Case study

Revascularization Using Lesion Sterilization and Tissue Repair: A Case Report.

Abstract- Clinicians come across a number of cases where a permanent tooth is affected by trauma followed by periradicular change and that are beyond conservation by traditional endodontic procedures. Permanent tooth with open apex is difficult to preserve due to short root length. In the era of modern dentistry, a new treatment option which is less invasive and less time-consuming procedure could be beneficial for the patient as well as the clinician. This case report presents such treatment option of using lesion sterilization and tissue repair for pulp revascularization.

Keywords- dental pulp, antibiotics, revascularization, sterilization

INTRODUCTION: -Revascularization may be a treatment option for cases of immature teeth with pulp necrosis, the techniques of artificial apical barrier allows the continuation of root development and recovery of pulp vitality. Root canal preparation for revascularization consists of passive chemomechanical preparation performed with manual instruments and auxiliary chemical substances with antimicrobial property and low toxicity, antimicrobial medication placement and subsequent bleeding induction. Revascularization was introduced as an alternate to apexification from 2001 onwards. Increased thickness of the dentinal wall, closing of the apical foramen were observed over a period of 5 months follow up.[1]

Conventional treatment of immature teeth is accomplished by inserting long-term calcium hydroxide paste with the aim of inducing the formation of a calcified barrier which will further allow for the subsequent filling of the root canal.[2] an alternative technique to the use of calcium hydroxide is to produce an apical MTA barrier, avoiding the periodical exchange of intracanal medication[4]. However, both techniques have the same disadvantage of not allowing the continuity of root development, causing the main to stay weakened and thus increasing the danger of fracture[3]

In the cutting-edge generation, a new perspective that is less invasive and much less time-eating system will be a ray of desire for the affected person as well as the clinician. The LSTR claims its significance in such clinical instances. The cariology research unit of niigata college faculty of dentistry has evolved the concept of LSTR remedy via hoshino in 1990 and popularized by takushige. The LSTR is an endodontic remedy system that includes non-instrumentation or minimal instrumentation accompanied by placement of antibiotic combination in a propylene glycol car to disinfect root canal systems, and peri-apical lesions. It medicates and treats caries,

pulpitis and root canal infection. The mechanism of LSTR is repair by way of natural defense mechanisms of host. Sterilizing the canals and pulp chamber through medicaments can lower the bacterial load. Sterilization with medicaments will lead to 20 to 40% cleaning action and debridement. Most typically an aggregate of 3 antibiotics together with solvent macrogol and propylene glycol are used, so it is also called three mix mp pastes[5].

PREPARATION OF TRIPLE ANTIBIOTIC PASTE

The maximum critical step in LSTR is the preparation of Triple antibiotic paste. (Fig1) The most not unusual combination is the one proposed through takushige et al. This includes Metronidazole, ciprofloxacin, and minocycline. The Commercially available antibiotics are taken in separate dappen dishes. The enteric coating of the tablet is eliminated via scraping the coating with a blade, and for the capsule the outer capsular material is removed. Then every of the additives are powdered one at a time in clean Mortar and pestle. Care must be taken to avoid wetting of powder. At this degree, if the powder has to be stored, it can be stored separately in tightly capped porcelain containers and stored in dark place or in the refrigerator to prevent exposure to light and moisture. After right Pulverization, each of the components is taken in a clean Glass slab/blending pad. Then a part of the solvent is allotted. The triple antibiotic mixture has most impact whilst seven parts of powder are mixed with one a part of Solvent. So after allotting, the powder is divided into seven components and every element blended separately with the Solvent to ensure uniform consistency of the combination. The final coaching can be a gentle ball-like shape of 1 mm Diameter. If the mixture is gentle add greater 3 blend powder to this. If the training turns into flaky, dry and too tough, then add extra solvent. Resultant opaque paste has to be saved in hermetic boxes. If the mix turns translucent on storage, it has to be discarded.[6-8]

Case report

This is a case of 14-year-old patient came to the department of conservative and endodontics with fractured tooth. On clinical examination it was found to be Ellis class III fracture with 11. Clinical examination revealed lack of response to pulp sensibility tests, percussion, and palpation.

Radiographic Examination Revealed That Tooth #11 Had Incomplete Root Formation, And Periapical Lesion.(Fig 2)

The Diagnosis of Pulp Necrosis with Chronic Periapical infection was confirmed. After Evaluating the Choices,the Treatment Choice Was Pulp Revascularization

After preparation of triple antibiotic paste, access cavity was prepared. Local anesthesia was given, and rubber dam isolation was done. The access cavity is prepared using round bur, and the necrotic tissue is removed followed by irrigation with saline and sodium hypochlorite. The ethylenediaminetetraacetic acid (EDTA) was used to allow deeper penetration of antibiotics into the dentinal tubules. Cavity was prepared to place

medicament using a round bur at the canal orifice which is 2 mm deep, and 1 mm wide, and is meant for retaining the triple antibiotic paste at the canal orifice. After proper drying, the paste is placed in the cavity, and followed by MTA was placed. (Fig 3)

The radiographic control after one year and six month of treatment revealed that the lesion had disappeared, and there was thickening of the dentin walls. (Fig 4, 5, 6)

Bacteria which are present mainly in the root canal system and superficial layer of contaminated root canal wall may additionally be effortlessly eliminated by way of traditional endodontic treatment. But the bacteria, which continue to be in the deep layers of root canal dentin, may additionally leak out to periapical space and cause complications. Application of antibacterial medicinal drug to endodontic lesions is one of the medical approaches that can be used to sterilize such lesions.[9] In this fact, a single antibacterial medicine can also no longer be effective, even if it is a broad spectrum antibiotic, due to the fact bacterial composition of the contaminated root canals is complicated in natural. In addition, micro organism may additionally invade root canals from different oral sites, like dental biofilm, saliva and from carious dentin which may also additionally smear the root canal at some stage in endodontic treatment. All such micro organism has to be centered by way of precise antibacterial medication. Since the majority of micro organism in the deep layers of contaminated dentine of the root canal wall consists of obligate anaerobes, metronidazole was once chosen as first preference amongst the antibacterial drugs. Metronidazole even at excessive concentrations can't eradicate all microorganisms indicating the necessity of different pills.[11, 12] Thus, ciprofloxacin and minocycline, in addition to metronidazole had been added to sterilize contaminated root dentin.This combination antibiotics paste has to penetrate root canal dentin. The penetration capacity of these pills was once elevated through mixing these tablets with propylene glycol and macrogol. The penetration ability of propylene glycol was clearly demonstrated by Cruz et al.[13] In patients displaying internal/external root resorption, physiologic root resorption exceeding 2/3root size requiring brief time period house management, Lesion Sterilization and Tissue Repair might also be regarded as an choice technique.[14,15]This approach might also additionally locate utility in uncooperative children and with special health care needs in whom traditional endodontic cure can't be carried out due to related conditions. The technique has additionally been used in controlling recurrent/persistent

CONCLUSION

In this case report endodontic treatment using antibacterial mix (a combination of ciprofloxacin, metronidazole, and minocycline mixed with propylene glycol and macrogol) has shown good clinical and radiographic success. However, we advocate further clinical and histological studies with longer follow-up.

Figure 1

Triple antibiotics mix preparation

Figure 2 Preoperative radiograph

Figure 3

Triple antibiotics followed by MTA placed

Fig 4- 6 month follow up

Fig 5-12 month follow up

Fig 6-18 month follow up

Figure 7

Post op after composite restoration

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