

## Root Resection of Maxillary First Molar: A Case Report.

Dr. Kamal Nabhi<sup>1</sup>, Dr. Pooja Mehra<sup>2</sup>, Dr. Bharti Sharma<sup>3</sup>

<sup>1</sup>Senior Lecturer In Department of Conservative Dentistry & Endodontics, Indian Institute Of Dental Sciences, Sehora, Jammu.

<sup>2</sup>Post Graduate In Department of Periodontics, Bhojia Dental College & Hospital, Baddi.(H.P)

<sup>3</sup>Post Graduate In Department of Conservative Dentistry & Endodontics, Himachal Dental College, Sundernagar.Mandi.(H.P)

---

**Abstract:** The increased desire of patients to maintain their dentition has forced dental specialist to conserve the teeth in the mouth which are planned to be removed. In the light of this finding it is known that periodontally compromised teeth with severe bone loss at furcation area or endodontically compromised teeth may well be retained of their roots. This type of surgical therapy enables clinicians to better access the remaining tooth structure for periodontal and subsequent prosthetic therapy. In this case report palatal root resection of the right first maxillary molar with a simple procedure is presented along with a brief review of root resection as a treatment modality.

**Keywords:** Root resection, furcation defects, endodontic therapy, Periodontitis.

---

### I. Introduction

“Root resection” is a 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>. Proper maintenance of molar teeth becomes problematic as apical migration of osseous supporting structures allows bacterial invasion of the furcation. Undeniably, untreated furcated molars will lead predictably to more bone loss.<sup>2</sup> Root Resection has been performed in dentistry since the late 1800s.<sup>3</sup> With proper long-term monitoring and maintenance, a root resection is accepted as a valid treatment with reasonable long-term effectiveness.<sup>4</sup> Root-resection therapy is a treatment option for molars with periodontal, endodontic, restorative or prosthetic problems.<sup>5</sup>

### II. Case Report

A 30 year old patient reported to the Department of Endodontics, at Bhojia Dental College and Hospital, with the complaint of throbbing pain and pus discharge in upper right posterior region of jaw since 2-3 months. Patient gave history of swelling and sinus with respect to maxillary first molar (16). The patient’s medical history was non-contributory. Intra oral examination showed generalized moderate periodontal pockets and tooth mobility. On radiographic examination, the OPG and periapical X- rays

[FIG.1&2] showed generalized bone loss and severe bone loss with palatal root of maxillary first molar with furcation involvement. Since mesiobuccal and distobuccal root showed adequate bone support it was decided to retain these roots and remove the distal root. Complete medical history of the patient was taken and was found to be noncontributory. Treatment plan and postoperative consequences were explained to the patient. An informed written consent was taken following which the patient was scheduled for a subsequent appointment. To begin with, a thorough phase I therapy was performed and surrounding tissue was assessed. Access opening was done and the endodontic treatment was completed in frequent visits. [FIG.3]



