International Journal Dental and Medical Sciences Research
Volume 4, Issue 3, May-June 2022 pp 416-418 www.ijdmsrjournal.com ISSN: 2582-6018

Hemisection: every tooth has a silver lining

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Submitted: 05-06-2022 Accepted: 20-06-2022

ABSTRACT
Increased desire of patients to maintain their natural dentition along with the advances in dentistry have showed the path to various treatment options for teeth that would have been extracted once. Mandibular first molars are the major standpoint for occlusion and hence should be saved as much as possible extracting only the diseased part. This case report highlights one such way of preserving the tooth with endodontic failure by removing only the compromised root and crown portion known as hemisection and preserving as much tooth structure as possible.

Keywords: hemisection, mandibular first molar, retreatment

I. INTRODUCTION

The desire to preserve the natural dentition has increased as the patients have become more aware about their oral health[1]. Preservation of sound tooth structure and restoration of function is of utmost importance when retention of the entire tooth structure is impossible due to advanced periodontal disease, carious lesion or endodontic failure.[2,3] Conservative dentistry aims to preserve as much tooth structure as possible rather than sacrificing the whole tooth[4]. Hemisection is the procedure involving sectioning of a mandibular molar into two halves followed by removal of the diseased root and its coronal portion.[5] The procedure is only indicated if the remaining root has adequate periodontal support and the crown can be restored. The distal root is generally more conical in shape and is easier to restore and maintain.[6] Loss of the posterior teeth is eventful and undesirable often leading to teeth drifting, loss of masticatory function and loss of arch length, which requires prevention and maintenance measures.[7]Hemisection seems to be a reliable treatment option for saving a non-restorable molar which otherwise needs to be extracted. Although there are many case reports present in literature for hemisection of periodontally weakened tooth but there is scant information related to saving a tooth with endodontic failure. This case report leads to a way for conservation of as much tooth structure possible for a hopeless tooth after failure of endodontic retreatment attempt.

II. CASE REPORT

A 23 year old male patient reported to department of conservative dentistry and endodontics, Vyas Dental College and Hospital, Jodhpur, with chief complaint of pain in root canal treated tooth and initiated retreatment with the same tooth. Patient's medical history was non-contributory and the extraoral findings were within normal limits. The tooth was tender to percussion and radiographic examination revealed a radiolucency associated with mesial root of the mandibular molar in which retreatment has been already started(Fig 1). Periodontal support of the tooth was good. The access opening was modified, working length determined(Fig 2) and drainage was established from the mesial root. The canals were cleaned and shaped with NiTi rotary files (Protaper gold, Dentsply Maillefer, Ballaigues, Switzerland). Irrigation was performedusing 5.25 % sodium hypochlorite and normal saline followed bycalcium hydroxide dressing and patient was recalled after 7 days. On recall visit, pain and swelling was present in relation to the mandibular molar and no relief was reported. Various treatment options were considered like extraction of tooth followed by implant, bridge prosthesis on premolar and mandibular second molar. The patient did not wish to have the tooth removed, so conservative treatment was selected, which included hemisection of the mesial root of 36, save as much tooth structure as possible followed by prosthetic replacement. The whole procedure was explained to the patient. Master cone was selected (Fig 3) and obturation was done in the distal root only using gutta-percha with calcium hydroxide based root canal sealer. Intraoral swelling did not subside during the root canal treatment(Fig 4). The vertical cut method was used to resect the crown using a long shank tapered fissure carbide bur(Fig 5). Access was gained to the bifurcation area through the buccal side with the help of slow speed handpiece under abundant coolant. To be ensured about the separation, a fine probe was passed through the cut. After completion of the sectioning, the mesial root was elevated from its socket using a periosteal elevator and removed(Fig 6). Granulation tissue was curetted out of the mesial socket using surgical curettes. The socket was irrigated adequately with sterile normal saline to

remove any bony chips if present. Antibiotics and analgesics were prescribed for one week. Satisfactory healing was noticedat a follow-up appointment one week later(Fig 7). When the patient returned after one month, patient was completely asymptomatic. Clinically, satisfactory healing was noticed at the extracted socket. Final prosthesis was fabricated i.e. fixed bridge involving retained distal root and mandibular second premolar(which was already root canal treated)(Fig 8 and 9). Patient was followed up by regular recall visits and oral prophylaxis. He was satisfied with the treatment outcome and had a good masticatory efficiency with the prosthesis.

III. DISCUSSION

With recent advancements in endodontics, periodontics and restorative dentistry, hemisection has gained acceptance as a conservative dental treatment for a hopeless tooth. This article presents a technique to retain sound tooth structure in a compromised tooth. The long term prognosis for teeth with hemisection will depend on many factors like the quality of root canal therapy in the retained root, the contouring and quality of the final restoration, and the ability to maintain the health of supporting periodontal soft and hard tissues.[6] Bone loss caused by pulpal disease is reversible, whereas, advanced bone loss caused by periodontal disease is usually irreversible[8]. Hemisection as a treatment option was perfectly suited for this case. The patient wished to conserve as much tooth structure as possible. Affected teeth with spread apart roots facilitate the clinician's ability to carry out hemisection. Teeth in which closely approximated or fused roots are present are not good choices forhemisection therapy.[4] In the present case, the above mentioned indication for case selection in performing hemisection was optimum as the roots were not closely approximated or fused.Appropriate endodontic therapy must be performed before hemisection to avoid intrapulpal dystrophic calcification and postoperative tooth sensitivity.[9] Hence, the use of hemisection to retain a compromised tooth presents a prognosis which is comparable to any other tooth undergoing endodontic treatment for facilitating the prosthesis. Shafiq et al. have also put forward that hemisection of a mandibular molar offers a suitable treatment option when the decay is restricted to one root, the other root being healthy and remaining portion of the tooth can very well act as an abutment.[10] The decision regarding the treatment option must be based on the patient's age, medical history, and the ability to maintain oral hygiene. Consideration of the cost of treatment and available clinical evidence of success of different treatment modalities is indispensable[11].

In the present case, all possible treatment options were explained to the patient, including hemisection, as the decay was limited to mesial root. Since the patient was young, he was reluctant to lose his tooth. In addition, his financial conditions made him to reject the option of dental implant. Fugazzottoreported that cumulative success rates were 96.8% for root-resected molars while 97.0% for molar implants and concluded that both molar root resection and molar implant placement with appropriate restoration demonstrated a high degree of success in function.[12]

IV. CONCLUSION

The keys to long term success of hemisected teeth appear to be thorough diagnosis, selection of patients with good oral hygiene, careful surgical and restorative management. Hemisection is an alternative, effective, and conservative treatment modality over conventional procedure or extraction of periodontally and endodontic affected teeth which reduces the financial burden, psychological trauma and occlusal dysfunction.

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