involve the alveolar margin. Traditional textbook of anatomy lack information on dehicences and fenestrations whereas famous periodontists consider them important anatomic entities when related to periodontal surgery affecting 20% of the teeth more commonly placed on the anterior than on the posterior region of the jaws.3 Gingival fenestrations have multifactorial entities such as decreased thickness of the alveolar bone, labial placement of the tooth in the dental arch, contour of the root apex, abnormal occlusal factors, orthodontic tooth movement, periodontal and endodontic pathology and abnormal frenal attachment.4Microscopic evidence of lacunar resorption may be present at the margins. The causes of these defects are not clear. However, predisposing factors include prominent root contours, malposition and labial protrusion of the root in combination with a thin bony plate 5.

The incidence of apical fenestration is between 7.5% and 20%, and is higher in the maxillary than in the mandibular teeth. It has also been reported that the incidences higher in the anterior than in the posterior teeth. The most commonly observed regions are the canine root and the mesio-buccal root of the maxillary first molar. 6 Mucosal fenestration is a clinical condition in which the overlying gingiva is denuded and the root is exposed to the oral cavity. Mucosal fenestrations are considered "an uncommon complication of pulpal-periradicular disease" 7

A particular and rarely encountered phenomenon is when an apical fenestration is accompanied by a mucosal fenestration. In this situation, the root apex perforates both the alveolar bone plate and its overlying soft tissue, being exposed to the oral environment. Peacock ME et al. appreciate that mucosal fenestration may be more common than has been reported as lack of symptoms may inhibit patient awareness. 8

The objective of this case report was to describe a treatment modality used to manage an apical mucosal fenestration placed on lower left lateral incisor.

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II. CASE REPORT

A 45 year old male patient reported to the Department of periodontology Rama dental college, India with chief complaint of pain and discomfort in lower left lateral incisor region Patient had undergone root canal treatment in the same tooth since then the pain persisted. The surgical protocol included a routine medical history followed by blood investigations On clinical examination localized swelling and in the apex and exposure of the apical root of lower lateral incisor. There was opening of 1.5 mm by 1 mm. Radiographs revealed radiolucency at the periapical region Treatment plan was explained to the patient and written consent for the treatment was obtained.

The surgery was initiated after administration of local anesthesia. The surgical procedure included reflection of a full thickness mucoperiosteal flap by semilunar incision in the vestibular region 4mm apical to the lesion exposing the root apex Heavy accumulation of granulation tissue was seen around and beneath the root apex which was removed by using curretes. Hemostasis was obtained by using diode laser. Final ablation of the walls of the lesion was done by use of diode laser. Apicoectomy was performed and 1mm of root apex was removed. Tetracycline fibres were placed. Debridement of tissues at the defect site was followed by irrigation with sterile saline solution. PRF was placed.

III. PROTOCOL FOR PRF PREPARATION

10 ml of venous blood was drawn from the patient. Whole blood was drawn into the tubes without anticoagulant and immediately centrifuged at 3,000 rpm for 10 minutes. Within a few minutes, the absence of anticoagulant allows activation of the majority of platelets contained in the sample to trigger a coagulation cascade. The result is a fibrin clot containing the platelets located in the middle of the tube, just between the red blood cell layer at the bottom and acellular plasma at the top.

This clot was removed from the tube and the attached red blood cells scraped off and discarded. PRF gel was carefully placed into the cavity till the entire cavity was filled. Wound closure was performed with a 3-0 black silk suture. Analgesics and Antibiotics were prescribed post-operatively.

