

Case study

Non surgical management of immature permanent teeth with open apex and large periapical lesion- 8 months follow up.

Abstract

Aim: The aim of this case report is to present a non surgical management of immature permanent maxillary central incisor with open apex and large periapical lesion within 8 months follow up.

Methods & Materials: The traumatic case was presented where the calcium hydroxide and iodoform paste (Metapex®) was placed in the root canals of immature permanent teeth with open apex and large periapical lesion. The teeth involved were evaluated radiographically at regular intervals for the 8 months after placement of the paste. At the end of 8 month the case showed continued root growth and the apical closure (apexification) with no evidence of periapical radiolucency. Conventional endodontic treatment was then performed.

Conclusion: In this clinical case, the calcium hydroxide and iodoform paste (Metapex®) was found to induce apical closure when assessed radiographically and clinically. After a period of 8 months the case showed continued root growth.

Keywords: Metapex, Calcium hydroxide, Apexification etc.

INTRODUCTION

Trauma to the anterior teeth is a relatively common occurrence during childhood resulting in inflammation or necrosis of pulp and subsequent incomplete development of root apices.^[1] Such teeth present with wide root canals and open apices causes the endodontic treatment technically more difficult and time consuming.^[2] Due to the lack of apical barrier to contain the root filling material, obturation of the root canal with an open apex is difficult. **The treatment of choice in such type of case is apexification, i.e. establishing an apical barrier.**^[3]

Apexification is any method responsible to induce a calcific apical barrier in a root

with an open apex or continued development of apex of an incomplete

root in teeth with non vital pulp". Traditionally, calcium hydroxide $\text{Ca}(\text{OH})_2$ has been widely used for the apexification procedure due to its biological and healing performances. Calcium hydroxide combination with other materials has been proved to be the most commonly used material for apex closure. Apexification with calcium hydroxide involves repeated stimulations, for a period of at least 6- 24 months, until apical closure is achieved.^[4] Metapex, a silicone oil-based calcium hydroxide paste containing 38% iodoform is very popular (28) and has

been used as a root canal filling material in primary teeth. Use of it in apexification has also been reported. Iodoform and to the viscous and oily vehicle, which may prolong the action of the medicament. The present case report describes the successful non surgical management of immature permanent maxillary central incisor with open apex and large periapical lesion with 8 months follow up.

CASE REPORT

A 13 year old female patient, reported to the Department of Pediatric and Preventive dentistry, K.D Dental college, Mathura, U.P, India with a chief complaint of swelling in association with her permanent maxillary right central incisor. On further examination it was found that there was no signs of caries or fracture but was sensitive to percussion and palpation. A radiographic image revealed an open apex and an associated large periapical lesion in relation to the right maxillary central incisor. The dental history disclosed that the patient has suffered dental trauma 2 years back with a recurrent swelling.

After administration of local anesthesia, a rubber dam was placed and the access cavity was prepared. Working length was determined with a no. 15 k file and root canal preparation was done till no. 80 k file (DENSPLY) using circumferential filing motion. The canal was irrigated copiously with 1.25% sodium hypochlorite (Vishal Dentocare Pvt Ltd, Hyderabad) and saline. The canal was dried with paper point, and triple antibiotic paste (metronidazole, minocycline, and ciprofloxacin in the ratio of 1:1:1) mixed with propylene glycol was placed as an intracanal

The superior antimicrobial effects of calcium hydroxide may be due to the combination with medicament and the access cavity was sealed with a temporary restoration.

At 14 days recall appointment, the intracanal medicament was replaced with metapex and patient was recalled at 2, 3, 5, 6 and 8 month intervals. The patient was clinically asymptomatic and radiographic evaluation showed reduction in periapical lesion and disclosed significant apical development of the tooth at 3 months interval. Follow up evaluation at 6 months from the time, revealed similar clinical findings and more healing of periapical lesion but the apex was not closed. After 8 months from the time of the induction apex was found closed radiographically.