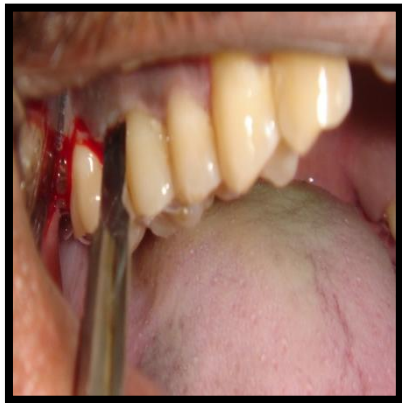
Fig 1: Diagnostic Opg



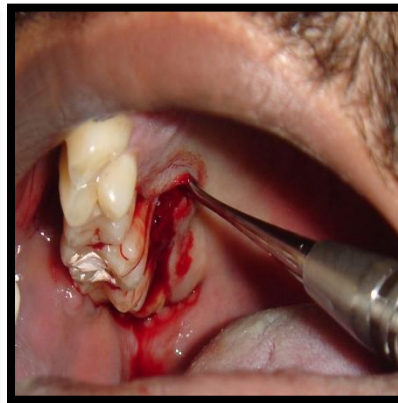
**Fig 2:** Diagnostic Iopa



**Fig3:** After Endodontic Treatment



**Fig 4:** After Incision



**Fig 5:** After Flap Elevation



**Fig 6, 7:** Separation Of Palatal Root



**Fig 8:** Separated



**Fig 9:** Surgical Site After

Palatal Root



**Fig 10:** Sutures Given

Extraction Of Palatal Root



**Fig11:** Suture Removal



**Fig 12:** Healing After Six Months



**Fig13:** Post Endodontic Restoration

A total of 1000 mg Amoxicilin (Novamox, Cipla Ltd., India) and 400 mg Ibuprofen (Flexon, Aristo Pharmaceutical Pvt Ltd., India) was given to the patient 1 h before the procedure to prevent infection, possible resorptive process and post-operative pain. The procedure was started by asking the patient to rinse with Betadine gargles (Win-Medicare Pvt Ltd., India) and proper schedule of surgical disinfection was followed. 2% lignocaine hydrochloride (Lignox 2%, Indoco-Remedies Ltd., India) was administered to anesthetize middle alveolar, posterior Superior Alveolar and greater palatine nerves. After appropriate local anesthesia, a full-thickness mucoperiosteal flap was elevated [FIG.4&5]. A removal of a small amount of facial bone was done to provide access for elevation and facilitate root removal. A cut was then directed just apical to the cemento-enamel junction of the tooth. This cut was made with a high-speed tapered fissure carbide bur. A curved periodontal explorer was used to aid in orienting the angle of the resection. The sectioned area was evaluated using a fine explorer. The palatal root was extracted from the socket, furcation area was trimmed for bony specules and area was inspected for any periodontal irritation .

Glass ionomer restoration (Fuji IX, GC, Europe), was used to seal the pulp chamber at the furcation area. The remaining roots were planned. The socket was irrigated with saline and the tooth was checked for occlusion to facilitate healing. The flap was repositioned and secured with 3-0 monofilament suture (Sutures India Pvt Ltd; India) . The patient was instructed to avoid the use of the operated side for few days, to have soft, lukewarm semi-solid diet and to perform daily rinse with 0.2% w/v chlorhexidine gluconate (Rexidin, Indoco-Remedies Ltd., India) twice a day till further instructions. Patient was put on Amoxicilin 500 mg (Novamox, Cipla Ltd., India) thrice a day, Metronidazole 400 mg (Metron, Ulticare-Alkem Laboratories, India) thrice daily and Ibuprofen 400 mg (Flexon, Aristo Pharmaceutical Pvt Ltd., India) thrice daily for 7 days. Sutures were removed after 7 days , healing was found to be satisfactory. The patient was periodically evaluated for prognosis and Post Endodontic Restoration was given.

### III. Discussion

Root resection procedures have long been used as a treatment modality in various clinical situations involving multirouted teeth.<sup>6</sup> Marshall - Day et al in 1955, also reported a rise in tooth mortality after age 40,

and the maxillary and mandibular molars were the earliest teeth lost.<sup>7</sup> An early study by Marshall-Day and Skourie in 1949, on radiographic examinations of 568 subjects in India, ages 9 to 60 years old, concluded that the mandibular incisors and molars appeared to be most susceptible to osseous loss.<sup>8</sup> According to Eastman and Backmeyer in 1986, this approach can be performed for endodontic, prosthetic and periodontal reasons, the latter accounting for 87% of the indications.<sup>9</sup> It is reported that furcation involvement occurs three times more frequently among maxillary than mandibular molars.<sup>10</sup>

