



## HOPELESS TO HOPEFUL: a clinical study on management of periodontal abscess with grade II furcation involvement – endodontic and periodontal interdisciplinary approach: case report

*Da condenação à esperança: estudo clínico sobre o manejo do abscesso periodontal com envolvimento de furca grau II – abordagem interdisciplinar endodôntica e periodontal: relato de caso*

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### Abstract

**OBJECTIVES:** To present a case report of management of grade II furcation involvement associated with a periodontal abscess of mandibular right first molar utilizing an alloplastic bone graft. **DISCUSSION:** The case was diagnosed as periodontal abscess with grade-II furcation involvement and was primary periodontal lesion with secondary endodontic involvement. Treatment included scaling, root planing & curettage and root canal treatment of the involved tooth. Periodontal flap surgery was done with bone graft placement in the furcation area. **RESULTS:** Patient was evaluated after one year. Radiographic examination showed healing of furcation defect as well as resolution of periapical inflammation. Clinical evaluation revealed resolution of furcation involvement as well as reduction of tooth mobility.

**Keywords:** Periodontal abscess. Endo-periodontal lesion. Furcation defects. Bone grafts.

### Resumo

**OBJETIVOS:** Apresentar um caso de comprometimento grau II de furca, lesão primariamente periodontal com comprometimento endodôntico secundário, em primeiro molar inferior. O tratamento constituiu de alisamento radicular, curetagem e tratamento endodôntico do dente comprometido. Cirurgia de retalho periodontal foi efetuada, com colocação de enxerto ósseo

na área da furca. **RESULTADOS:** o paciente foi avaliado após um ano, sendo que a imagem radiográfica demonstrou cicatrização do defeito da furca, bem como resolução da inflamação periapical. A avaliação clínica demonstrou resolução da lesão da furca, bem como redução da mobilidade dentária.

**Palavras-chave:** Abscesso periodontal. Lesões endo-periodontais. Defeitos de furca. Enxertos ósseos.

## INTRODUCTION

Periodontal abscess is the third most frequent dental emergency (1). It is defined as a localized purulent infection within the tissue adjacent to the periodontal pocket that may lead to the destruction of periodontal ligaments and alveolar bone (2). In periodontitis, a periodontal abscess represents a period of active bone destruction, although such events also occur without abscess formation (1). Often it is difficult to differentiate the cause of an abscess, as it may be of pulpal or periodontal origin. These conditions have to be promptly managed, failure of which could lead to tooth loss.

Abscesses are frequently found in furcations and management of periodontal abscess has been a challenge for many years. For example, in 17<sup>th</sup> century, Louis XIV of France was treated for his periodontal abscesses with masses of mixed bread and milk, in order to soften the swelling and to allow drainage of the abscess (1). The treatment of acute periodontal abscess usually includes two stages: the management of acute lesion; and the appropriate treatment of the original or residual lesion, once the acute situation has been controlled (3).

Pulpal and periodontal problems are responsible for more than 50% of tooth mortality (4). The effect of periodontal disease on dental pulp was first described by Turner & Drew in 1919. The relationship between periodontal and pulpal disease was first described by Simring and Goldberg in 1964 (5). Since then the term 'endo-perio lesion' has been used to describe lesions due to inflammatory products found in varying degrees in both the periodontium and pulpal tissues. The major pathways for communication and therefore for extension of disease from a periodontal pocket to the pulp are through patent dentinal tubules, lateral canals and the apical foramen (4). According to the classification given by Simon, Glick and Franklin S. Weine (1972) (6) these lesions can be classified as:

