Split and Preserve -A Case Report

Karan Khurana[1], Akriti[2,*], Dildeep Bali[3], Vijaya Dhar[4], Prashant Bhasin[5], Era Arora[6]

Department of Conservative Dentistry, Santosh Dental College, Santosh University, Ghaziabad

***Corresponding Author:**
Email: sahayaakriti05@gmail.com

ABSTRACT

Hemisection refers to sectioning of a mandibular molar into two halves followed by removal of the diseased root and its coronal portion. It can only be carried out in teeth where periodontal destruction has only affected one root and the treatment modality is beneficial to an overall treatment plan. This case reports a 26-year-old male patient who came to the Department Of Conservative Dentistry And Endodontics at Santosh Dental College Ghaziabad, with the chief complaint of pain in the Right lower back region since 2 weeks. Radiographic examination revealed themesial root with a broken instrument beyond the apex in the mesiolingual canal. It was decided to partially preserve the tooth by carrying out hemisection by removing the mesial root. The distal canal was obturated following restoration with post and core. After a 6-month routine follow up the periodontal apparatus and periapical tissues seemed to be normal with periapical healing i.r.t tooth no 47.

Keywords: *Hemisection, Instrument separation, Success rate, Ultrasonics*

INTRODUCTION

Present day clinicians are well aware that "The naturally retained root is the ultimate dental implant." Hemisection is a corrective surgical procedurespecially designed to correct pathologic or iatrogenic entities.It refers to sectioning of a mandibular molar into two halves followed by removal of the diseased root and its coronal portion.[1-3]

Indications: Following are the indications for performing hemisection[4]-

- Severe marginal periodontal disease around an entire root in a multi-rooted tooth, resulting in deep periodontal pocketing
- Caries preventing the restoration of root
- Pathologic root resorption
- Vertical root fracture
- Perforation
- File breakage
- Previous apical surgery resulting in tooth becoming untreatable
- Mesio-distal fracture of a maxillary molar
- Bucco-lingual fracture of a mandibular molar

Contraindications: Following are the indications for performing hemisection[2]-

- Insufficientbone support for the remaining root(s)
- Root fusion or proximity so that root separation is not possible
- Strong abutment teeth available (the involved tooth should be extracted and a prosthesis fabricated)
- Inability to complete root canal treatment on the remaining root(s)

Case Selection Criteria: It can only be carried out in teeth where periodontal destruction has only affected one root and the treatment modality is beneficial to an overall treatment plan. Roots should be divergent and not fused and the furcation should be high.[2,5]

Technique: Hemi-section is carried out by making a vertical cut through the crown into the furcation, which results in complete separation of the hemisected section (crown and root) from the tooth segment that is retained. These techniques may or may not require a flap. Often, if the root is periodontally involved, it is removed without a flap. If bone recontouring is indicated, a flap is necessary before root resection is carried out. A sulcularflap design is often adequate without a vertical releasing incision. However, when in doubt, a flap should be raised.[2]

Prognosis: Each case has a different prognosis according to its situation. Success is indicated by tooth retention with the absence of pathosis. Factors determining the success of treatment are Case selection, cutting and preparing the tooth without creating additional damage, good restoration, good oral hygiene, development of caries (the most frequent cause of failure), root fractures, excessive occlusal forces, untreatable endodontic problems& periodontal disease. One of the major factors affecting the prognosis of the tooth is the patient's oral hygiene.Failure to do so will result in periodontal disease and untreatable caries.[2]

