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Management of Primary Periodontal lesion with Secondary Endodontic involvement using Novabone Dental putty®: A clinical case

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ABSTRACT:- The simultaneous involvement of pulpal problems and inflammatory periodontal disease in Endodontic-periodontal lesions can complicate both diagnosis and treatment planning. In the present case report the tooth involved was maxillary left first molar which was first endodontically treated followed by periodontal surgery and placement of a syringeable Novabone putty bone graft.6 months post operatively there was a significant amount of bone fill observed in radiograph.

Keywords:- bone graft**,** endodontic-periodontal lesion, root canal therapy

I. INTRODUCTION

Periodontic-endodontic lesions are complex in nature with varied pathogenesis. Its diagnosis, and treatment has always been a challenge for the dentist. Simring and Golberg described the relation between pulpal and periodontal disease in 1964[1].Bacterial cross-infection between root canal and periodontal ligament can occur through various routes. The most followed classification of Endodontic-Periodontal lesions, is given by Simon, Glick and Frank in 1972 into following group[2]:1. Primary endodontic lesion 2. Primary endodontic lesion with secondary periodontal involvement,3.Primary periodontal lesion,4.Primary periodontal lesion with secondary endodontic involvement 5.True combined lesions.

This article presents a case report of a primary periodontal lesion with secondary endodontic involvement in maxillary left first molar. This was first treated by endodontic treatment followed by periodontal regenerative procedure using syringeable Novabone putty bone graft®.

II. CASE REPORT

A 35 year old male patient came to the Outpatient Department of Periodontology, Faculty of Dentistry, Jamia Millia Islamia with the chief complaint of difficulty in chewing from upper back region of jaw. He had a history of orthodontic treatment which was completed 3 years back following which he observed a gradual increase in mobility of left maxillary first molar. He was systemically healthy and medical history was non contributory. On clinical examination there was minimal plaque and calculus. Tooth 26 was grade II mobile and tender on percussion. Probing pocket depth of 6mm,5mm,10mm and 10mm was recorded respectively on mesial, buccal ,distal and palatal aspects of tooth 26 by UNC-15 periodontal probe. Tooth was non carious, however was non vital and didn't respond to electric pulp tester. In Orthopantomogram(OPG),periapical pathology and periodontal bone loss was observed both mesial and distal to 26(Figure1).Clinical and radiographic examination was suggestive of diagnosis of Periodontal lesion with secondary endodontic involvement in 26.

Treatment plan was explained to the patient. Full mouth scaling and root planing was done followed by occlusal reduction and endodontic treatment for tooth 26.On subsequent visits tenderness on percussion of tooth 26 decreased and thus periodontal flap surgery was planned.

2% local anaesthesia with 1:200000 adrenaline was administered and a full thickness mucoperiosteal flap was elevated from tooth 23 to 27.Periodontal bone defect involving mesial, palatal and distal aspect of tooth 26 was observed. Bone loss also extended to involve mesiopalatal furcation (Figure 2).After removing granulation tissue, thorough root planing was done with Hu-Freidys Gracey curettes. Syringeable bone graft material (Novabone dental putty bioactive alloplast bone graft) was used to fill the defect (Figure 3,Figure 4). Flap was sutured with 3-0 silk sutures.(Figure 5). Post-operative medications and instructions were given to the patient. Sutures were removed after 1 week and it was found that soft tissue healing is satisfactory. Patient was reviewed at 1 months, 3months and 6 months.

At 6 months, on clinical examination it was observed that mobility of tooth 26 reduced from Grade II to Grade I. Probing pocket depth was reduced to 4mm, 3mm, 6mm and 6mm respectively on mesial, buccal,

distal and palatal aspects. Intra-operative periapical radiograph(IOPAR) also showed bone formation in relation to 26(Figure 6).

III. DISCUSSION

Management of Endodontic-Periodontal lesions have always been a challenge to clinician; especially when complicated by furcation involvement. Treatment strategy for Endo-Perio lesion should be first on the pulpal infection and performing disinfection of root canal system. After evaluating result of endodontic treatment deep scaling and periodontal surgery should be performed.