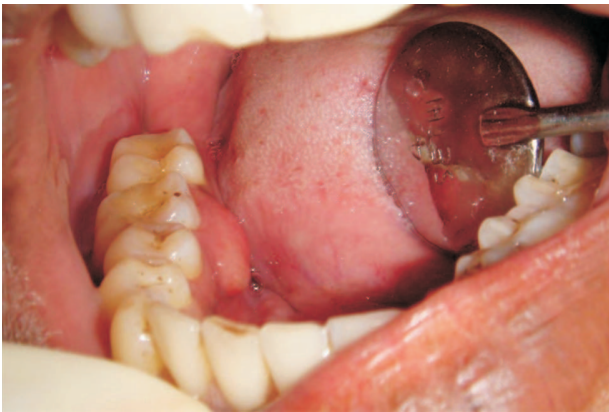
- 1) Primary endodontic lesions;
- 2) Primary periodontal lesions;
- 3) Primary endodontic lesion with secondary periodontal involvement;
- 4) Primary periodontal lesion with secondary endodontic involvement;
- 5) True combined lesions.

Regenerative treatments of furcation may be difficult because of complicated anatomy, inaccessibility of patient to the area, small size of furca foramen and accumulation of microbial plaque (2). Different regenerative treatments like bone graft (auto graft, allograft, xenograft and alloplastic materials) and guided tissue regeneration methods (resorbable and non resorbable membranes) have been used in periodontal defects.

The purpose of this article is to describe a case of periodontal abscess with grade- II furcation involvement, a primary periodontal lesion with secondary endodontic involvement and its management which involved an interdisciplinary approach of endodontic and periodontics.

## CASE REPORT

A 31-year-old male patient reported to the Outpatient Department of Periodontics, Darshan Dental College, Udaipur, with chief complaint of swelling of gums and discomfort in right lower back region. The swelling was present since the last four days. Oral hygiene status of patient was fair. Swelling was seen in relation to tooth 46 (Figure 1). Grade II mobility was evident in the 46, with pain and difficulty in mastication. Tooth was tender on percussion and vitality test was negative. Periodontal examination revealed a clinical probing pocket depth of 4 to 7 mm (mean 5.5 mm), with class II furcation involvement as measured with a Naber's probe (Figure 2). Intra oral periapical radiograph revealed periapical radiolucencies in distal root and furcation area of 46 (Figure 3).



**Figure 1** - Periodontal abscess in relation to 46



**Figure 2** - Furcation involvement in relation to 46



**Figure 3** - Radiograph showing radiolucency in furcation and distal root periapical area

Emergency treatment included drainage of the abscess with prescription of antibiotic regimen (Ornidazole™ 500mg & Ofloxacin™ 200 mg combination) and analgesic Diclofenac™ sodium 50 mg twice a day for five days. Patient was reevaluated after five days, as the swelling and inflammation subsided; root canal treatment was initiated at the second appointment (Figure 4). After evaluation of

Phase I therapy, periodontal regenerative procedure using alloplastic osteoconductive bone graft material was instituted. Biograft HT™ was selected as the material of choice because of its unique combination of hydroxyapatite and  $\beta$ -tricalcium phosphate combination. Under local anesthesia, a full thickness mucoperiosteal flaps were elevated (Figure 5). On surgical debridement, a Grade II furcation involvement was evident which was filled with the Biograft- HT™ bone graft material (Figure 6). Flaps were sutured with 4-0 black silk sutures and periodontal dressing was applied and post operative instructions were given. Post operative healing was good with minimal discomfort. Post operative medications included analgesic Diclofenac sodium 50 mg twice a day for five days. Post operative healing was satisfactory. Follow up was done for one week, one month, three months, six months and 12 months.