CASE REPORT

A 26-year-old male patient reported to the Department Of Conservative Dentistry And Endodontics At Santosh Dental College Ghaziabad, with the chief complaint of pain in the right lower back region since 2 weeks. The pain was dull aching and intermittent in nature, which aggravated in mastication. History revealed patient had gotten the treatmentdone on the same tooth 1 month ago and had been

complaining of pain since then. His medical history was normal. On radiographic examination, themesial root was found containing a broken instrument beyond the apex in the mesiolingualcanal (Fig. 1). A retrieval of the instrument was attempted by creating a staging platform and using ultrasonic(Fig. 2)[6] but was unsuccessful. As the distal canal was patent and periodontally normal, it was decided to partially preserve the tooth by carrying out hemisection by removing the mesial root. The distal canal was obturated (Fig. 3) and sectioning of the root was carried out (Fig. 4,5). One week later post space was prepared in the distal canal and fiber post(Angelus 1.1mm) was cemented (Fig. 6,7) usingparacore (Coletne Whaledent).Tooth preparation was carried out and porcelain fused to metal crown was fabricated and cemented on the distal root. After a 6-month routine follow up the periodontal apparatus and periapical tissues seemed to be normal with periapical healing i.r.t 47.

DISCUSSION

Hemisection is a useful procedure to preserve multi-rooted teeth indicated for extraction.[7]Before sectioning the root, the anatomy must be taken into care.The mesial root is slightly wider buccolingually, it curves mesially near the gingival third but then slopes distally to its apex. A depression on the distal portion is present and a smaller one on the mesial aspect. This gives the root a figure-eight appearance in cross-section. The distal root is less curved than the mesial root but it has a distal apical inclination. Because of these depressions and a greater curvature of the mesial root, this root probably has more resistance to stress than does the distal root and thus may be a better choice for retention.[8] However, due to the nature of its configuration, it is more prone to iatrogenic error. The mesial canals are more difficult to prepare compared to their distal counterparts.

In the present case, the chief complaint of the patient was pain caused due to persistant periapical irritation bya seperated instrument left in the canal by the previous clinician. Any instrument may break-steel, nickel-titanium, hand, or rotary. Overuse or excessive use results in instrument separation. Limited flexibility and strength of intracanal instruments combined with improper use may result in an intracanal instrument separation.[2]Force applied to files during endodontic instrumentation is the main cause of separation.In case instrument separation occurs, the patient should be notified of the same and possible outcomes should be explained.[9]

Several studies reported the success rate of hemisection ranging from 62 to 100% with a follow- up periods of 1 to 23 years. The combined data from these studies indicates an overall success rate of approximately 88% can be expected when these procedures are performed.[8,10]

CONCLUSION

Treatment planning for root resection is the joint responsibility of the endodontist, prosthodontist& the periodontist. The technique of hemisection is one way to facilitate the treatment planning of teeth conserving the remaining tooth structure. Proper case selection improves prognosis and thereby treatment outcome.

