Medico Research Chronicles

ISSN No. 2394-3971

Case Report

MANAGEMENT OF CHRONICALLY INFECTED UPPER CENTRAL INCISOR WITH OPEN APEX- A CASE REPORT

Dr. Tirthankar Bhaumik*, Dr. Utpal Kumar Das

Department of Conservative Dentistry & Endodontics, Guru Nanak Institute of Dental Sciences and Research Panihati, Kolkata

Submitted on: September 2016
Accepted on: November 2016
For Correspondence
Email ID:
drtirthankar.bhaumik@gmail.com

Abstract:
Patients who present with chronically infected tooth with open apex pose a special challenge to dentists and require a special treatment plan to manage the situation. This case report presents the clinical procedure used to produce a hard tissue barrier in the open apex, and onto which cold flow able guttapercha was condensed to create the fluid tight seal both in coronal and apical region.

Key words: Open apex, Treatment, Special, Barrier

Introduction:

The golden rule in the practice of endodontology, is to debride and obturate the canals as efficiently and three – dimensionally as possible in an amount of time and appointments that are reasonable to the patient. Majority of endodontic cases can be managed predictably and comfortably by conventional treatment protocol but there are a group of patients that defy predictable routine treatment. This group is present with large open apex, divergent root walls, thin dentinal walls that are susceptible to fracture and frequent periapical lesions which ultimately compelled dentists to face a special challenge.

The major challenges associated with endodontic treatment of teeth with open apices are achieving complete debridement, canal disinfection and optimal sealing of the root canal system.[1]In the absence of a natural apical constriction, the production of mineralized tissue in the apical region is important to create an apical barrier and allow 3-dimensional adaptation of Obturating material within the root canal system.[2] Calcium hydroxide has been commonly used as an intracanal dressing to induce apexification i.e. hard tissue deposition in necrotic teeth with open apices. The calcium hydroxide is renewed periodically until an apical barrier is formed.[3]The success of calcium hydroxide

in various forms and formulations as an intracanal medicament for apexification has immense literature support. However, time taken for successful apexification varied in those studies.[4]The time needed to form an apical barrier is unpredictable and depends on the size of the apical foramen, the presence of infection and the host.[5, 6]The MTA is a powder composed of thin hydrophilic particles that agglutinates in the presence of humidity, forming a colloidal gel on setting [7]with a pH of 12.5, low compressive strength, low solubility, greater radio opacity than dentine.[8, 9, 10] MTA induces the apical closure without promoting an inflammatory reaction[11, 12] and also fasten the endodontic procedures.[13]

This case report emphasizes management of non-vital tooth with open apex and peri-apical lesion using apexification of MTA apical plug.

Case report:

A 22 years old female patient reported in the Department of conservative Dentistry and Endodontic, Guru Nanak institute of Dental Sciences & Research, Panihati, Kolkata, India with complain of pain for last 7 days in upper anterior region. History revealed that she experienced trauma 10 years back but undergone root canal treatment in some other clinic for the discolored maxillary right central incisor 5 years back only.

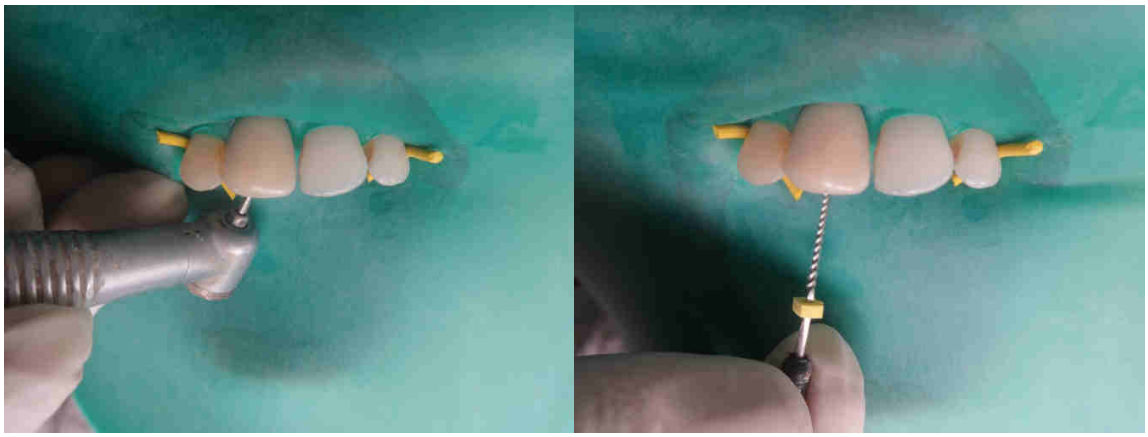
Such treatment could not give complete relief and the patient received some more treatment in different clinics. Unfortunately all these attempts to solve her suffering were not successful and patient reported in our department with anxiety of non-responsiveness of the treatment.