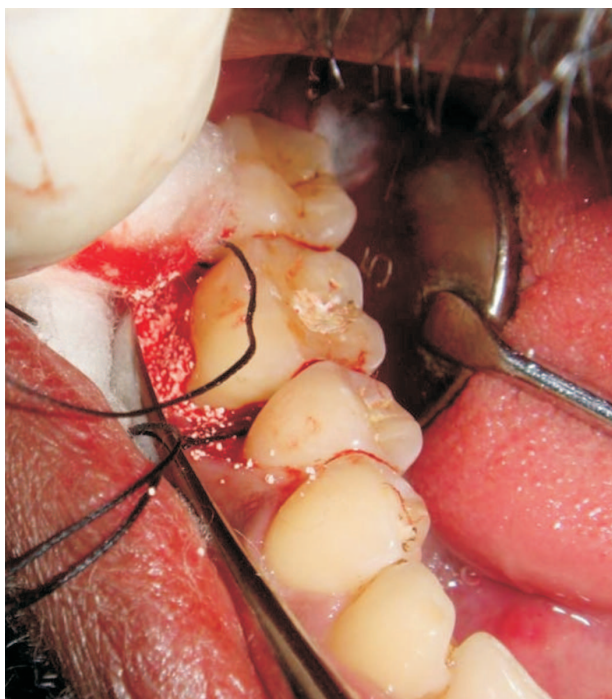


**Figure 4** - Image after root canal treatment



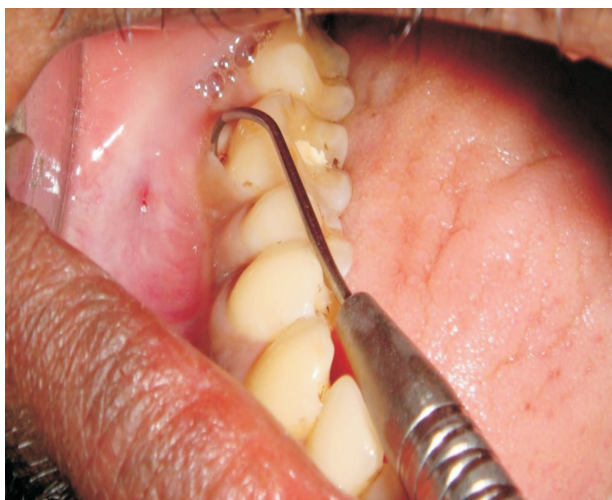
**Figure 5** - Surgical exposure of 46 after RCT



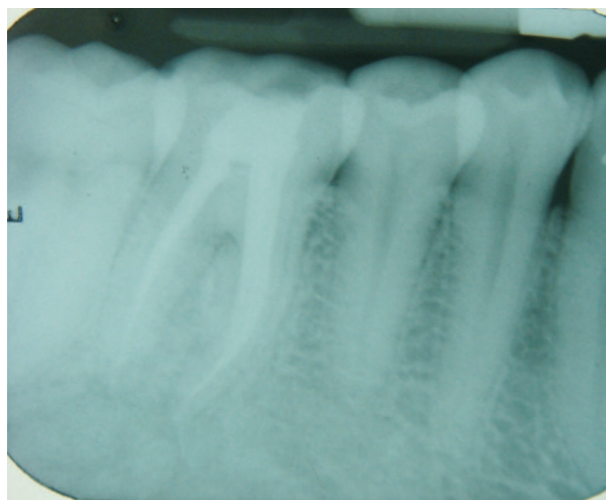


**Figure 6** - Placement of Biograft HT™ in the furcation defect area

Recall appointments consisted of reinforcement of oral hygiene instructions, scaling if required and periapical radiographs of the involved tooth. Patient revealed no bleeding on probing, no suppuration or episode of abscess and no mobility of tooth (Figure 7). The radiological evaluation revealed increased bone density in the periapical and furcation area after one year (Figure 8). Indicating successful resolution of infection and bone fill in the residual defect of furcation.



**Figure 7** - Clinical furcation probing after 1 year



**Figure 8** - Image of 46 after 1 year showing bone healing in the furcation and periapical area of distal root

## DISCUSSION

Diagnosis of a periodontal abscess is primarily based on the symptoms presented by the patient and the signs found during oral examination, careful medical and dental history and radiographic examination (6). Symptoms range from light discomfort to severe pain, tenderness of gingivae, swelling, tooth mobility, tooth elevation, sensitivity of the tooth to palpation. Suppuration either spontaneous or after pressure on abscess, combined with rapid tissue destruction and deep pocket formation can be seen (7). Radiographic examination may reveal a normal appearance or some degree of bone loss, ranging from a widening of periodontal space to a dramatic radiographic bone loss.