IV. RESULTS

Patient was recalled after 24 hrs. No postoperative complication was observed. The sutures were removed after seven days. Complete closure of wound was observed with appreciable healing after seven days. The patients were reviewed after one week one month and six months. Intervals

V. DISCUSSION

Mucosal fenestration, a pathologic condition rarely encountered in clinical practice may sometimes accompany an apical alveolar fenestration, worsening the prognosis of the affected tooth. In this case, a root apex perforates both the alveolar bone plate and its overlying soft tissue, being exposed to the oral environment, the chief complaint is related to discomfort. Reports with regard to mucosal fenestrations are scarce. It was first described by Menéndez OR in 1967. In 1971, Serrano J used the comprehensive term "gingivo-osseous pathologic fenestration" to describe this condition. Most reports on mucosal fenestrations refer to deciduous teeth affected by traumatic intrusion, attrition, disturbed root resorbtion. Etiologic factors in relation with permanent teeth include: tooth/jaw ratio, root prominences, developmental anomalies, periodontal disease, chronic periapical pathosis, orthodontic tooth movement, trauma and strong occlusal forces. A combined mucosal and alveolar fenestration is commonly associated with a non-vital tooth, as we found in the clinical case above. A peri-radicular lesion was evident on periapical radiography in the case we described A comprehensive approach was applied in this clinical case. Endodontic treatment was performed in order to eliminate the microorganisms from the root canal system, surgical procedure in order to correct the mucogingival defect and to stimulate bone healing and regeneration, The surgical intervention consisted in apical root remodeling, aiming to harmonize its morphology with the alveolar housing, followed by correction of the mucosal defect.

PRF by Choukran's technique is prepared naturally without addition of thrombin and it is hypothesized that PRF has a natural fibrin framework and can protect growth factors from proteolysis. Thus, growth factors can keep their activity for a relatively longer period and stimulate tissue regeneration effectively. The main characteristics of PRF compared with other platelet concentrates, including platelet rich plasma (PRP), are that it does not require any anti-clotting agent. The naturally forming PRF clot has a dense and complex 3-D architecture and this type of clot concentrates not only platelet but also leukocytes. PRF is simpler and less expensive to prepare, as well as being less risky to the patients. Owing to its dense fibrin matrix, PRF takes longer to be resorbed by the host, which results in slower and sustained release of platelet and leukocyte derived growth factors in to the wound area.

In this case report, the decision to utilize minced PRF as defect fillers in combination with alloplast was made due to its ease of manipulation and delivery to the surgical site.

PRF could improve the periodontal osseous defect healing, as PRF can up regulate phosphorylated extracellular signal regulated protein kinase expression and suppress the osteoclastogenesis by promoting secretion of osteoprotegerin (OPG) in osteoblasts cultures. PRF also demonstrates to stimulate osteogenic differentiation of human dental pulp cells by upregulating OPG and alkaline phosphatase (ALP) expression.

Furthermore, many growth factors are released from PRF as PDGF, TGF and have slower and sustained release up to 7 days and up to 28 days, which means PRF stimulates its environment for a significant time during remodeling. Moreover, PRF increase cell attachment, proliferation and collagen related protein expression of human osteoblasts. PRF also enhances phosphorylated – extracellular signal regulated kinases, OPG and ALP expression which benefits periodontal regeneration by influencing human periodontal ligament fibroblasts.

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Rationale for using tetracycline fibre (periodontal plus AB) in this particular case is to enhance perio regeneration. These fibres provide continuous release of tetracycline for a minimum of 10 days. Tetracycline fibres are primarily bacteriostatic agents particularly effective against Gram neg species. They have antibacterial activity, collagenase inhibition, inhibition of bone resorption, anti-inflammatory actions and ability of tetracycline to promote the attachment of fibroblast and connective tissue to root surface.

VI. CONCLUSION

According to the results obtained in this case report, it could be concluded that the positive clinical impact of additional application of PRF with alloplastic graft material in treatment of periodontal intrabony defect is based on

- ✓ Significant radiographic defect bone fill.
- ✓ Improved patient comfort.
- ✓ Early wound healing process.

