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Hemisection: A conservative approach for the management of periodontally involved tooth : A Case Report

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Abstract

Hemisection is sectioning of multi-rooted teeth with its crown portion, with the loss of periodontal attachment and is performed to retain the original tooth structure and attain the fixed prosthodontic prosthesis. It can be essentially used for the management of compromised tooth due to caries, resorption, non negiotiable canal, perforation, periodontal damage, which is restricted to single root.

Introduction

With advancements in technology minimal invasive approaches are gaining popularity. Aim of this treatment modality is to preserve as much as natural dentition as possible. As no man- made materials can replace original tooth structure, it is very essential to preserve the same.Thus,main aimof root resection procedure is to preserve the remaining tooth structure and restoration of the function.Loss of the posterior teeth can result in several cosequences which requires prevention and maintenance measures. [1] The term "hemi section" or "root amputation" are synonyms for "root sectioning" or "bisection" and is a treatment modality, which allows the preservation of tooth structure, alveolar bone and cost savings over other treatment options.[2]With proper case selection, hemisection can be considered as an excellent treatment option, as it can provide relatively simple, inexpensive,conservative treatment with good chances of success.[3]This case report presents the management of periodontally compromised mandibular second molar using hemisection.

Case report

A 45 year old male patient reported to our department with chief complaint of pain in lower right back tooth region. Pain was mild, intermittent , which aggrevated on mastication. On clinical examination, tooth was tender on percussion and class 3 furcation involvement was seen.There was no caries and mobility associated with the same tooth.On radiographic examination severe bone loss was detected in the distal root of 46.Mesial root was found to be intact. It was decided to resect the distal root after endodontic therapy of the respective tooth followed by placement of PRF with bonegraft.The procedure was initiated by anaesthetizing by inferior alveolar nerve block. Acess caviy was prepared with round bur and endo z bur. After determining the working length cleaning and shaping was performed using neo endo rotary files. Intra

canal dressing of calcium hydroxide was placed and recalled after 5 days. On the next appointment patient was completely asymptomatic.The canals were then obturated using gutta-percha, followed by coronal restoration with resin composite. Patient was recalled after 2 days. After anesthetization, a long shank tapering fissure bur was used to section the first molar. The tooth was then sectioned into two (mesial and distal) halves, and the distal half was extracted out of the socket using a tweezer. The mesial half was contoured, and the area was irrigated with normal saline.PRF was made from patient's blood which was then mixed with bone graft material and placed in to the extracted socket. A membrane was made using PRF, which was then placed above it and suture was placed. The sutures were removed after an observational period of 1 week.