In 1894, Dr. W J. Younger while addressing the meeting of the American Medical Association on “pyorrhea alveolaris” had said about the hopelessly involved roots of molar teeth: “My treatment in these cases has been to open into these roots, remove their pulps, fill them and amputate (the involved root), then grind away enough of the articulating surface of the crown, immediately over the removal root, in order to bring the pressure in the effort of mastication upon the (solid) roots. By these means, these teeth can be made comfortable and serviceable for years”.<sup>11</sup> In 1930, Coolidge emphasized the importance of a well sealed root canal prior to resection.<sup>5</sup> Later, Sommer in 2002, elaborated on the essentials for successful root resection and the role of proper root canal therapy in decreasing organisms and infection prior to root resection.<sup>11</sup>

Grossman in 2004, referred to root amputation as dental proof of the old adage that half a better than none. Root amputation and hemisection procedures were reported in the literature over 100 years ago.<sup>12</sup> Early in 1960's, the therapy involving root amputation was right on the cutting edge in periodontics and endodontics. ‘Hiatt’ and ‘Amen’ contributed in the quest for salvaging teeth by comprehensively describing the indications and techniques for root amputation.<sup>13</sup> In reality ‘G.VBlack’ described almost the same methods in the nineteenth century and by ‘Sharp’ in 1920.<sup>14</sup> Farrar in 1884 said that Root resection is one of the accepted surgical treatments for selected furcated molar teeth. A major complication for the successful management of furcated molars by either the periodontist or the patient is the complex anatomy of the interradicular aspect of the roots.<sup>15</sup> Bower in 1979, microscopically examined the furcations of extracted maxillary and mandibular molars. A random sample of first permanent molar teeth (114 maxillary and 103 mandibular teeth) were sectioned at right angles to the long axis at a level 2 mm apical to the most apical root division, and then examined using a dissection microscope. Maxillary first molars were concave in 94% of mesiobuccal roots, 31% of distobuccal roots, and 17% of palatal roots, and the deepest concavity was on the interradicular aspect of the mesiobuccal root; mandibular first molars were concave in 100% of mesial roots and 99% of distal roots, and the deeper concavity was found in the mesial root rather than the distal root.<sup>16</sup> Everett in 1958, described another anatomic feature of molar teeth that complicates optimal plaque removal— the bifurcational ridge. This structure is located at the junction between the fluting on the radicular and apical surfaces of the root trunk.<sup>17</sup>

Root resection is very technique sensitive and complex, so proper case selection is essential.<sup>18</sup> Root separation or resection has been used successfully to retain teeth with furcation involvement. However, there are few disadvantages associated with it. As with any surgical procedure, it can cause pain and anxiety. Root surfaces that are reshaped by grinding in the furcation or at the site of hemisection are more susceptible to caries. Often a favorable result may be negated by decay after treatment. Failure of endodontic therapy due to any reason will cause failure of the procedure. In addition, when the tooth has lost part of its root support, it will require a restoration to permit it to function independently or to serve as an abutment for a splint or bridge. Unfortunately, a restoration can contribute to periodontal destruction, if the margins are defective or if non-occlusal surfaces do not have physiologic form. Also, an improperly shaped occlusal contact area may convert acceptable forces into destructive forces and predispose the tooth to trauma from occlusion and ultimate failure of root separation and resection.<sup>19</sup> To achieve good results in periodontally diseased molars, > 50% bone support of the remaining roots at the time of the root resection is an important factor.<sup>20</sup> Periodontal problems around resected molars have a tendency to recur and should be maintained through meticulous supportive periodontal treatment. In addition, a careful prosthetic plan should be designed to avoid a fracture of resected molars related to biomechanic impairment.<sup>21</sup>

#### **IV. Conclusion**

Root-resection therapy is still a valid treatment option for molars with furcation involvement. Root resection to treat periodontal problems showed a better prognosis than root resection performed for non-periodontal purposes.<sup>1</sup> Root resection should be determined to retain and not remove the natural teeth. Also, medically compromised patients may benefit from the maintenance of existing roots, avoiding multiple reconstructive surgical procedures.<sup>21</sup>

#### **References**

- [1]. Park SY, Shin SY, Yang SM, Kye SB. Factors influencing the outcome of root- resection therapy in molars: A 10-year retrospective study. *J Periodontol* 2009;80:32-40.
- [2]. Sukant Sahoo, Karan Sethi, Prince Kumar, Aman Bansal. Management of periodontal furcation defects employing molar bisection; a case report with review of the literature. *Dental Hypotheses* 2013;4(3):1-5.

