

Management of Endo-Perio Lesion using Collagen Membrane: A Case Report

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Abstract

This case report describes the management of endo-perio lesion. A 40 year old patient reported with pain and discolored tooth with history of road traffic accident a year ago. Intraoral examination of tooth 11 revealed the presence of restorative material and a sinus tract opening with probing depth of 6mm. Following full mouth scaling, access opening and biomechanical preparation was done during which intra-canal irrigant was seen oozing through the sulcus of tooth 11. Multiple RVGs were taken as there was difficulty in negotiating the canal which suggested the presence of communication. Surgical intervention was carried out where root perforation was noted. Canal was negotiated and perforation was repaired using biodentine. Collagen membrane was placed as a barrier. Patient was recalled after 2 weeks, 1 month and at 3months. At the end of three months there was complete reduction in probing depth with satisfactory soft tissue healing. Proper diagnosis of the endo-perio lesion is the key to success. The multidisciplinary approach with accurate diagnosis contributed to the favorable therapeutic outcome.

Keywords: Biodentine, Collagen membrane, Endo-perio lesion, Mucoperiosteal flap, Perforation repair, Periodontitis.

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INTRODUCTION

The relationship between the pulpal and the periodontal disease was first described by Simring and Goldberg in 1964. They are the pulpo-periodontal communications characterized by the involvement of pulpal and periodontal disease in the same teeth. Apical foramen, dentinal tubules, lateral canals and the developmental grooves are the possible channels through which the infection spreads. The periodontal disease causes the spread of infection from coronal to apical direction which can communicate with endodontic lesions spreading in opposite direction. Most of the endodontic lesions are bacterial origin which infects the pulp and eventually communicate with the periodontal ligament if left untreated. In contrary, the exaggerated immune response can spread the infection from periodontal ligament space into the pulp [1].

Several classification systems of endo-perio lesions have been suggested. Simon classified it as

primary periodontal, primary endodontic and combined lesions [2]. The recent 2017 AAP classification system classified it as endo-perio lesions with root damage and without root damage. Root perforations, resorption and fracture are the lesions with root damage. The lesions without root damage are graded based on the probing depths [3].

The diagnosis of endo-perio lesion should include both pulpal and periodontal component of the lesion. The decision making should depend on the pulp vitality and the extent of periodontal involvement. Four treatment phases have been proposed for a combined lesion by Oh *et al.*, [4]; i) pre-surgical periodontal evaluation, ii) endodontic evaluation, iii) periodontal surgical and iv) post guided tissue regeneration re-evaluation protocol. The primary endodontic lesion with secondary periodontal treatment should be first treated with endodontic therapy following which the residual periodontal problems should be approached. Periodontal treatment can be done either by regeneration, root resection or hemisection [5].

The success of endo-periodontal therapy greatly depends on accurate diagnosis. Endodontic therapy should always precede if the primary aspect is left unevaluated, followed by wait and watch approach [6]. Hence the aim of this report is to describe the multidisciplinary clinical management of endo-periodontal lesion.

CASE REPORT

A systemically healthy 40 year old male patient was referred to our department with the history of pain in the upper front tooth region since a month.

Patient gives the history of road traffic accident a year back, following which he had experienced injury to the upper front tooth. Patient had undergone root canal treatment at the same time, which was discontinued after his first visit. Routine intra-oral examination revealed the presence of discolored tooth with sinus tract opening having a probing depth of 6mm on the buccal aspect of tooth 11 (Fig. 1). Radiographic examination presented a radio-opaque restorative material on the coronal aspect with no peri-apical changes (Fig. 2).



Figure 1: Pre-operative probing depth of 6mm with sinus tract w.r.t 11



Figure 2: RVG obtained at the baseline

Tooth was nonresponsive to the vitality test. Access cavity restoration was removed and re-RCT was advised. During the biomechanical preparation, it was noted that the intra-canal irrigants were oozing through the sulcus which caused difficulty in negotiating the

canal. Multiple RVGs were obtained to negotiate the canal which suggested the presence of endo-periodontal communication (Fig. 3). Hence surgical evaluation was advised.



