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Clinical Evaluation of two Different Filling Materials In Case Of Endodontic Surgery (Mineral Trioxide Aggregate and Biodentin - Case Reports

Anil K Tomer[1], Anjali Miglani[2], Sandeep Rana[3], Priyali Chauhan[4], P. Nagarjuna[5]

[1]*Professor And Head In The Department Of Conservative Dentistry And Endodontics, DJ College Of Dental Sciences And Research, Ghaziabad, India*
[2]*Reader In The Department Of Conservative Dentistry And Endodontics, DJ College Of Dental Sciences And Research, Ghaziabad, India*
[3]*MDS 3rd Year Post Graduate Student In The Department Of Conservative Dentistry And Endodontics, DJ College Of Dental Sciences And Research, Ghaziabad, India*
[4]*MDS 3rd Year Post Graduate Student In The Department Of Conservative Dentistry And Endodontics, DJ College Of Dental Sciences And Research, Ghaziabad, India*
[5]*MDS 3rd Year Post Graduate Student In The Department Of Conservative Dentistry And Endodontics, DJ College Of Dental Sciences And Research, Ghaziabad, India*

Abstract: *A good apical seal is very crucial for achieving success following surgical endodontics. In this case reports a standardized surgical technique was employed: the root end was resected perpendicularly and a root-end cavity was prepared and filled. A follow up cone beam computed tomography was taken with follow up at 6 and 9 months.*

I. Introduction

A good apical seal is very crucial for achieving success following surgical endodontics. Endodontic surgery often includes the various steps like debridement and curettage of periradicular lesion from the pathologic tissues, exposure of root apex, root end resection, root end preparation and insertion of root end filling material.(1) Surgical endodontics is often indicated when nonsurgical endodontic treatment is unsuccessful or not predictable.(2)

The field of Endodontic has seen vast improvements in technology and techniques over the past several years. Perhaps the one area of Endodontic that has improved the most is the way in which surgery is performed.(3)

II. Aim

Aim is to evaluate outcome of two different retrograde filling material (Mineral Trioxide Aggregate and Biodentine) in cases of endodontic surgery

Surgical procedure:

` After patient was anesthetized with 2% Lignocaine with1:80,000 adrenaline,a sulcular and mucogingival incision is made with B.P.Blade Flap elevation will be done using Elevator Osteotomy will be performed byusing no-4 and 6 round carbide bur with Impact Micro-motor handpiece andcurette (DISK SHAPED CURETTE-1.5mm) were be used for periradicular curettage.At first a 3mm root tip with 0-to10-degree bevel will be sectioned by Taper fissure170L under copious water spray.Root-end preparation will be done extending 3mm into canal space using round andcarbide bur. Resected root surface will be stained with methylene blue and inspectedWith microscope under high magnification X14X26to examine the cleanness of root–end preparation and other anatomic structures. Prepared root end cavity will be dried. With irrigator/drierand filled with material such asMTA and Biodentine.

Adaptation of filling material will be confirmed by using x-ray.The wound site will be closed & sutured and post-operativeradiographs were taken.The patients were instructed regarding the postoperative care, thesutures were removed after 4-7 days postoperatively, and healing progress will be checked and recorded properly. After whole procedure patients were recalled in every 3 months6 month and for 9 months to assess the clinical and radiographicsigns of healing by the use Cone Beam Computed Tomography.

III. Case Report One

A 16 year old patient come to the department of conservative dentistryand endodontics with the complain of pain maxillary left lateral incisorand accidient occurred when the patient was 14 year old.Radiographic examination, that Periapical lesion are present in relationof left upper lateral incisor and treatment plane is periapical surgerydone with MTA retrograede filling material.