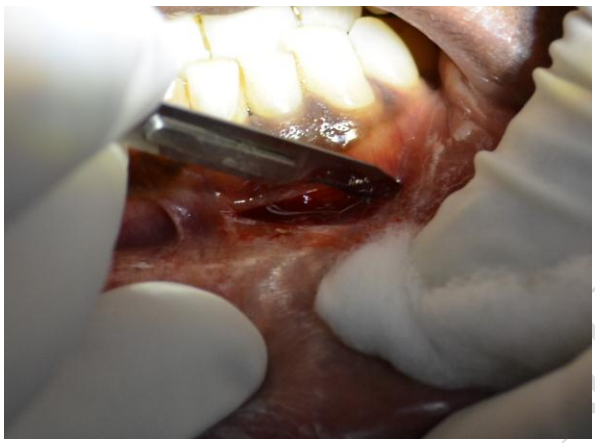
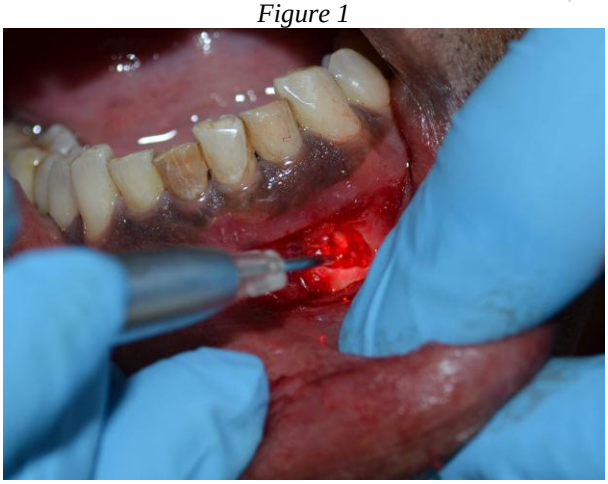


Figure 1



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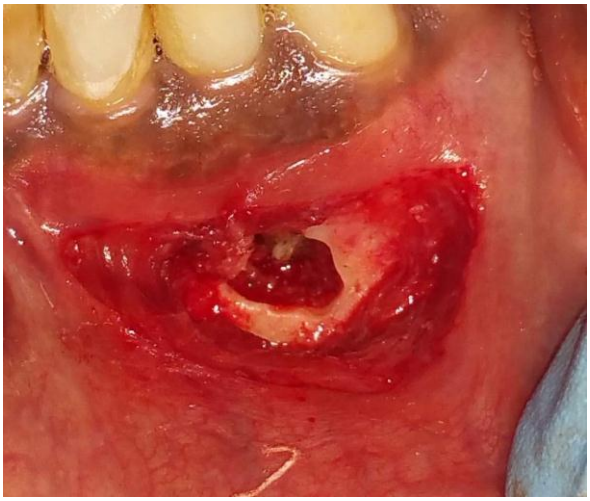

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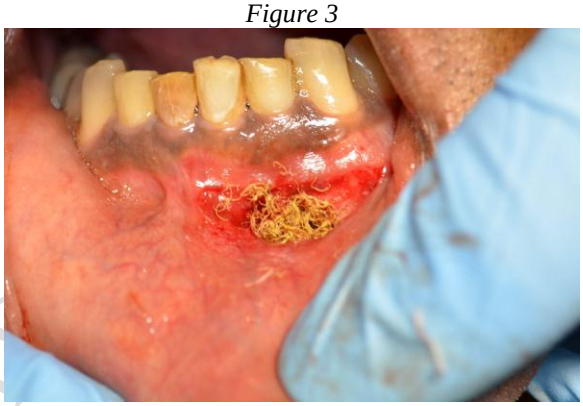