Fig 1: Pre-operative

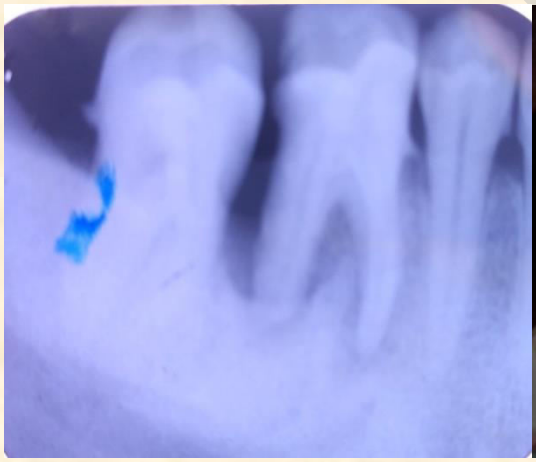


Fig 1.1

Fig 1.2

Fig 2 : After obturation

Fig 3 : After sectioning of the tooth

Fig 4: After removal of sectioned segment

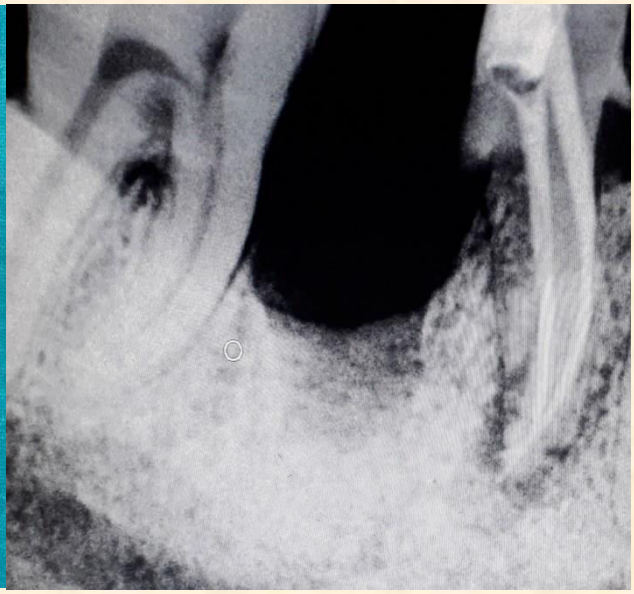


Fig 5: After hemisection

Fig 6 : Blood drawn from patient

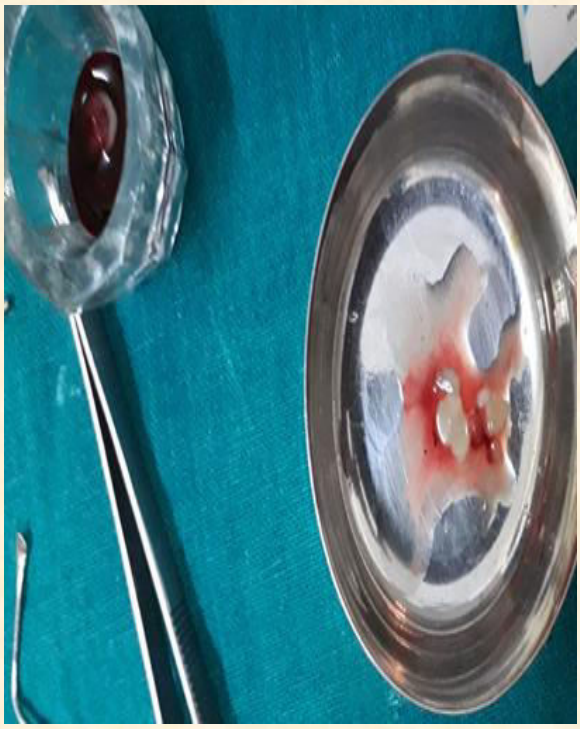
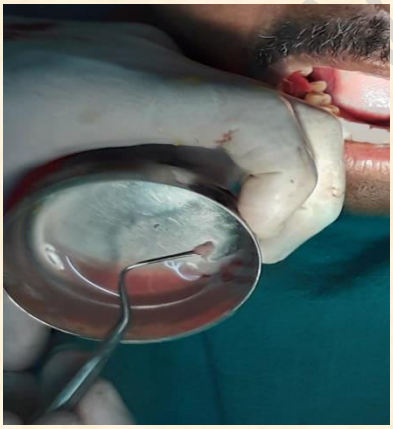