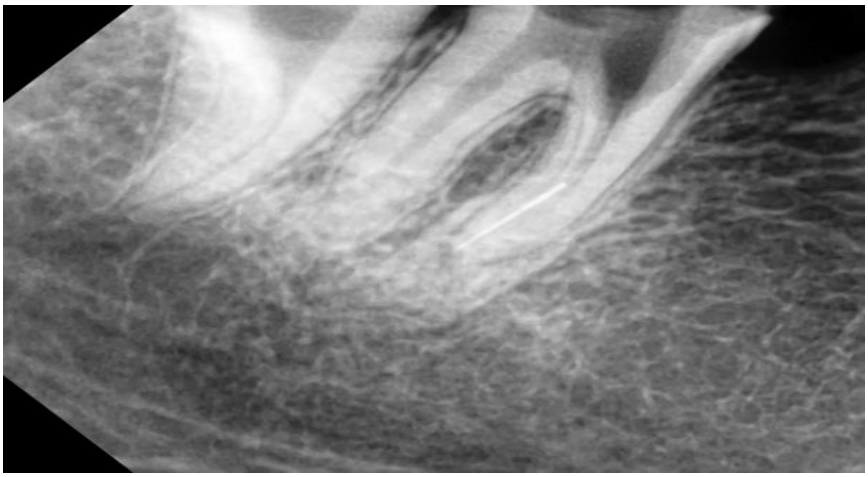

Fig. 1: Instrument separation in mesio-lingual canal

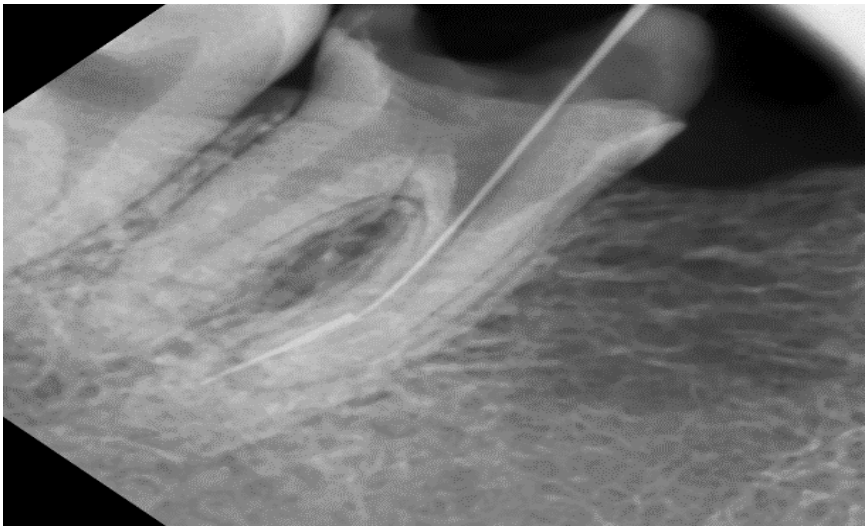

Fig. 2: Retrieval attempt

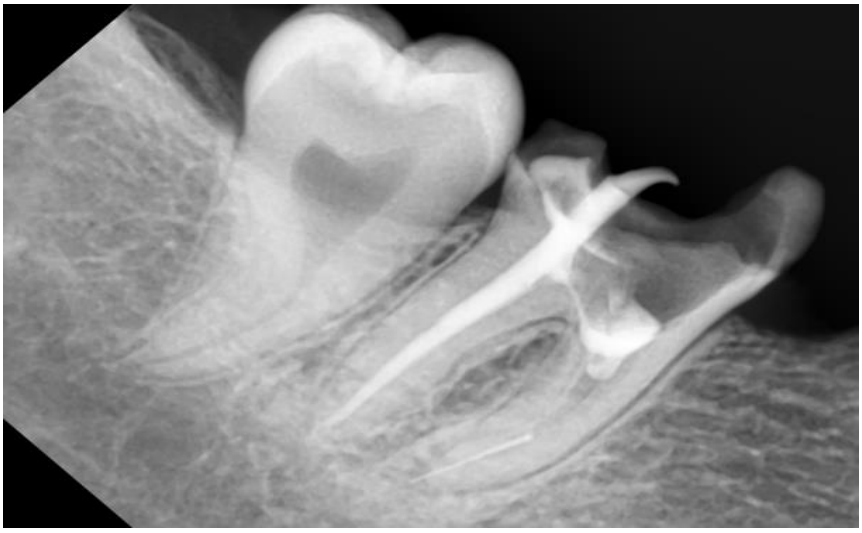

Fig. 3: Obturation of Distal canal

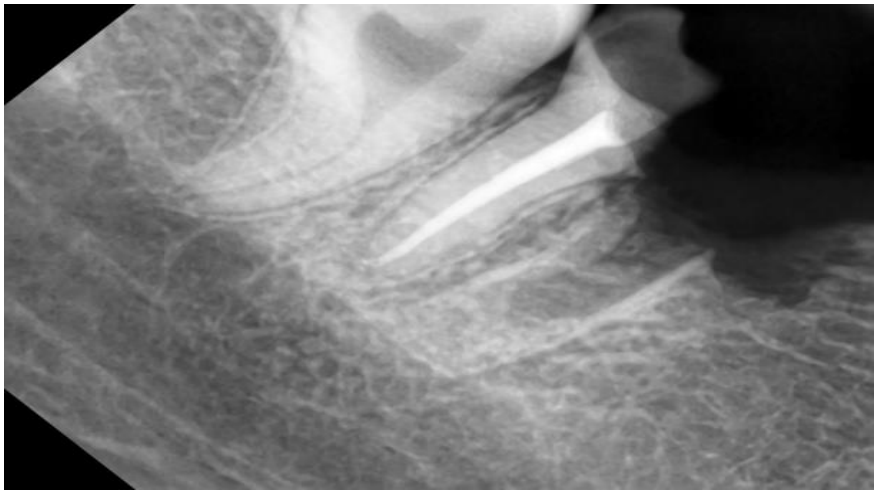

