SP-5

Management of Vertical Loss by Hemisection - A Report of Two Cases.

Devakar Rajendran, M.D.S, Private Practitioner,[1*] Deepti JV. ,M.D.S., Senior Lecturer,[2] Loganathan Saatwika., B.D.S., Third Year Pg Student,[3] Arunajetasan Subbiya ,M.D.S., Professor And Head[4]

[1.2.3.4] Department of Conservative Dentistry and Endodontics,Sree Balaji Dental College and Hospital, Bharath Institute of Higher Education and Research,Narayanapuram, Pallikaranai,Chennai -600100.Tamil nadu, India.

Abstract: Hemisection is the sectioning of a multirooted tooth's crown portion with the loss of periodontal connection in order to preserve the natural tooth structure and get a fixed prosthodontic prosthesis. This is a good therapeutic choice, when caries, resorption, perforation, or periodontal disease is limited to one root and the other root is generally healthy.The present case series discusses the management of periodontally diseased teeth with severe bone loss in which the distal roots were retained to support as an abutment.

Keywords: Root amputation, hemisection, root resection, furcation defect

INTRODUCTION

When one root of a multirooted tooth cannot be preserved, hemisection is suggested so that the other roots have enough periodontal support and the remaining crown structure can be restored[1]. Root amputation, according to Grossman, is a dental example of the proverb "half a loaf is better than none"[2]. Thus tooth resection is a procedure to preserve the remaining tooth structure rather than sacrificing the full tooth[3]. The term tooth resection is the excision and removal of any segment of the tooth or a root. Resection procedures are root amputation, hemisection, Radisection and bisection. Root amputation is the removal of one or more roots while other roots are retained. Hemisection is theremoval of root with its associated crown portion of mandibular molars. Radisection is the removal of roots of maxillary molars. Bisection or bicuspidization is termed as mesial and distal root separation in mandibular molar and those segments are retained individually [3,4].As always, case selection is a crucial thing about success. Proper diagnosis, treatment planning, case presentation, and good restorative procedures are all equally important to the procedure itself [5]. Prognosis is determined by the bone support, occlusal relations, crown–root ratio and restoration [6]. Here, we present two case reports in which periodontally compromised mandibular first and second molars are retained by hemisection.

***Case* I:**

A 45 years old male patient reported to the department of Conservative Dentistry and Endodontics, Sree Balaji Dental College and Hospital, Chennai, with the chief complaint of pain and mobility in his lower left back tooth region. Clinical examination revealed grade I mobility and was sensitive to percussion. On probing, deep periodontal pocket around the mesial root of the tooth was evident. On radiographic examination, it was noted that mesial root had severe vertical bone loss involving the furcation area. The bone support of the distal root was completely intact (Fig 1A). Hence, the treatment plan was to resect the mesial root after the completion of endodontic treatment. The working length was determined (Fig 1B) and the canals were biomechanically prepared using the step-down technique. Root canal treatment was done with obturation of gutta-percha points with lateral condensation method in the distal root and the chamber was filled with composite to maintain a good seal (Fig 1C). Amputation of mesial half (crown and root) was done with the vertical cut method (Fig 1D). Using long shank tapered fissure carbide bur, the crown was cut at the bifurcation area. To confirm separation, a tiny probe was put through the incision. The mesial root was extracted and the socket was irrigated adequately with sterile saline to remove bony chips and composite debris (Fig 1E). The extraction site was irrigated, debrided and sutured with 3/0 black silk sutures. Retained distal root was confirmed by the post operative radiograph (Figure 1F). A fixed bridge with retained distal half and mandibular second premolar with sanitary pontic was designed once the tissues healed.

Case II:

A 38 years old female patient reported to the department of Conservative Dentistry and Endodontics, Sree Balaji Dental College and Hospital, Chennai with the chief complaint of food lodgement in her lower left back tooth region since six months. Clinical examination revealed deep carious lesion upto the furcation associated with 37 and had grade I mobility. On probing 9 mm deep periodontal pocket was seen all around the mesial root of the tooth (Fig 2 A). On radiographic examination, radiolucency was seen till the furcation area. There was vertical bone loss surrounding the mesial root. The bone support of the distal root was completely intact (Fig 2B). After the completion of endodontic therapy of the tooth mesial root was was resected by the vertical cut method (Fig 2 C,D,E). Post operative radiograph shows retained distal root (Figure 2F).

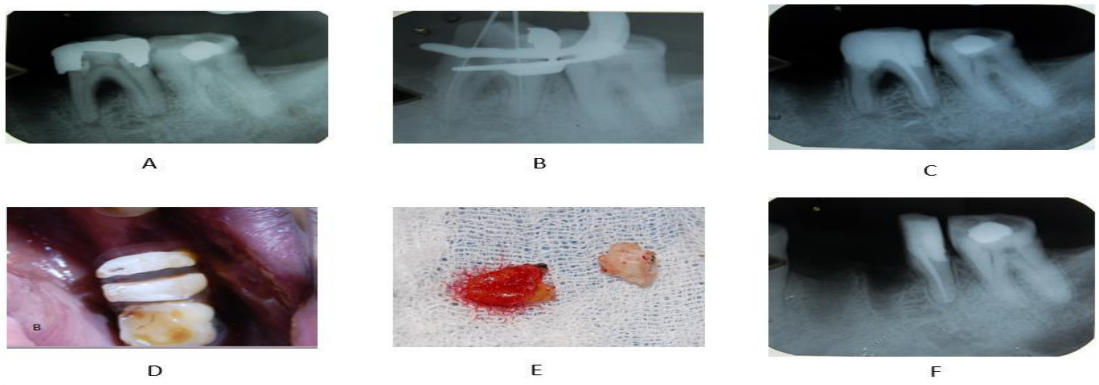

Figure 1- A) Radiograph showing vertical bone loss around mesial B) working length determination C) obturation of only distal root D) Vertical cut towards the bifurcation E) Amputation of mesial half F) Radiograph showing retained distal portion