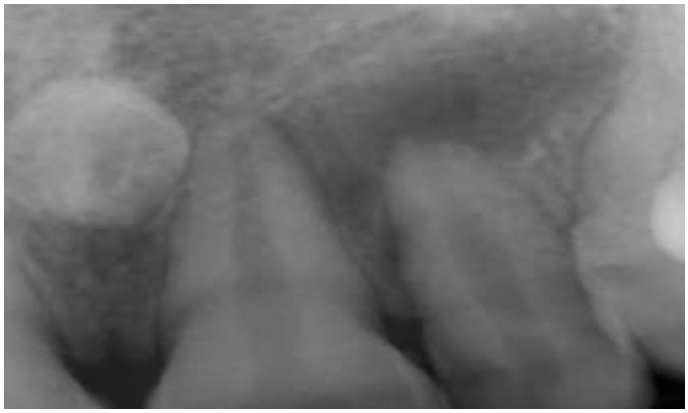

Figure 1- Preoperative radiograph

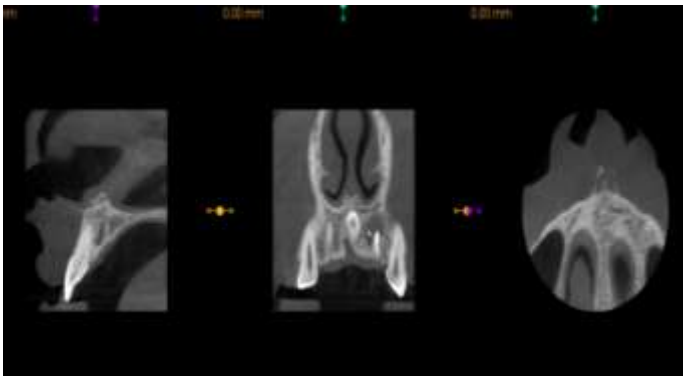

Figure 2- Preoperative CBCT

Figure 3- Preoperative image

Figure 4- Flap reflected

Figure 5- Window prepration and biodentin placement

Figure 6- Bonegraft placement

Figure 7- Suturing

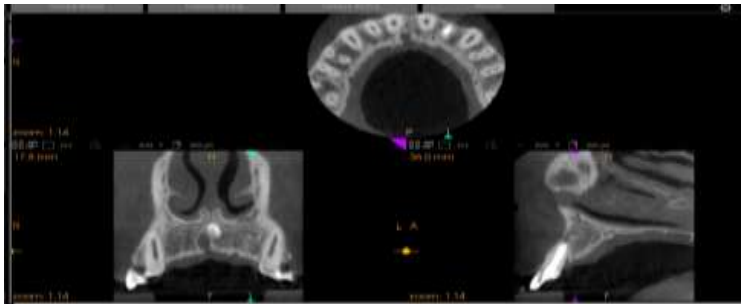

Figure 8- CBCT after 6 months

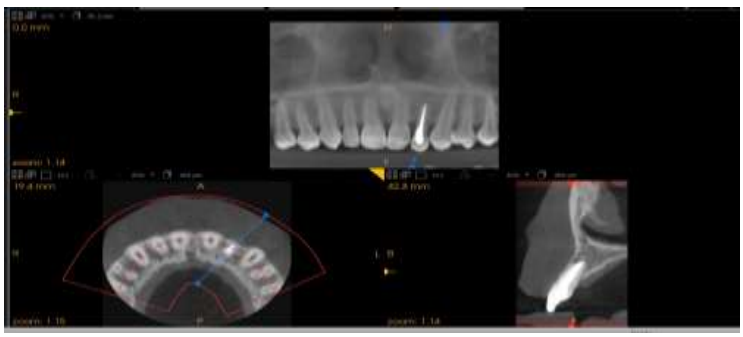

Figure 9- CBCT after 9 months

Case Report Two

A 37 year old patient come to the department of conservative dentistryand endodontics with the complain of pain in mandibular both central and lateral incisor.Radiographic examination, that Periapical lesion are present in relationof mandibular anterior tooth resion both central and lateral incisor andtreatment plane is periapical surgery done with Biodentinretrogradefilling material.

