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Surgical Management of Root Caries in Maxillary 1st Molar with Root Resection: A Case Report

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Abstract:- The successful management of endodontically involved teeth depends on adequate biomechanical preparation and obturation in adherence to a satisfactory coronal seal. However, challenges such as extensive carious involvement, periodontal attachment loss, and iatrogenic mishaps which include ledges, blocked canals and instrument separation compromise the salvation of teeth. Treatment options such as mishaps in multirooted teeth can range from endodontic treatment along, combined endodontic-periodontal treatment or extraction in cases with poor prognosis. One such treatment in such case could be root resection known as Radisection. This article highlights a case report of root resection in the maxillary molar.

Keywords:- *Radisection, Maxillary Molar.*

I. INTRODUCTION

The main objective of endodontic restoration is to create a dentition that will operate normally and be comfortable for the remainder of one's life. Clinicians are being assisted in achieving this aim by procedural developments like root resection. Root resection, according to the AAP (American Academy of Periodontology), is a treatment where one or more dental roots are removed at the location of the furcation, leaving the crown and other roots intact and still functional.[1]

Root resection, also known as radisection or root amputation, can be distinguished from crown resection (CR) surgery by the fact that the former involves amputation at the cementoenamel junction level while leaving the coronal region intact. On the other hand, "crown resection" refers to the traversal of the furcation by hemisection, trisection, or bicuspidization of the crown in a multirooted tooth so that both the corresponding piece of the crown and the root may be removed or preserved. [2] Radisection is often indicated for teeth with periodontal issues, endodontic issues, root fractures, and prosthetic issues. Endodontic problems such as root fracture, file fracture, root perforation, severe subgingival caries, and radisection may be advantageous if the teeth have high strategic significance or when all other efforts to salvage the tooth have been unsuccessful.[3]A decision between preservation and extraction, followed by the restoration of missing tooth structure, must be taken in the event of such problems. A study done by Fugazzotto over a cumulative period of 15 years, revealed a success rate of 97.0% for molar implants and 96.8% for root-resected molars.[4] A review by Setzer et al.[2] reported five studies of root resection performed on the maxillary arch, in which data extraction regarding specific procedures showed an overall success rate of 97.8% in cases with a follow-up of more than 12 months.

While radisection is a viable alternative for saving the tooth, the literature contains relatively few long-term follow-ups of instances where it has been done. As a result, this report focuses on a case with a follow-up where the maxillary molar's mesial root was removed because of the cause.

II. CASE REPORT

A 40-year-old male reported to the conservative and endodontics department with the main complaint of discomfort that had been present for a month in the upper right posterior tooth area. Intermittent in nature, the discomfort was made worse by chewing and food impaction. The patient's medical history was non-contributory.On clinical examination, there was deep proximal caries in the mesial root with respect to the maxillary right upper first molar (16). Radiographically, there was evidence of root caries associated with the mesial root of 16. Based on the examination, a final diagnosis of symptomatic chronic irreversible pulpitis was made. The treatment plan was formulated, and the postoperative restorative plan was discussed with the patient, a final treatment plan of completion of root canal treatment with distal and palatal roots, followed by root resection of the mesial root of 16 was finalized, and the same was done as follows. The patient was thoroughly explained about the procedure and its complications, and the consent of the patient was taken.