DISCUSSION

Apexification is the treatment of choice after confirmation of pulpal necrosis in immature permanent teeth. The procedure involves canal cleaning and shaping or the removal of all necrotic tissue, and hermetic sealing of the tooth by placement of suitable material to the apex to avoid bacterial infiltration. The prime importance of apexification procedure is to attain an apical stop for compaction of obturating material.^[5] Various materials has been used for induction of apical barrier formation in nonvital permanent teeth such as calcium hydroxide paste, lime powder mixed with different vehicles, tricalcium phosphate, collagen phosphate, osteogenic protein-1, bone protein, oxidized cellulose, Mineral trioxide aggregate etc.^[6]

Calcium hydroxide has been the first choice material for apexification because

of its antimicrobial action on bacterial cellular components mainly on lipopolysaccharide (LPS) (Jiang et al., 2003) and its high pH causes induction of hard tissue formation (Javelet et al., 1985). lime in contact with vital tissue in the apical area, seems to cause tissue reactions similar to those in the coronal pulp. Apexification procedure usually takes 6-24 months and refilling of root every 3-6 months is favoured.^[7]

Metapex paste has been found to be an effective material for achieving apexification for younger permanent teeth. Metapex, releases lime slowly and tends to remain in the canal and exert its effects over a considerable period of time. In the present study, glass ionomer cement was used to restore the access cavity after placement of metapex in the root canal. This was done to supply an adequate coronal seal, and prevent any micro leakage.

A study by Ghosh et al., showed a 100% success with metapex as compared with calcium hydroxide mixed with water and non-setting calcium hydroxide with water.^[8]

Similar finding was reported for apexification by Gu et al., where there was complete root **developmet** and apical closure.^[9]

The present case indicate good results with metapex as an apexification agent taking into consideration the cost factors, simple placement and radiographic interpretation. This report shows both clinical and radiographic success in achieving apexification. Unlike with barrier formation, continued root growth was observed for the treated tooth.

CONCLUSION

Metapex shows good clinical and

radiographic success in promoting continued root growth and inducing root end closure and also healing of periapical lesion in immature necrotic young permanent teeth.



Fig1.Pre-operative radiograph



Fig.2 2 months follow



Fig.3 3 months follow

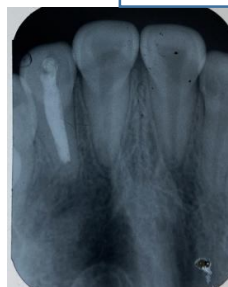


Fig.4 5 months follow

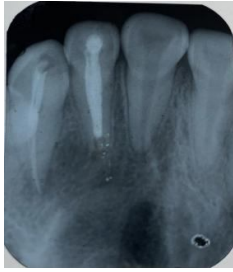


Fig.5 6 month follow up

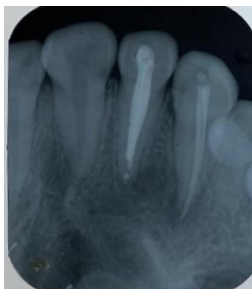


Fig.6 8 month

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Reviewer quires:

1. The treatment of choice in such type of case is apexification, i.e. establishing an apical barrier.^[3] -- it would be better you can write various treatment options available. Including the newer methods in introduction.
2. In methods section, write the manufacture, place and country

- for all the materials and equipment used in the study.
3. 1.25% sodium hypochlorite was used in the study. However the recommended percentage for clinical use 2.5 %. Kindly justify.
 4. In methodology section, it is not clear whether the Metapex was replaced every time when the patient was recalled at 2, 3, 5, 6 and 8 month intervals, or only radiographic evaluation was done.
 5. check for grammatical errors, punctuation marks through out the manuscript.
 6. Write the composition of Metapex in detail either when describing it in introduction or discussion part. Include its disadvantages.
 7. The results of the study at the end are appreciable, however the follow up period is less. It is recommended to do follow up up to 4 years.
 8. In discussion, write some comparative studies and elaborate the discussion. Also include grey studies of metapex if any.
 9. It will be better if you add limitations of your study at the end of discussion.
 10. Kindly find yellow high lighted words/phrases in the manuscript and check for spelling or write complete manufacture details including manufactures, place, country