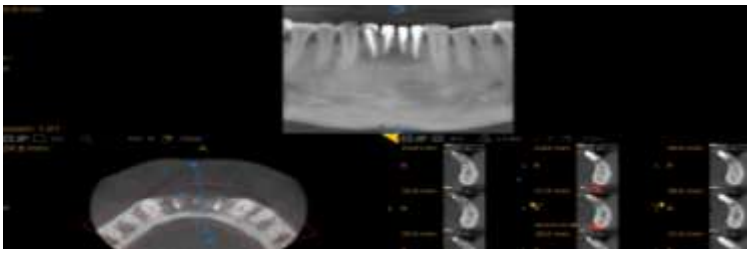

Figure 10- Preoperative CBCT

Figure 11- Preoperative image

Figure 12- Flap raised

Figure 13- MTA placement

Figure 14- Bone graft placement

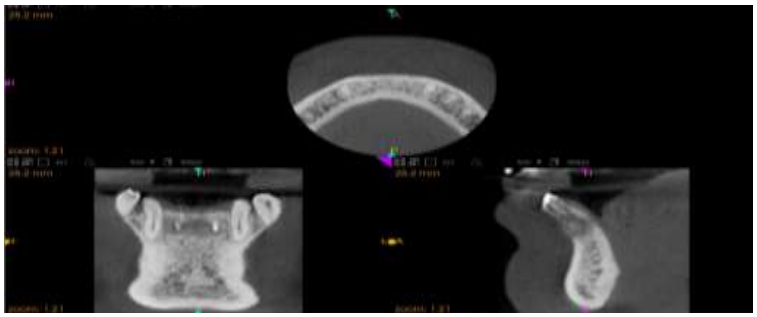

Figure 15- CBCT after 6 months

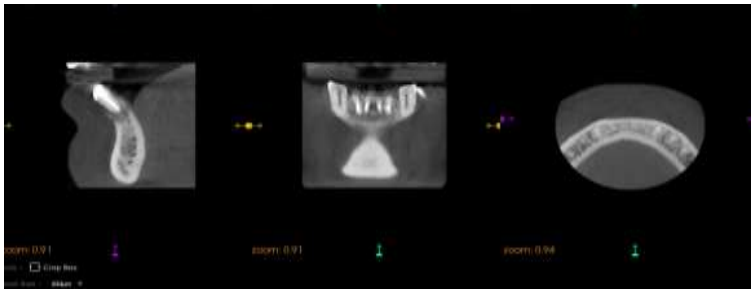

Figure 16- CBCT after 9 months

IV. Discussion

Endodontic surgery is a safe and adequate alternative when teeth are not responding to conventional treatment and endodontic re-treatment. It must only be applied in specific situations.(4) Endodontic surgery is a surgical procedure which consists in the excision of pathological. periapical tissue from root surface (including apical accessory canals), and, lastly, canal or canals sealing against pathologic agents, thus reaching the goal of creating the best conditions to the tissue health, regeneration and creation of new tooth structural support.[(5)]

The **goal of periradicular surgery** is to remove all necrotic tissues from the surgical site, to completely seal the entire root canal system, and to facilitate the regeneration of hard and soft tissues including the formation of a new attachment apparatus [(6)] The purpose of this case report, placing retrograde filling materials(Mineral Trioxide Aggregate, Biodentin) to seal after apicoectomy is to establish an effective barrier between the root canal and the periapical tissues when a conventional orthograde seal is not possible. An ideal root end filling material would adhere and adapt to the walls of root end preparation, prevent leakage of microorganisms and their toxins into the periradicular tissues, be biocompatible, be insoluble in tissue fluids and dimensionally stable and remain unaffected by the presence of moisture.

MTA(Mineral Trioxide Aggregate)-It was developed at Loma Linda University, CA, U.S.A in 1993. This cement contains tricalcium silicate, tricalcium aluminate', tricalcium oxide, silicate oxide and other mineral oxides forming a hydrophilic powder which sets in presence of water. The resultant colloidal gel solidifies to a hard structure within 4 hours. Initially the pH is 10.2 which rises to 12.5 three hours after mixing. It is found to be more opaque. MTA, when used as a root-end filling material, showed evidence of healing of the surrounding tissues. Most characteristic tissue reaction of MTA was the presence of connective tissue after the first postoperative week.[(7)]

Biodentine is a new material based on calcium silicate technology. The powder contains dicalcium silicate, tricalcium silicate, calcium carbonate and iron oxide, and zirconium oxide filler. Liquid consists of calcium chloride which is acting as accelerator and a polymer which is acting as a water reducing agent. Due to its better handling properties with a setting time of around 45 min, this material can be alternatively used as a retrograde filling material. . Biodentine shows apatite formation after immersion in phosphate solution, indicative of its bioactivity.[(8)]

V. Conclusion

In this case report was done to evaluate the effectiveness of two newer diffrent root end filling materials (Biodentin and Mineral Trioxide Aggregate) in relation to their healing rate ability.In this study periapical surgery was done and pre-operative and post-operative cone beam computed tomography of lession was taken (follow-up of 3 Month, 6 Month and 9 Month). and it was concluded that patient was asymptomatic clinically and radiographly after the surgery.

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