Fig 7 : PRF

Fig 8: Mixing of PRF with bone graft



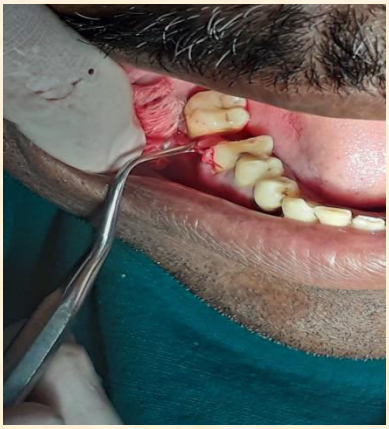


Fig 9 : PRF with bone graft placement

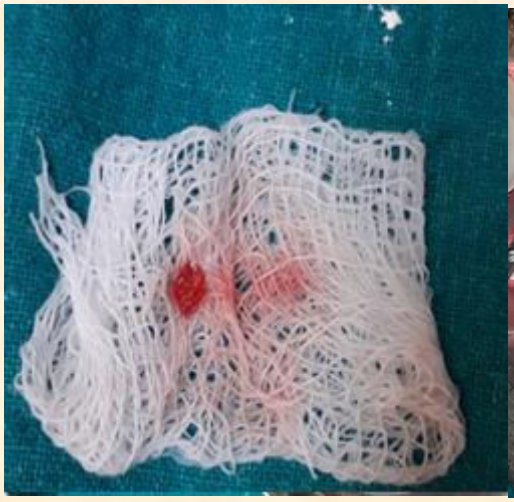


Fig 10: Prepared membrane

Fig 11: Placement of membrane

Fig 12 : After suture placement

Fig 13 : After suture removal

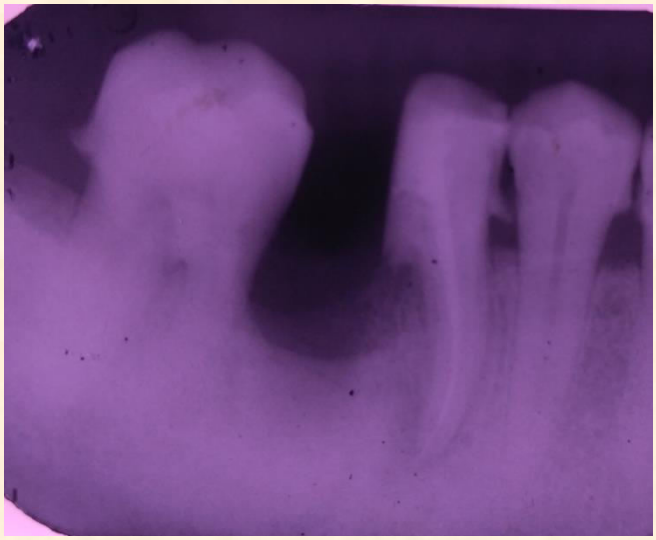


Fig 14 : After 1 month

Discussion

Hemisection: The surgical separation of a multi-rooted tooth through the Furcation in such a way that a root and the associated portion of the crown may be removed.One-half of the tooth is saved so that it can be used as an abutment to provide permanent prosthesis to restore function and aesthetics.[4]It is usually performed on mandibular molars where either the mesial or the distal half can be preserved. So hemi-section is always thought as the last of all the treatment modalities.Hemisection of mandibular molar can be thought as a feasible treatment modality when one root has poor treatment prognosis, and the other root is healthy and that portion of tooth can be used as an abutment.[5]In the present case there was severe bone loss in distal root along with class 3 furcation defect and mesial root was healthy and comparatively less bone loss.[6] Several adjuncts can be tried to accelerate the process of bone healing following tooth extraction. Platelet rich fibrin (PRF) is one such autologous material, which was first described by Choukroun in 2001.PRF is an autogenous graft material which has tremendous potential whenever used for regenerative procedures. It contains growth factors and cytokines that plays a key role to combat inflammation and aids in bone healing.[7] It helps in faster healing of the hard tissues like bone by remediating healing process than in regular conditions. It can also act as a scaffold or matrix for regeneration of bone cells. Platelet based growth factors induce regeneration of bone and promote healing. It is a second generation autogenous graft, which can be obtained chair-side and has better patient compliance.Root fracture is the main reason for failure after hemisection, so occlusion modifications are always required.[8]Occlusion contacts has to be positioned more favorably. In this case, lateral forces were counteracted by making cuspal inclines less incline. According to Shin-Young Park, resected molars used as intermediate abutments of a fixed bridge, had a

higher survival rate, this might be because the occlusal loads on the intermediate abutment are smaller than on terminal abutments and single abutments.[9]For the long term success, amount of occlusal forces is significant factor, and root fractures were frequently reported in resected molars with higher occlusal loads.Bhuler (1988) observed 32% failure rate in hemisection case due to endodontic pathology and root fracture while long-term studies have shown greater success. Thus, hemisection can be used as an excellent treatment option for the conservative management, which not only helps to preserve the tooth but also reduce the financial burden, psychological trauma and occlusal dysfunction.[10]

Conclusion

Hemisection helps in conserving the natural dentition. So it can be used as an alternative, effective, and conservative treatment modality over conventional procedure or extraction of periodontally and endodontic affected teeth.

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