- [3]. Amen C. Hemisection and root amputation. *Periodontics*. 1966;4:197.
- [4]. Buhler H. Evaluation of root- resected teeth. Results after 10 years. *J periodontol*.1988;59:805-810.
- [5]. Mantri V, Maria R, Kamat S, Raut AW. Root amputation: Case Reports and review. *Endodontology*. 2013;25(2):89-96.
- [6]. Green EN. Hemisection and root amputation. *J Am Dent Assoc* 1986;112: 511-518.
- [7]. Marshall-Day CD, Skourie KL. A roentgenographic survey of periodontal disease in India. *J Am Dent Assoc* 1949;39:572.
- [8]. Marshall-Day CD, Septhens RG, Quigley L. Periodontal disease:Prevalence and incidence. *J Periodontol* 1955;26:185.
- [9]. Eastman JR, Backmeyer J. A review of the periodontal, endodontic and prosthetic considerations in odontogenous resection procedures. *Int J Periodontics Restorative Dent* 1986; 6(2):34.
- [10]. Seina Majzoub, Simao Kon. Tooth morphology following root resection procedures in maxillary first molars. *J Periodontol* 1992;Apr: 290 – 296.
- [11]. John I Ingle and Leif K Bakland. *Ingle’s Endodontics*, 5th edition; B. C. Decker Inc. 2002: 722-727.
- [12]. Franklin S. Weine. *Endodontic therapy*, 6th edition; Mosby Inc. 2004:423-451.
- [13]. Mehmet Dalkiz. Bicuspidization : A Case Report *OLGU SUNUMU* 2008; 50 : 42-45
- [14]. Parmar G., Vashi P. Hemisection: A Case Report and Review, *Endodontology* 2003;15:26-29
- [15]. Farrar JM. Radical and heroic treatment of alveolar abscess by amputation of roots of teeth. *Dental Cosmos* 1884;26:79.
- [16]. Bower R. Furcation morphology relative to periodontal treatment. *J Periodontol* 1979;50:366–374.
- [17]. Everett FB. The intermediate bifurcational ridge: A study of the morphology of the bifurcation of the lower first molar. *JDent Res* 1958;37:162.
- [18]. DeSanctis M, Murphy KG. The role of resective periodontal surgery in the treatment of furcation defects. *Periodntal* 2000;22:154-168
- [19]. Kinsel RP, Lamb RE. The treatment dilemma of the furcated molar: root resection versus single-tooth implant restoration. A literature review. *Int J Oral Maxillofac Implants*.1998 ;13:322-332.
- [20]. Butt N & Talwar S. Root resection in maxillary molar with a retained fractured instrument and periodontal defect. *Indian J Dent Adv* 2014; 6(2): 1546-1549.
- [21]. Javali MA, Safeena, Ayesha H. Root Resection of Maxillary First Molar: A Case Report. *Heal Talk*. 2012; 4(4) : 20-21.
- [22]. Legends
- [23]. FIG 1: Diagnostic Opg
- [24]. FIG 2: Diagnostic Iopa
- [25]. FIG3: After Endodontic Treatment
- [26]. FIG 4: After Incision
- [27]. FIG 5: After Flap Elevation
- [28]. FIG 6, 7: Separation of Palatal Root
- [29]. FIG 8: Separated Palatal Root
- [30]. FIG 9: Surgical Site after Extraction of Palatal Root
- [31]. FIG 10: Sutures Given
- [32]. FIG11: Suture Removal
- [33]. FIG 12: Healing after six months
- [34]. FIG13: Post Endodontic Restoration