

# Palatal Root Resection of maxillary 1st molar — A Case Report

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## ABSTRACT :

One of the most challenging problems in periodontal therapy is management of multi-rooted teeth with an endo-perio lesion involving the inter-radicular bone. Despite the dilemma of whether to treat or extract, it is known that root resection has been used in advanced periodontal disease over 100 years. This treatment modality though is technically demanding, has often been the treatment of choice for class II and class III furcation involvement when tooth in question has a high strategic value. Root with the greatest bone loss is often considered for amputation. The most commonly performed root resection is the disto-buccal root of maxillary first molar but when both mesio-palatal and disto-palatal furcations are involved; with an intact buccal furcation, palatal root amputation is considered. Presented here is a case of primary perio secondary endo lesion of a 38 year old male. The case was diagnosed based on clinical and radiological findings and was managed with root canal therapy followed by palatal root resectioning with prosthetic rehabilitation.

## Introduction

The prime goal of dentistry is to retain teeth in symptom and disease free state for the life of the patient. In circumstances when the tooth supporting structure becomes compromised in the multi-rooted teeth, the decision to retain the tooth by endodontic therapy and periodontal intervention or extraction and subsequent replacement of teeth with implant is of prime importance.

Root resection is the process by which one or more of the roots of a tooth are removed at the level of the furcation while leaving the crown and remaining roots in function.<sup>1</sup> Magitot in 1867 was the first to report on the complete removal or amputation of molar roots<sup>2</sup>. However, Farrar et al. in 1884 was the first to detail the respective techniques for root-resection procedure<sup>3</sup>, which is now widely used to treat class II and III furcation-involved molars. The anatomy of the furcation area limits accessibility for professional as well as personal care. Root resection therapy provides a favorable environment for oral hygiene for patients as well as clinicians. However, a proper tooth selection is important for the success of the procedure.

Root resection is one of the treatment modality in cases of periodontic-endodontic lesions. Root resection may be carried out as vital or non-vital procedures. However, it is preferable to have endodontic therapy completed before resection of a root.

Bassaraba et al. in 1969 summarized indications for root resection<sup>4</sup> as,

- Teeth that are of critical importance to the overall dental treatment plan
- Teeth that have sufficient attachment remaining for function
- Teeth for which a more predictable or cost-effective method of therapy is not available
- Teeth in patients with good oral hygiene and low activity for caries are suitable for root resection.

Root with the greatest bone loss is often considered for amputation. The most commonly performed root resection is the distobuccal root of maxillary first molar, but when both mesial and distal furcation is

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Fig. 1

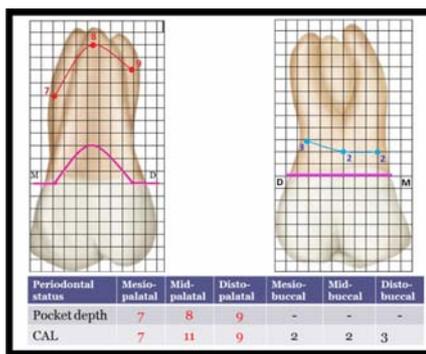


Fig. 2



Fig. 3



Fig. 4

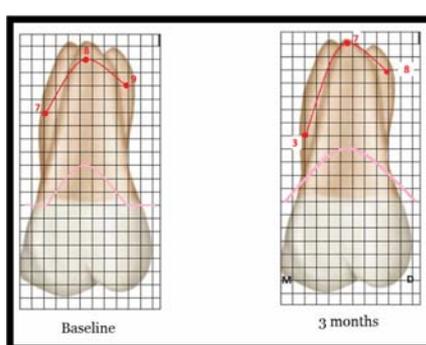


Fig. 5



Fig. 6

involved; with an intact buccal furcation, palatal root amputation is considered.<sup>5</sup>

### Case Report:

A 38 year old male patient reported to the department of Periodontics, Vydehi Institute of Dental Sciences and Research Centre with a chief complaint of sharp, continuous pain in relation to upper left back tooth since 5 months which aggravated on mastication. Patient gave a history of forceful wedging of hard food substance in relation to that region 5 months ago. He also observed erythema and swelling which was associated with bleeding while brushing.

On intra-oral hard tissue examination no caries was seen in relation to the maxillary left posterior region. Soft tissue examination revealed gingiva on the palatal surface of 26 appeared red and erythematous with exudation and bleeding on probing (fig 1). Periodontal examination revealed an 8-9mm deep periodontal pocket in relation to the palatal surface of 26 with clinical attachment loss (CAL) of 9-11 mm however; there was no periodontal pocket or CAL in relation to the buccal side (fig 2). Grade I mobility and class III furcation involvement in relation to mesio-palatal and disto-palatal furcations of 26 was seen.

Radiographic examination revealed diffused radiolucency in relation to palatal root of 26 and the furcation area suggesting furcation involvement (figure 3). Vitality test showed that 26 was non-vital. Based on clinical and radiological findings the case was diagnosed as primary perio secondary endo lesion in relation to 26.