In the present case, there was no carious lesion in tooth 26; however tooth was associated with deep periodontal pockets and tooth was also non vital. Radiographic examination showed advanced periodontal bone loss in relation to 26. These findings were suggestive of diagnosis of Primary periodontal lesion with secondary endodontic involvement according to Simons Classification[2]. Patient gave a history of orthodontic treatment completed 3 years back after which he developed the concerned lesion. Previous studies have shown that excessive functional stress caused by orthodontic forces can enhance the periodontal destruction in the presence of dental plaque[3-5]. In many orthodontic patients, mechanical irritation caused by orthodontic band or dental cement is one of the primary reason for periodontal inflammation[6]. Studies have also suggested that adult patients with pre- existing periodontal disease are at a higher risk of developing periodontal problems[7,8]. In the present case patient underwent orthodontic treatment at the age of 30 years and his level of oral hygiene and periodontal status before the orthodontic treatment is not known. Thus a possible pathogenesis for the periodontal destruction caused in the current case, particularly localised to one tooth (26);could be an aggravated inflammatory response caused by increased orthodontic forces or other iatrogenic irritants involved during the orthodontic treatment.

Three main pathways have been implicated regarding spread of infection from periodontium to pulp in the development of periodontal-endodontic lesions: apical foramen, lateral and accessory canals and the dentinal tubules[9,10]. Authors have reported that bacterial components of the inflammatory process may reach the pulp when there is accessory canal exposure or through apical formaen[11,12]. However, another research demonstrated that dentinal tubules act as a main reservoir for microorganisms[13]. In the present case also a possible source of pulpal necrosis in absence of carious lesion could be ingress of periopathogens from periodontal pocket into pulp via lateral or accessory canals.

Scaling and root planing is the first line of treatment to halt the progression of periodontitis and repair disease defects. However, regenerative periodontal surgery aims at both eliminating periodontal pocket and regenerating new attachment apparatus. A myriad of choices are available for bone replacement material for periodontal defects ranging from autogeneous to allogenic to alloplastic. Non autogeneous bone grafts are more widely accepted by clinicians as it eliminates a need for donor sites. Many studies have reported the use of bone grafts with membrane as a supporting device for bone augmentation in various conditions including Endodontic–periodontal lesions[14-16].Hydroxyapatite shows osteoconductive properties and act as a scaffold for the in-growth and subsequent deposition of the new bone.

Recent researches have suggested a role of bioactive glass for bone regeneration in periodontal osseous defects[17,18]. Bioactive glass is biocompatible having a positive stimulatory influence on osteoblast and inhibitory effect on fibroblast proliferation and apical migration of junctional epithelium. Bioactive glass particles get replaced by new bone not just by osteoconduction as shown by hydroxyapetite but also by osteostimulation. Novabone putty® is manufactured by Novabone, Florida and is available in putty consistency. It consists of two particle phases: Phase 1 (Bioactive glass particles;90-710µ) and Phase II(calcium phosphosilicate;32-125 µ).Physical characteristics and handling properties are improved by Phase II particles. Putty consistency makes manipulation and adaptation of bone grafts easier to the defect. Osteostimulation properties and better handling makes Novabone putty a better alternative to Hydroxyapetite bone graft for periodontal defects. Bembi et al reported a better percentage of bone fill with Novabone putty as compared to porous hydroxyapetite[17]. In another study by Grover et al, Novabone Dental Putty resulted in statistically significant improvements in radiographic osseous defect measurements and clinical parameters and was very well tolerated by the subjects[18].

IV. CONCLUSION

Endodontic-Periodontal lesions has a complex pathogenesis and requires an interdisciplinary approach between different disciplines like Periodontology and Endodontics. Comprehensive management of the Endo-Perio lesions as illustrated in the present case can impede the loss of the natural tooth and delay the more complex treatments.