The entry of bacteriae into the soft tissue pocket wall could be the first event to initiate the periodontal abscess. Inflammatory cells are then attracted by chemotactic factors released by the bacteria, and the concomitant inflammatory reactions leads to destruction of the connective tissues, the encapsulation of the bacterial infection and the production of pus. The microflora related with periodontal abscess is complex, dominated by Gram negative, strict anaerobe rods. *P. gingivalis*, *P. intermedia* and *F. nucleatum* are the prevalent bacterial species (8, 9).

Management of periodontal abscesses recommended protocol (1) is: drainage through the pocket, or stab incision to the most fluctuant area. After one week the definitive treatment

could be carried out. In the treatment of a periodontal abscess associated with furcation involvement, therapy for the furcation should commence quickly and definitively following reappraisal of the periodontal damage after the relief of pain and swelling, that is, emergency management of the infection (10). Clinical tests are imperative for obtaining correct diagnosis and differentiating between endodontic and periodontal disease. Treatment, decision making and prognosis depend primarily on the diagnosis of the specific endodontic and/or periodontal disease. The main factors to be considered are pulp vitality and type and extent of the periodontal defect (6).

The tooth with a necrotic pulp may pose as a risk factor in initiation of periodontal disease. A periodontal–endodontic combination problems are much more frequent in posterior teeth, particularly in molars than anterior teeth because of greater number of auxiliary and furcation canals present in molars. Vertucci and Williams reported that 46% of mandibular first molars had auxiliary canals in furcation region (9).

The management of class II furcation involvement presents a unique clinical problem. Reasons for compromised results in furcation areas include the lack of proper access for instrumentation as well as for proper maintenance care due to the complex furcation anatomy and consequently a persistence of pathogenic microflora. The early work concentrated more on resective procedures intended to eliminate the pocket by furcationplasty and root resection. The most favorable outcome of any furcation therapy would be the regeneration of the lost attachment apparatus, which would result in the closure of the furcation. The various regenerative approaches utilized in the management of class II furcation involvements include root surface biomodification, coronally positioned flaps, the use of various bone replacement grafts, and Guided Tissue Regeneration procedures (2).

According to Weine (9), if a patient with open or closed furcation area displays the classic symptom of pulpitis, despite the absence of decay or extensive restorations, an endodontic procedure must be considered until another logical alternative is discovered. As the tooth involved was non-vital endodontic treatment was carried out so that bacteria are eliminated from the root canal system by mechanical instrumentation and irrigation with

normal saline and sodium hypochlorite substantially decreased the amount of bacteria in pulpal spaces.

In the present case the pulp was non-vital and radiological evaluation revealed periapical radiolucencies in relation to distal root and in furcation area. There was no evidence of carious lesion on the involved tooth, so the lesion was diagnosed as primarily periodontal lesion with secondary endodontic involvement. Treatment of the residual lesion caused by periodontal abscess was treated by using bone graft which was a combination of hydroxyapatite and beta – tricalcium phosphate.

Similar evidence of successful treatment of class II furcations using porous hydroxyapatite has been documented earlier also which was substantiated by improvements in clinical linear measurements and reentry evidence of incorporation of the implant in the surrounding bone (11).

## CONCLUSION

Endodontic-periodontal lesions present a diagnostic and treatment dilemma. Pathologic changes in endodontic and periodontal tissues affect each other. Pulp necrosis is a risk factor that damages adjacent periodontal structures. Primary periodontal diseases with secondary endodontic involvement require both endodontic and periodontal therapies. Their prognosis depends primarily upon the severity of the periodontal disease and the response to periodontal treatment. The suggested treatment of periodontal abscess with Grade-II furcation by root canal treatment followed by periodontal flap procedure with bone graft placement in the furcation of the involved tooth could result in complete healing of tooth which was considered hopeless.

## CONFLICT OF INTEREST STATEMENT

The authors declared no conflict of interest in the present manuscript.

## INFORMED CONSENT STATEMENT

The patients signed an informed consent, kept in the records, in the archives of the Dashan Dental College.

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