Clinical examination revealed that there was a tender, reddish swelling present on the buccal mucosa region of right upper central incisor. She also had low grade fever but no significant past medical history. Radiographic examination revealed open apex of right maxillary central incisor without any periapical radiolucency.

Re-endodontic treatment of the affected tooth by MTA plug in apical region followed by complete obturation was planned for the management of the case.

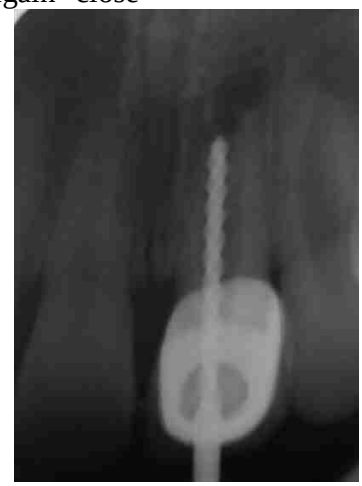
Management:

On the 1st day the affected tooth was isolated, access cavity reopened and all previous dressing in the root canal was removed.



Closed dressing was given after thorough irrigation by normal saline & 2% chlorohexidine solution respectively. Patient was prescribed oral antibiotics along with analgesics.

Patient was recalled after one week, working length was determined (20mm#140 k file), and root canal irrigated and again close dressing with calcium hydroxide was given. This time no medicine was advocated.



After 2 weeks, patient was recalled again, canal was filed, irrigated with chlorhexidine, dried and apical 5mm region was filled with MTA.

Subsequently rest of the canal was given a moist cotton plug and the access was sealed with zinc oxide eugenol cement. The next day remaining part of the root canal was obturated by Guttaflow 2 and access cavity filled by light cure composite resin.

Post procedural check-up was done after 3days,7days, 1 month and 6 month respectively. The patient was all through clinically asymptomatic and radiograph after 6 month showed satisfactory hard tissue healing.

After 1month

After 6 months

Discussion:

Obtaining a good three dimensional fluid tight seal in teeth with wide-open apices always remained a challenge in endodontics. For more than 40 years, such cases are approached clinically with apexification using $Ca(OH)_2$, which acts as an initiator for the formation of osteoid or cementoid barrier over the apical foramen.[14] This takes month to years of follow-ups as an essential part of this type of treatment options.

Revascularization may be considered as a good alternative treatment option for these types of cases but success rate is still questionable and there are no randomized controlled clinical trials available till date. Considering all this, we have decided to perform apexification using MTA plug, which allows apical closure and promotes periapical healing subsequently.

Because of MTA's excellent biological properties and ability to create a good seal, it has been recommended for creating an artificial barrier in the apical area of teeth with open apices, thus reducing treatment time to minimum.

MTA has got a very good sealing ability, as the material immediately bonds with the root wall and creates a mono block. Its high P^H. helps to destroy the surrounding microorganisms and its bio active nature stimulates blastic cells to create favorable environment for healing.[15, 16, 17] It also promotes cementum deposition on it[18] Moreover, due to its fast setting time, fewer

follow-up appointments are required to carry out this treatment.

Not only the selection of material, but also the thickness of apical MTA barrier has played a key role in clinical success. A 5mm thick apical MTA barrier has proven to be significantly stronger with lesser leakage than a 2 mm thick barrier.[19, 20]

In the above case report, cold flow able gutta-percha was used to reduce excessive compaction forces during obturation same as thermoplastisized gutta-percha material.[19]

The choice of treatment regimen for teeth with open apices depends on the individual case and operator's experience and familiarity with handling the materials. Patient's ability for follow-up appointments should be considered before attempting these types of cases.

Conclusion:

The better clinical results in less time can be achieved by MTA than calcium hydroxide in case of treatment of tooth with open apex with chronic periapical inflammation.