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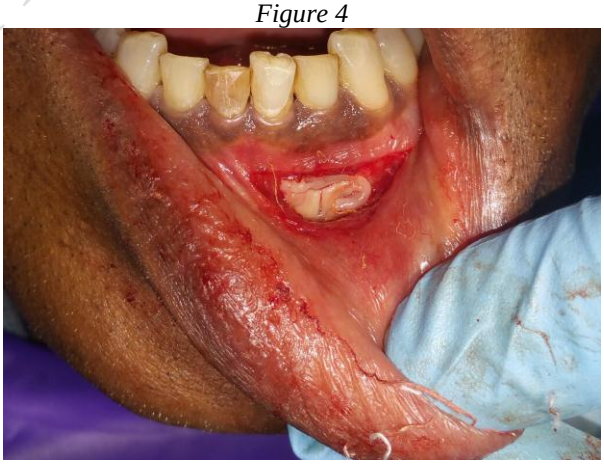

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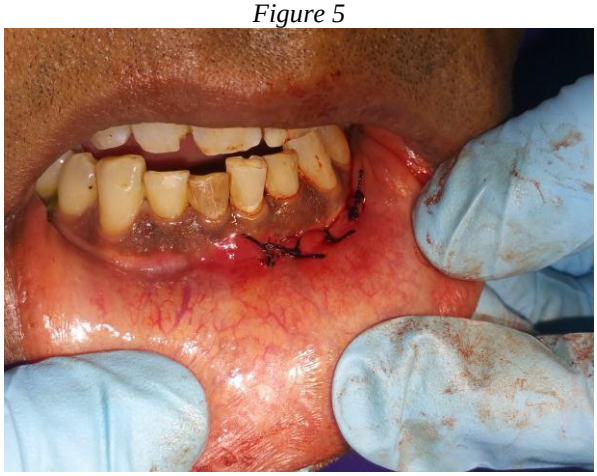

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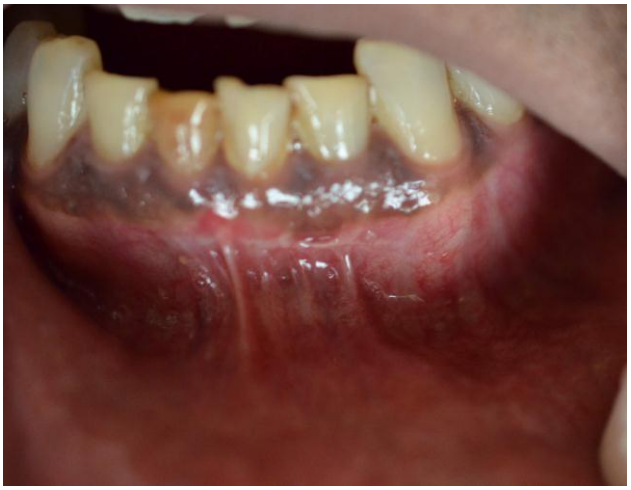

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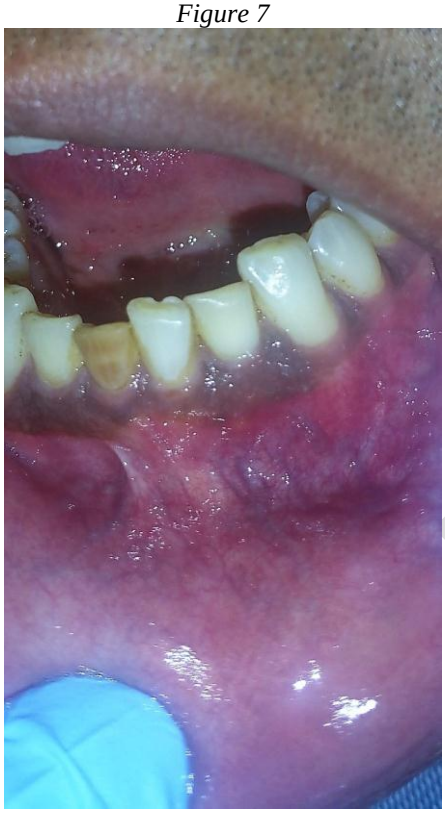

Figure 8

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