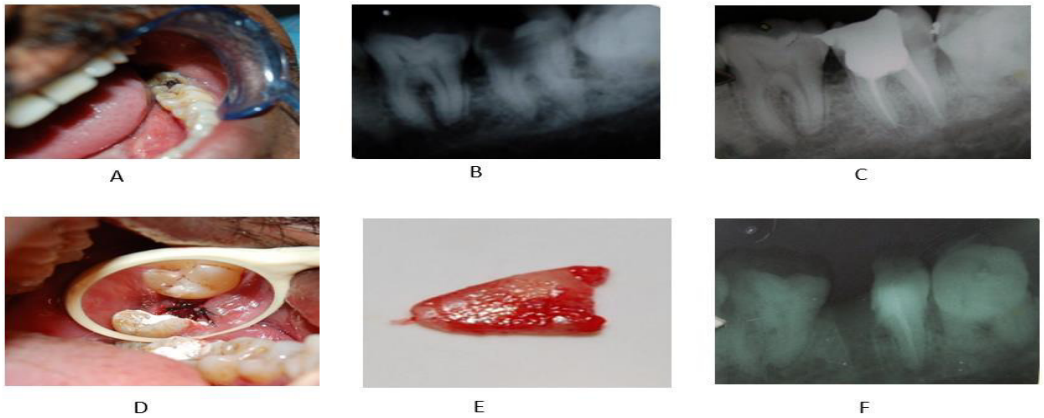

FIGURE 2- A) Pre-operative B) Caries involving furcation vertical & bone loss around mesial root C) obturation of roots D) Vertical cut towards the bifurcation area E) Amputation of mesial half F) Radiograph showing retained distal

DISCUSSION

Root-resection treatment is so technique-dependent and difficult and hence good patient selection is important. For molars with periodontal, endodontic, restorative, or prosthetic issues, root resection is a therapeutic option. The treatment procedures taken to guarantee tooth retention vary in complexity [7]. The predicted treatment of a mandibular molar that has lost all bone support of a root, in other words, that has had a Class II furcation involvement, is frequently a frustrating process for both clinicians and patients. The dentist has traditionally struggled with the treatment, management, and long-term retention of mandibular molar teeth with such invasions. One of the approaches to treat such cases is Hemisection. In the case of problems such as significant vertical bone loss, hemisection is a reasonable alternative to explore before extraction of molars (one root of a multi-rooted tooth), furcation loss, adverse proximity of adjacent tooth roots, preventing adequate hygiene in proximal areas, and severe root exposure due to dehiscence, hemisection is a reasonable alternative before extraction of molars [8]. Endodontic failures, vertical fracture of one root, and non-restorable portion of a multi-rooted tooth are all endodontic/restorative issues that necessitate hemisection [9]. Endodontic treatment is performed on the retained root, and the furcations region is rendered self-cleansable by gently removing the root's lip. Because root fractures cause hemisected teeth to fail, it's critical to repair them properly using an extracoronal restoration [10]. Up to 4 months of follow-up, the patient had an excellent prognosis with correct occlusion, no movement, and a healthy periodontal state. Hemisection is a viable therapeutic option for molar teeth that would otherwise have to be removed owing to severe lesion, according to prior findings [11].

CONCLUSION

Hemisection is an alternative, effective and conservative treatment modality over conventional procedure or extraction of periodontally and endodontic affected teeth. Hemisection should be discussed with patients during consideration of treatment options.

CONFLICT OF INTEREST

Conflict of interest declared none.

REFERENCES

1. Carnevale G, Pontoriero R, Hürzeler MB. Management of furcation involvement. Periodontol 2000. 1995 Oct;9:69-89
2. Guttmann JL. Grossman's Endodntic Practice,13th edition, 2016.
3. Basaraba N. Root amputation and tooth hemisection. Dent Clin North Am. 1969 Jan;13(1):121-32
4. Rajasekar P, Mitthra S, Malarvizhi D, Subbiya A. Hemisection of Mandibular First Molar: Clinical Management—A Case Report. Indian Journal of Public Health Research & Development. 2019 Dec 1;10(12):2126-30.
5. Farley JR. Hemisection and bicuspidization of molars. Tex Dent J. 1974 Jun;92(6):4-5.
6. Langer B, Stein SD, Wagenberg B. An evaluation of root resections. A ten-year study. J Periodontol. 1981 Dec;52(12):719-22.
7. Buhler H. Survival rates of hemisected teeth: an attempt to compare them with survival rates of alloplastic implants. Int J Periodontics Restorative Dent. 1994 Dec;14(6):536-43.
8. Shah S. Hemisection - A conservative approach for a periodontally compromised tooth - A Case Report. J Adv Oral Res 2012; May-Aug 3(2): 31-36.
9. Weine FS. Endodontic Therapy. Mosby, St Louis, Mo, USA, 5th edition, 1996.
10. Rapoport RH, Deep P. Traumatic hemisection and restoration of a maxillary first premolar: a case report. Gen Dent. 2003 Jul-Aug;51(4):340-2
11. Shafiq MK, Javaid A, Asaad S. Hemisection: An option to treat apically fractured and dislodged part of a mesial root of a molar. J Pak Dent Assoc 2011;20:183-6.