

Hemisection With Fibre Post Rehabilitation In A Young Permanent Molar: A Conservative Clinical Approach

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Abstract

Hemisection is a conservative treatment modality aimed at preserving a compromised multirrooted tooth by removing the diseased root while maintaining the healthy portion of the tooth. This case report describes the successful management of a grossly decayed mandibular first permanent molar in a 13-year-old patient using hemisection combined with fibre post rehabilitation and prosthetic restoration. A 13-year-old patient reported to the Department of Preventive and Pediatric Dentistry, Jaipur Dental College with a chief complaint of decayed teeth in the lower right posterior region since two months. Clinical and radiographic examination revealed severe destruction and periapical radiolucency associated with the mesial root of tooth 46. The treatment procedure included ultrasonic scaling, gingivectomy using electrocautery, post and core rehabilitation with fibre post in the distal root, hemisection of the mesial root, curettage, and final restoration with a porcelain fused to metal (PFM) crown. Follow-up evaluation demonstrated satisfactory healing, preservation of function, and improved oral health. This case highlights the importance of conservative interdisciplinary treatment approaches in maintaining natural dentition in pediatric patients.

Keywords: *Hemisection, Fibre post, Electrocautery, Pediatric dentistry, Mandibular molar, PFM crown*

Date of Submission: 21-06-2026

Date of Acceptance: 01-07-2026

I. Introduction

Preservation of natural dentition remains one of the primary objectives in modern dentistry. Multirrooted teeth with localized periodontal or endodontic involvement can often be managed conservatively rather than extracted.[1] Hemisection refers to the surgical separation and removal of one root and its associated coronal portion while retaining the unaffected root and crown structure.[2] This procedure is particularly indicated when only one root of a multirrooted tooth is severely compromised while the remaining root possesses adequate periodontal support and restorative potential.[3]

Mandibular first permanent molars are among the earliest erupting permanent teeth and are highly susceptible to caries in children and adolescents.[4] Extensive carious involvement, pulpal infection, and periodontal destruction may jeopardize their long-term prognosis. However, extraction of these teeth at an early age can lead to occlusal disturbances, loss of arch integrity, drifting of adjacent teeth, and compromised mastication.[5]

Advances in adhesive dentistry, fibre-reinforced post systems, electrosurgical techniques, and prosthetic rehabilitation have improved the prognosis of hemisection procedures.[6] Fibre posts offer favorable stress distribution, superior esthetics, and elasticity similar to dentin, thereby reducing the risk of root

fracture.[7] Electrocautery-assisted gingivectomy allows precise soft tissue contouring with minimal bleeding and enhanced visibility during restorative procedures.[8]

The present case report describes the multidisciplinary management of a compromised mandibular first permanent molar in a 13-year-old patient through hemisection and fibre post-supported rehabilitation.

Patient Details

A 13-year-old male patient, Ronak, reported to the Department of Preventive and Pediatric Dentistry, Jaipur Dental College with the chief complaint of decayed teeth in the lower right back tooth region since two months. The patient complained of occasional pain during mastication and food lodgment in the affected region.

Clinical Examination

Intraoral examination revealed grossly decayed tooth structure with respect to tooth 46. Gingival inflammation and plaque accumulation were evident in the involved region. The tooth exhibited deep carious destruction involving the crown with compromised coronal tooth structure.

Radiographic Examination

Intraoral periapical radiograph (IOPA) revealed radiolucency associated with the mesial root of tooth 46 suggestive of periapical pathology. The distal root showed adequate bone support and favorable root morphology for retention and rehabilitation.

Based on clinical and radiographic findings, a treatment plan involving hemisection of the mesial root and rehabilitation of the distal root was formulated.

II. Procedure

Phase I Therapy

Initial periodontal therapy was carried out using ultrasonic scaling to eliminate plaque and calculus deposits and improve gingival health.

Gingivectomy with Electrocautery

Gingivectomy was performed with electrocautery in relation to tooth 46 to achieve proper gingival contour and adequate exposure of the remaining tooth structure. Electrocautery provided excellent hemostasis and improved operative visibility.