Figure 3: RVG taken to negotiate the canal at the baseline

After administering sufficient local anesthesia, a full thickness muco-periosteal flap was raised on the buccal aspect with intra-crevicular and a vertical releasing incision on the distal line angle of tooth 11. Sufficient debridement was done. The presence of bony

dehiscence with root perforation was noted on the buccal aspect (Fig. 4). Following obturation, perforation repair was done using biodentine and collagen membrane (Fig. 5).



Figure 4: Flap reflection done with perforated root w.r.t 11



Figure 5: Perforation repair done using biodentine and collagen membrane placed

Flap was sutured using 5-0 vicryl sutures and periodontal dressing was placed. Post-operative instructions were given. Analgesics and antibiotics were prescribed for a period of 5 days. Patient was recalled after 2 weeks for the review. 3 months post-operatively,

probing depth was measured and RVG was obtained. There was reduction in probing depth with a well obturated canal. Satisfactory soft tissue healing was noted (Fig. 6 & 7).



Figure 6: 3 months post-operative probing depth of 2mm



Figure 7: RVG obtained 3 months post-operative

DISCUSSION

It is a challenging task for the clinician to accurately diagnose endo-perio lesions. The diagnostic accuracy is the pre-requisite which determines long term prognosis and treatment outcome. The clinical diagnosis of primary periodontal and primary endodontic lesion presents an easy task for the clinician. The treatment should begin with the vitality testing, although their diagnostic accuracy is quite satisfied. The comparison between cold test and electric pulp testing reported highest accuracy with cold test (0.9393) followed by electric pulp testing (0.8484) [7]. To obtain more accurate results, a combination of pulp vitality tests should be performed which is often not possible during the routine clinical diagnosis.

The infected root canal following traumatic injury and discontinuation of root canal treatment has resulted in the re-activation of inflammation process. The patient presented with chronic inflammation which has resulted in the sinus tract formation over a period of

time. The lesion clearly depicted the presence of communication or perforation. They are best treated using non-surgical therapy [8, 9]. As the patient presented with continuous oozing of the intra-canal irrigant from the sulcus with difficulty in negotiating the canal, surgical approach was carried out.

The occurrence of root perforation varies from 0.6% to 17.6%. They can be pathological (resorption or caries) and iatrogenic which negatively effects the prognosis of the treated teeth [10]. The patient here had reported with the history of trauma following which root canal treatment was advised, which was discontinued after the first appointment. Hence it was a challenging task for us to categorize and arrive at a definitive diagnosis without the available baseline reports.

Root perforation repair can be done using various materials including mineral trioxide aggregate (MTA), biodentine and endo sequence root repair

material. They are biocompatible, antimicrobial and are stable bioceramics [11]. Usage of MTA in perforation repair and resorption showed excellent results [12]. Due to its granular consistency, unpractical handling capacity with long prey time their use in perforation repair has been minimized [13]. Endo sequence root repair material shows good biological, mechanical property with excellent sealing ability which makes it a suitable root repair material [14]. Biodentine is a powder liquid bioceramic consisting of calcium silicate, tricalcium silicate, zirconium oxide and calcium carbonate [15]. They are highly stable, biocompatible, low cytotoxic with better sealing capacity [16]. Hence in the present case biodentine was used.

The major disadvantage of using a non resorbable barrier membrane is that it requires second surgical approach and membrane exposure which has detrimental effect on the therapeutic outcome [17]. To overcome this a resorbable barrier membrane was used over the biodentine. Guided tissue regeneration technique prevent the formation of long junctional epithelium and favours the repopulation of cells from the periodontal ligament and bone. Collagen membrane offers enhanced cell attachment capability, excellent tissue compatibility with weak antigenicity [18, 19]. Comparative evaluation of collagen membrane and platelet rich fibrin revealed similar regenerative outcomes in grade II furcation defects [20]. Bio-membranes such as platelet rich fibrin and its modifications can be used an alternative to collagen membrane.

The placement of barrier membrane over the biodentine can helps in preventing the apical migration of junctional epithelium. This would further favor the biodentine root repair process by inducing cell proliferation and biomineralization [21, 22].

CONCLUSION

Proper diagnosis of endo-perio lesion is the key to success. Perforation repair done using biodentine shows excellent results compared to the other bioceramics. Although case reports are important in knowing the biological response of various materials and methods for the clinical use, long term randomized clinical trials should be performed to obtain more reliable results.

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