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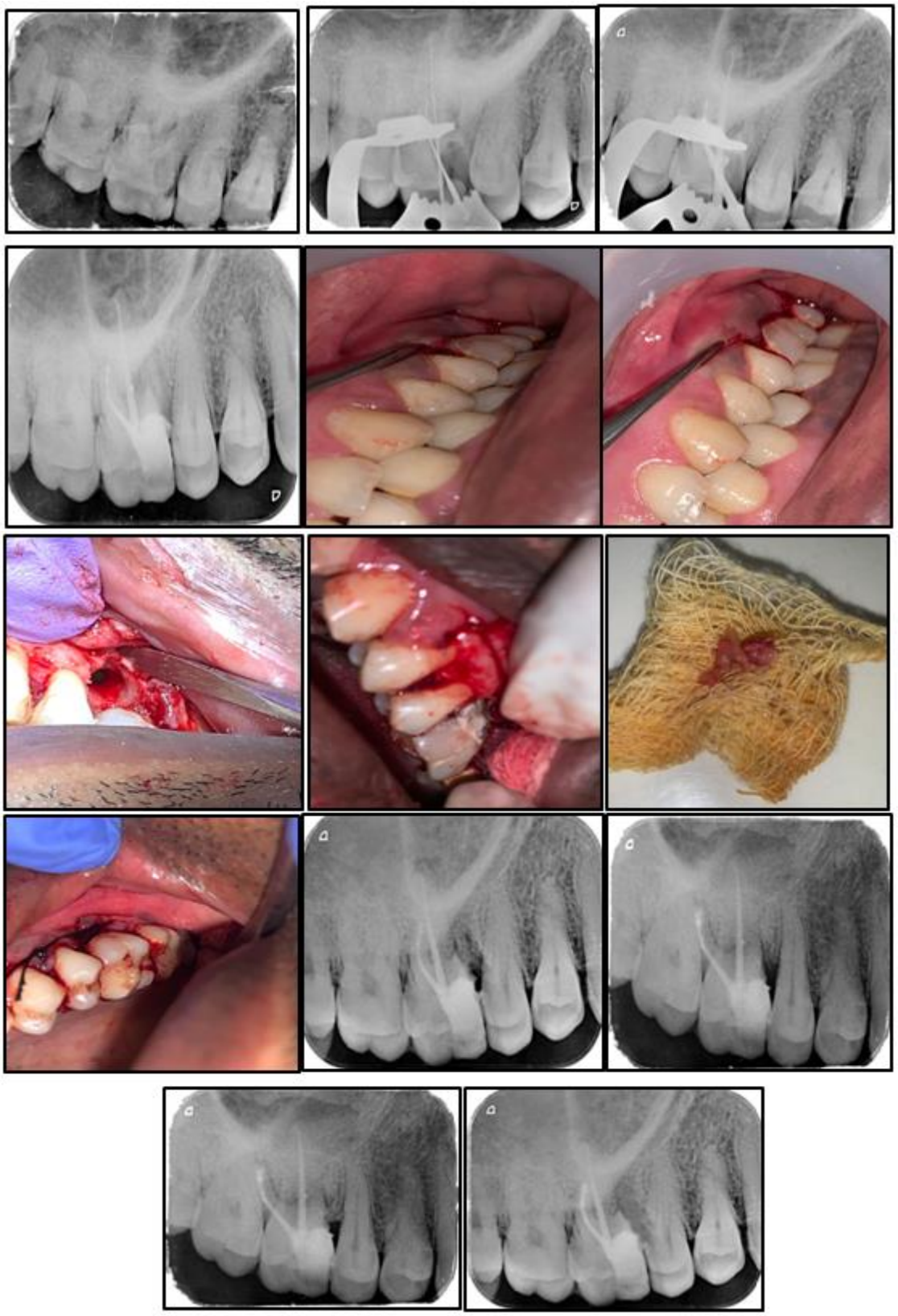

Fig 1:- A: Pre-operative radiograph, B: Working length, C: Master cone, D:Obturation with Post endo restoration, E & F: Flap was raised, G:Root removed from socket, H:GIC was applied to seal it, I:separated root fragment, J:suture of flap, K: Radiograph after root removal, L,M&N: follow up after 1,3 and 6 months

III. DISCUSSION

Root resection was first used as an effective dental treatment option in the late 1800s.[5] Farrar claimed in 1884 that root excision is a suitable surgical procedure for certain furcated molar teeth. In 1894, Dr. W. J. Younger spoke before the American Medical Society and shared his viewpoint on the root amputation operation for molar teeth with irreparably damaged roots that can be made pleasant and useful for years. Prior to starting the root excision, Coolidge in 1930 and Sommer in 2002 both underlined the significance of eliminating germs through thorough root canal preparation and sealing. Contributions by Hiat and Amen focused on root amputation methods and indications in the 1960s[6], which Farshchian and Kaiser put into practice by using the bicuspidization surgery to treat teeth with significant furcation involvement. [7]

Inability to properly treat and fill a canal, root fracture, root perforation, or root caries in the furcation region are all endodontic indications for root excision, according to Dalkz et al.[8] In the current case report, root excision of the mesial root was performed. This case was also chosen based on the criteria for root resection selection, including the presence of an acceptable amount of bone, the angle, and position of the tooth, the length and straightness of the roots, the divergence of the roots, and the potential for endodontic and restorative dentistry. [8,9]

Root resection is a complicated interdisciplinary technique that necessitates case selection expertise and knowledge. Some cases that are not candidates for this operation include those with fused roots, undesirable architecture, retained roots that cannot be treated endodontically, significant root desorption, and poor oral hygiene.[8]

As stated by Newell, root resection" is the retention of the tooth, but there are certain disadvantages associated with this procedure. [10] Due to the fact that it is a surgical procedure, the patient may experience greater levels of anxiety and pain. Additionally, the furcal area is more susceptible to dental caries after resection, and if the area is neglected, there is a high risk that the endodontic treatment on any remaining roots will fail. In addition, restoring the residual tooth structure such that it can operate on its own or as an abutment for a prosthesis might cause periodontal damage due to poor margins or excessive stresses being placed on the wrong occlusal contact region.[11]

Fugazzotto's[4] 15-year follow-up research revealed a success rate of 97.6% for maxillary first molars that had their roots removed, in contrast to Langer et al.[12], who reported an 84% failure rate in molars after a 5-year period. This disagreement was caused by the later study's random selection of patients without adequate follow-up, which prevented it from evaluating the efficacy of periodontal and endodontic therapy following root excision and neglected the issue of functional loading and unloading in such circumstances.[4] As a result, radisection is a technique-sensitive treatment that should only be done after carefully considering the prognosis of the tooth to be operated on.

IV. CONCLUSION

According to the present case study, radisection can be considered a viable therapeutic option to get rid of the diseased root and save the tooth that is still healthy. The effectiveness of root excision treatments depends heavily on the case selection and multidisciplinary approach, which includes endodontic, periodontic, and prosthodontic care. In order to prove that radisection is a successful therapeutic choice, long-term follow-up is also required.

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