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Figure legends

Figure 1

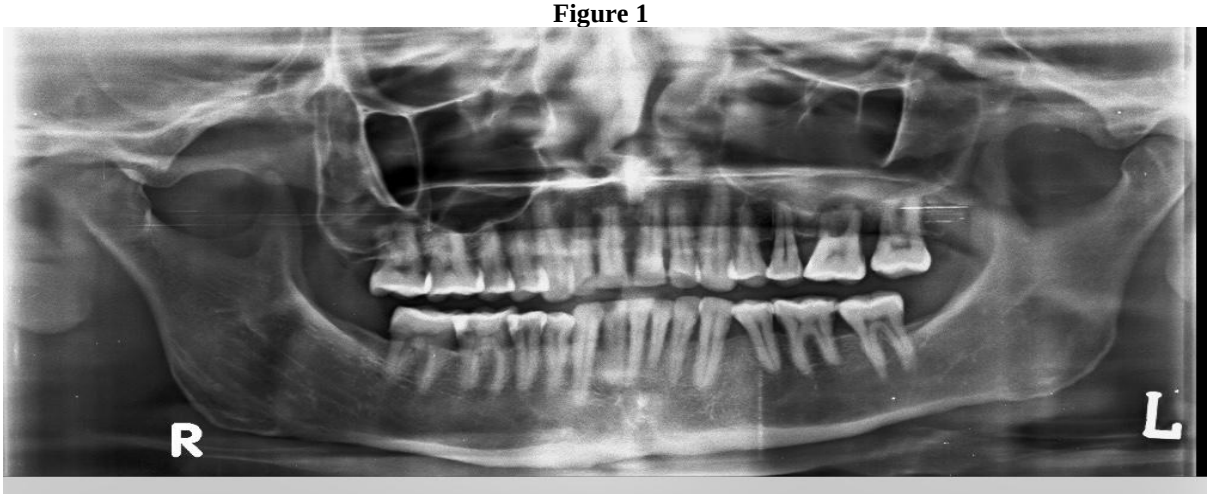

Figure 1: Orthopantomogram(OPG) showing periapical pathology and severe periodontal bone loss distal to 26

Figure 2

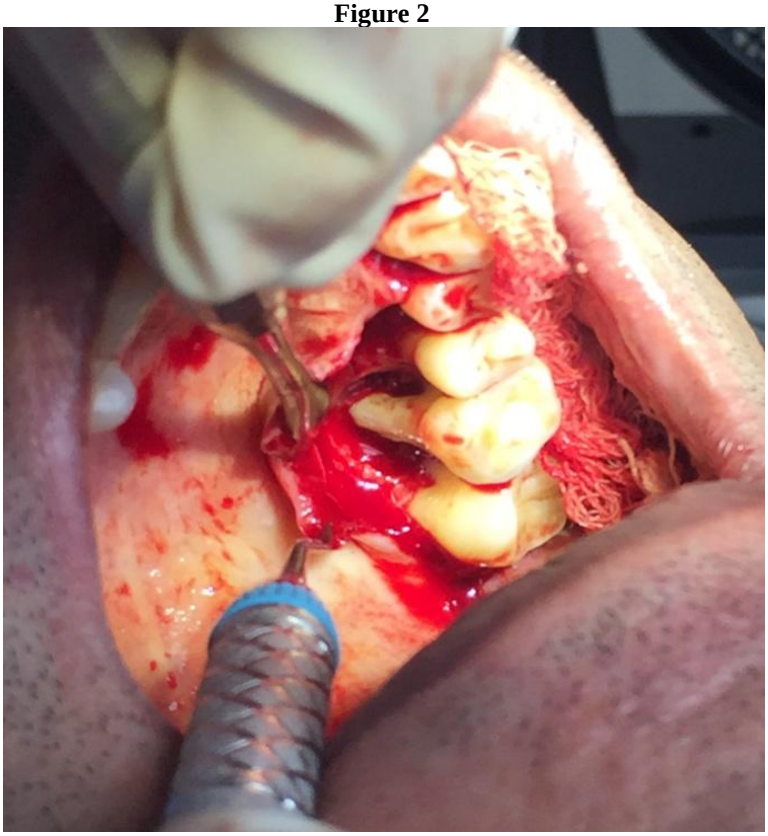

Figure 2: Periodontal bone defect involving mesial, palatal, distal aspect and mesiopalatal furcation of tooth 26.