Fig. 4: Mesial root hemisection done

Fig. 5: Distal root after hemisection

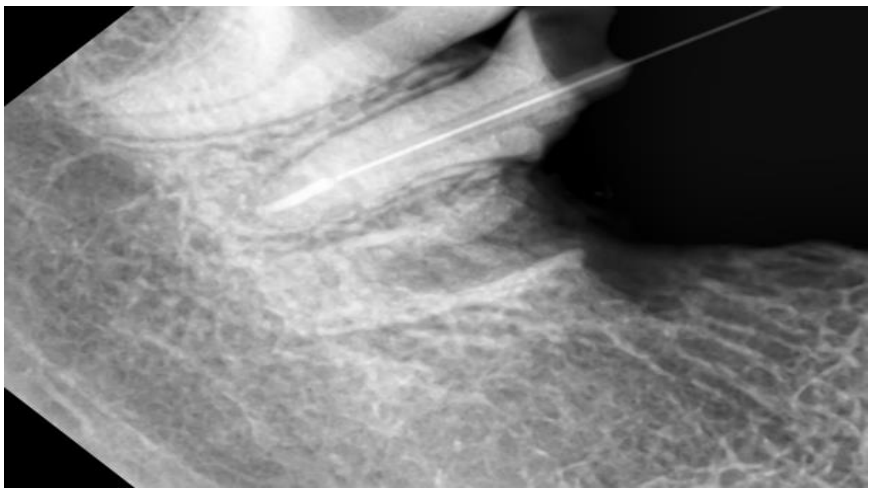

Fig. 6: Fibre post cemented

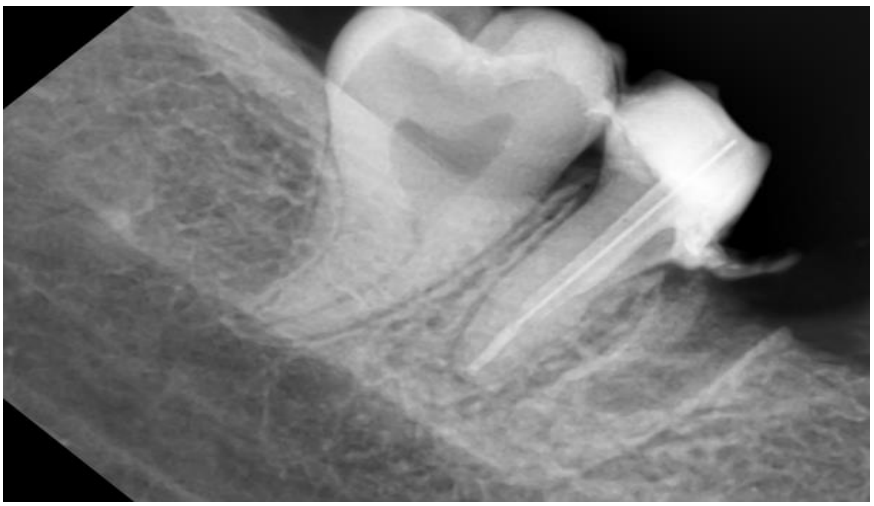

Fig. 7: Core Buildup

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