It was decided to treat the case with emergency access opening in relation to 26 followed by scaling, root planing and endodontic therapy. 3 months, following endodontic therapy intra-oral examination revealed that gingiva was firm and resilient with no bleeding on probing (fig 4). Periodontal examination showed persistent periodontal pocket of 7-8 mm with a loss of attachment of 10-11 mm (fig 5).

After adequate local anesthesia, a periodontal flap surgery was performed to gain access to the palatal root. On reflection of a full thickness mucoperiosteal flap remaining bone was found to be at apical third of the palatal root of 26 (figure 6) and buccal bone was found to be intact (fig. 7). Hence, it was decided to amputee the palatal root of 26. Root resection was performed using tapered carbide bur with a continuous water spray, roof of the mesio-palatal and disto-palatal furcations were used as a guide for resection. The cut


**Fig. 7**

**Fig. 8**

**Fig. 9**

**Fig. 10**

**Fig. 11**

**Fig. 12**

**Fig. 13**

**Fig. 14**

**Fig. 15**

was made from the disto-palatal to the central portion of the furcation and continued to the mesio-palatal region (fig. 8). Once the root was removed a periodontal probe was walked through the area of resected root to ensure fine margins (fig. 9).

It was decided to use an alloplastic graft for filling the bone defect following removal of the palatal root and hence Bio-Graft HA was mixed with saline and gently packed into the defect (fig. 10), interrupted loop sutures were placed followed by placement of periodontal pack. A 5 day course of amoxicillin 500 mg 3 times a day and a 3 day course of Diclofenac sodium 50mg 2 times a day were prescribed along with post-operative instructions. 1 week post operatively healing was found to be uneventful (fig. 11). Suture was removed 14 days after the surgery.

After 3 months following root resection the tooth was re-evaluated for mobility, adequate soft tissue adaptation and healing, resected tooth margins were prepared for fixed prostheses (Fig. 12). A prosthetic rehabilitation of 26 was planned keeping in mind to shun the occlusal forces away from the mesio-palatal functional cusp of 26 by keeping the palatal cusps out of occlusion (Figs. 13& 14). Post treatment radiograph showed resolution of periapical radiolucency (Fig. 15).

### **Discussion:**

The case presented here is of a primary perio secondary endo lesion in relation to 26. Before selecting the tooth for root resection, patient's oral hygiene status, caries index and medical status were considered. Also the accessibility of root furcation

for ease of operation as well as good bone support in relation to remaining roots was assessed. The palatal aspect of the tooth showed bone loss but the buccal side was intact. Since there was considerable bone support on the buccal side it was decided to treat the tooth by palatal root resection based on *Bassarba et al.* criteria for root resection.<sup>4</sup>

It was also in accordance with *Minsk and Polson et al.* who suggested that root resection can be a valuable procedure when tooth in question has a high strategic value or when the specific problems cannot be solved through any other therapeutic approaches.<sup>6</sup>

Although dental implants are occupying the center stage in treatment planning, in the present case due to loss of bone till apical third in relation to palatal root of 26 the bucco-palatal width was compromised and would require augmentation of the ridge prior to implant placement. Moreover, Implants in the maxillary posterior region have the lowest success rate. Increased implant failure rates in the posterior maxilla have been related to the spongy bone quality frequently found in this area.<sup>7</sup> The alveolar bone height in the maxillary molar region is often reduced owing to vertical ridge resorption and the size of the maxillary sinus.<sup>8</sup>

Although failures have been reported by longitudinal studies of resected molars, they range from 7 to 38%. In a 10 year longitudinal study by *Carnevale et al* attention was paid to extensive periodontal maintenance practices following root resection. Patients were evaluated at 3, 5 and 10 years. For the experimental group with resections, 93% of teeth were retained throughout the evaluation period, with a failure rate of 7%. These high levels of success were attributed to the establishment of favorable tissue morphology during the surgical procedure and attention paid to oral hygiene practices and plaque control measures.<sup>9</sup>

*Blomlöf et al* reviewed the survival rates of resected molars in 80 patients. Evaluation parameters included conventional periodontal indices, radiographic examination, personal habits, and the design of restorations. 75% percent of the resected teeth were maxillary molars. The survival rates of the resected molars were 83% at 5 years and 68% at 10 years. Smokers demonstrated a significantly greater failure rate than nonsmokers.<sup>10</sup>

In another study Langer et al evaluated the results of root resections performed to eliminate periodontal pockets around teeth with furcation involvement. He found that significant 38% of teeth failed during a 10-year observation period.<sup>11</sup>

These longitudinal studies indicate a divergence of opinion on the effectiveness of root resection therapy. The differing success rates from one study to another are a result of a lack of consensus in the criteria used to evaluate treatment outcome.

Root resection therapy is still a valid treatment option for molars with furcation involvement. Root resection to treat periodontal problems have showed better prognosis than root resection for treating non-periodontal purposes. Periodontal problems around resected molars have a tendency to recur and should be maintained through meticulous supportive treatment

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