Figure 3

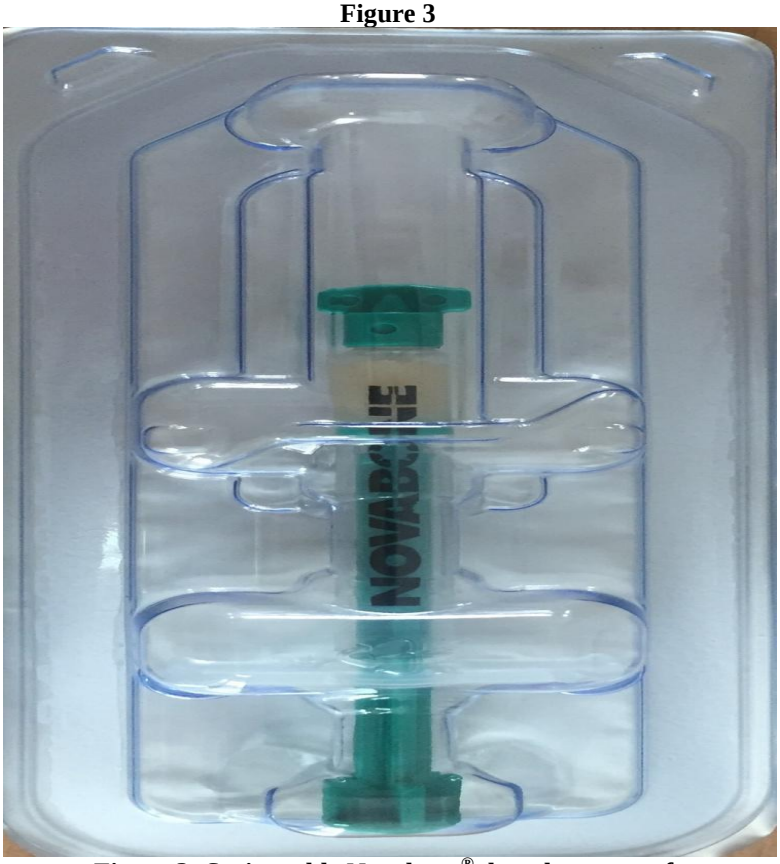

Figure 3: Syringeable Novabone® dental putty graft

Figure 4

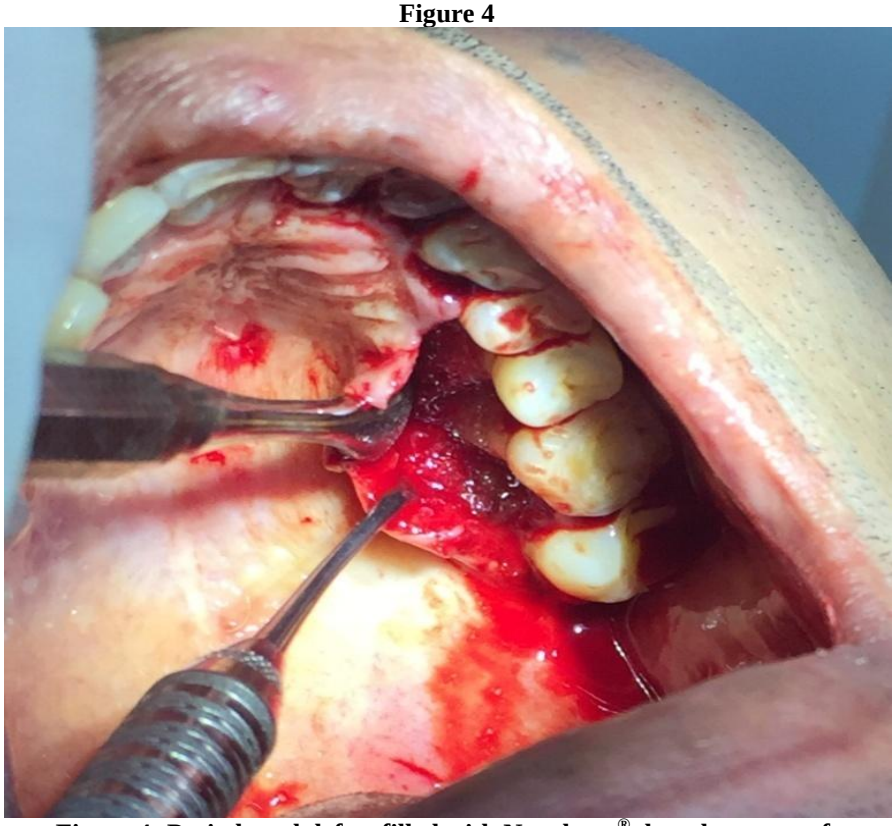

Figure 4: Periodontal defect filled with Novabone® dental putty graft

Figure 5