Reference

1) Andreasen JO, Flores MT. Injuries to developing teeth. In: Andreasen JO, Andreasen FM, Andersson L, editors. Textbook and color atlas of traumatic injuries to the teeth. 4th ed. Copenhagen: Munksgaard; 2007. p. 542-76
2) Denise Pontes Raldi, DDS, MSc, PhD; Isabel Mello, DDS, MSc, PhD; Sandra MárciaHabitante, DDS, MSc, PhD; Jose LuizLage-Marques, DDS, MSc, PhD; Jeffrey Coil, DMD, MDS, PhD:Treatment Options for Teeth with Open Apices and Apical Periodontitis jcda • October 2009, Vol. 75, No. 8
3) Leonardo MR, Silva LA, Leonardo Rde, Utrilla LS, Assed S. Histological evaluation of therapy using a calcium hydroxide dressing for teeth with incompletely formed apices and periapical lesions. J Endod. 1993; 19(7):348-52.
4) Comparative evaluation of different forms of calcium hydroxide in apexification; Subhankar GhoSh, Dibyen Dumazum Dar, Pradip Kumar ray, Bhaswar bhattacharya: Contemporary Clinical Dentistry | Jan-Mar 2014 | Vol 5 | Issue1
5) Leonardo MR, Silva LA, Leonardo Rde, Utrilla LS, Assed S. Histological evaluation of therapy using a calcium hydroxide dressing for teeth with incompletely formed apices and periapical lesions. J Endod. 1993;19(7):348-52.
6) Felippe MC, Felippe WT, Marques MM, Antoniazzi JH. The effect of renewal of calcium hydroxide paste on the apexification and periapical healing of teeth with incomplete root formation. Int Endod J. 2005;38(7):436-42
7) Gomes-Filho JE, Watanabe S, Bernabé PFE, Costa MTM. A mineral trioxide aggregate A mineral trioxide aggregate sealer stimulated mineralization. J Endod. 2009 Feb;35(2):256-60.
8) De Deus G, Coutinho Filho T. The use of white Portland cement as an apical plug in a tooth with a necrotic pulp and wide-open apex: a case report. IntEndod J. 2007 Aug;40(8):653-60
9) Ribeiro AD, Duarte MAH, Matsumoto MA, uarte MAH, Matsumoto MA, Marques MEA, Salvadori DMF. Biocompatibility in vitro tests of mineral trioxide aggregate and regular and white Portland cements. J Endod. 2005 Aug;31(8):605-7
10) dautilização de MTA como plug apical emdentes com ápiceaberto. Rev Bras Odontol. 2011 Jan/Jun; 68(1): 59-63/ Gome.
11) Mente J, Hage N, Pfefferle T, Koch MJ, Dreyhaupt J, Staehle HJ et al. Mineral trioxide aggregate apical plugs in teeth with open apical foramina: a retrospective analysis of treatment outcome. J Endod. 2009;35(10):1354-8
12) Trope M. Treatment of the immature tooth with a non-vital pulp and apical

periodontitis. Dent Clin N Am. 2010; 54:313-24.
13) Castro A, Oliveira D, Diniz L, Eulália A, Paulillo L, Pereira G. Avaliação s-Filho JE, Watanabe S, Bernabé PFE, Costa MTM. A mineral trioxide aggregate A mineral trioxide aggregate sealer stimulated mineralization. J Endod. 2009 Feb;35(2):256-60
14) Jhon I Ingle, Leif K Bakland, J Craig Baumgartner. Ingle's Endodontics. Sixth edition. India: CBS; 2013
15) Shikhadogra, Mukundaks, Aruna A, Shwetha M Rao. Apexification. Journal of dental sciences and research. 2012; 3(1): 41-44
16) Donald R, James O, Ctnil Yesilsoy. Apexification: review of the literature. Quintsence International 1990;7: 589-98
17) Don Schmitt, Jacob Lee, George Bogen. Multifaceted use of ProRoot MTA root canal repair material. American Academy of Pediatric Dentistry. 23:4, 2001: 326-30
18) Pedro Felicio Estrada et al. Comparative study of MTA and other materials inretrofilling of pulpless dog's teeth. Braz Dent J 2005; 16(2): 149-1
19) Anil Kumar G, Kavitha A. Single Visit Apexification with Mineral Trioxide Aggregate. IJDA 2010; 2(1): 122-24
20) Kahtani A, Shostad S, Schifferle R, Bhambhani S.; In-vitro evaluation of microleakage of an orthograde apical plug of mineral trioxide aggregate in permanent teeth with simulated immature apices. J Endod. 2005 Feb; 31(2):117-9.