Post and Core Procedure

Following endodontic management and preparation of the distal canal, a fibre post was placed in the distal root of tooth 46. The post space was prepared carefully while preserving apical seal. A fibre-reinforced post was cemented using resin cement, followed by core build-up to restore the lost coronal tooth structure and provide support for definitive prosthetic restoration.

Hemisection Procedure

Under local anesthesia, a vertical cut was made through the bifurcation area using a long shank tapered fissure bur. The mesial root along with the associated compromised coronal portion was sectioned and atraumatically removed. Curettage of the extraction socket was performed thoroughly to remove granulation tissue and infected debris.

The retained distal root was evaluated for stability, periodontal support, and occlusal harmony. The surgical site was irrigated with sterile saline and hemostasis was achieved.

Prosthetic Rehabilitation

After adequate healing, tooth preparation was carried out and a porcelain fused to metal (PFM) crown was fabricated and cemented over the retained distal segment to restore function, occlusion, and esthetics.



FIG : ARMAMENTARIUM



FIG: PRE – OP IOPA

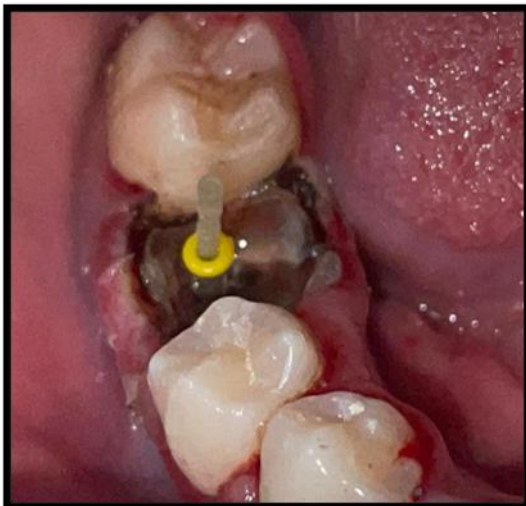


FIG: FIBRE POST PLACED i.r.t. DISTAL ROOT



FIG: MESIAL ROOT SECTIONED



FIG: MESIAL ROOT REMOVED



FIG: PFM PLACED i.r.t. MESIAL ROOT OF 46

III. Discussion

Hemisection serves as a valuable treatment alternative for preserving strategically important multirooted teeth that would otherwise require extraction. The success of hemisection depends on careful case selection, periodontal status, endodontic adequacy, restorative feasibility, and patient compliance.[2,3]

In the present case, the mesial root of tooth 46 demonstrated periapical pathology and poor prognosis, whereas the distal root exhibited adequate bone support and favorable morphology. Therefore, retaining the distal root through hemisection represented a conservative and biologically sound treatment option.

Electrocautery-assisted gingivectomy offered several advantages including reduced intraoperative bleeding, better visibility, shortened operative time, and enhanced soft tissue management.[8] Adequate exposure of tooth structure is essential for successful post placement and prosthetic rehabilitation.

Fibre posts have gained popularity due to their modulus of elasticity being similar to dentin, thereby distributing functional stresses evenly along the root and minimizing catastrophic fractures.[7,9] Their adhesive bonding to root dentin also improves retention and fracture resistance in structurally compromised teeth.

The use of a PFM crown following hemisection provided reinforcement and protection to the remaining tooth structure while restoring occlusal function. Proper occlusal adjustment is critical in hemisection cases to prevent excessive forces on the retained root.

Long-term prognosis of hemisected teeth depends on meticulous oral hygiene maintenance, periodontal health, and regular follow-up.[10] In young patients, preservation of natural dentition is particularly important for maintaining alveolar bone integrity and normal occlusal development.

This case demonstrates that interdisciplinary management involving periodontal surgery, restorative dentistry, endodontics, and prosthodontics can successfully preserve compromised permanent molars in pediatric patients.

IV. Conclusion

Hemisection is a conservative and cost-effective treatment modality for retaining compromised multirooted teeth with localized pathology. In the present case, successful rehabilitation of mandibular first permanent molar was achieved through electrocautery-assisted gingivectomy, fibre post-supported core build-up, hemisection, and prosthetic rehabilitation with PFM crown. Careful diagnosis, appropriate treatment planning, and interdisciplinary collaboration contributed to favorable clinical outcomes. This approach can serve as a viable alternative to extraction in selected pediatric patients.

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