Figure 5: Flap sutured with 3-0 silk sutures.

Figure 6

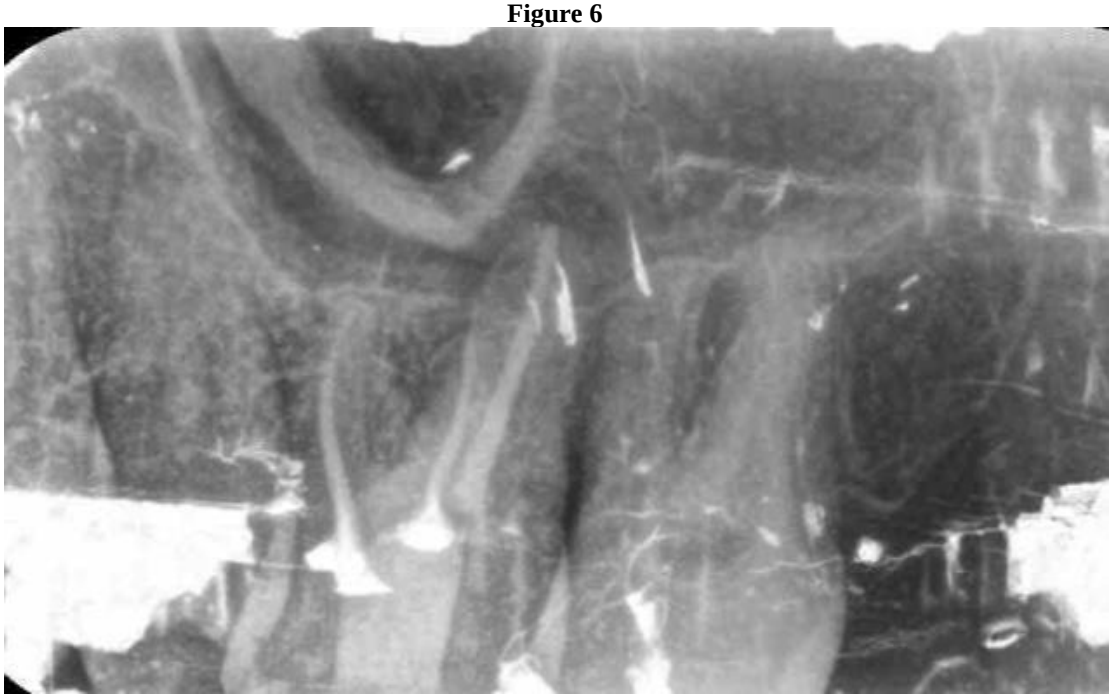

Figure 6: IOPAR taken at 6 months showing bone formation in relation to 26

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