

Management of Internal Resorption With Immature Open Apex Using Mineral trioxide aggregate and Bioceramic based root canal sealer - A Case Report

Prof. H C Baranwal¹, Dr. Amrita Kumari²

¹(conservative dentistry and endodontics, FDS, BHU, India)

²(conservative dentistry and endodontics, FDS, BHU, India)

Corresponding Author: Dr. Amrita Kumari

Abstract: Internal resorption is a chronic inflammatory process results in the loss of dentin. It begins centrally within the pulp space and results from clastic cells which trigger a progressive resorption phenomenon. An early diagnosis of internal resorption is required to institute the endodontic treatment as soon as possible, before the process compromises mineralized structures of the tooth. Apexification is the treatment of choice for necrotic teeth with immature apex. Mineral trioxide aggregate (MTA) was introduced as an alternative material, for the apexification of immature permanent teeth, to traditional materials which account certain difficulties like very long treatment time, possibility of tooth fracture and incomplete calcification of the bridge. This case report presents successful management of a case with an internal resorption, at the cervical third of the root in the right permanent central incisor which is associated with immature apex using MTA followed by obturation with birootrcs sealer.

Keyword: Internal resorption, Apexification, MTA, Birootrcs sealer

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I. Introduction

The internal resorption, also known as intracanal resorption, is considered as a rare case of resorption which appears as a typical dystrophy of the pulp which jeopardizes the hard tissue of the teeth, thus changing its normal morphology(1). Most cases follow injury to pulp tissue, such as physical trauma or caries-related pulpitis(2). Internal resorption occurs very rarely, but however the prevalence has been estimated to be between 0.01% and 1%(3). Thoma K concluded internal root resorption in 1 out of 1,000 teeth examined. It is more often observed in males than in females and most commonly affected teeth are maxillary incisors(4). The defect in internal resorption is usually circumscribed and oval shaped. Clinically the affected tooth is usually asymptomatic and discovered by chance on routine radiographic examinations or by looking at the clinical sign of a “pink spot” on the crown(5). When internal resorption is detected, root canal therapy is the only effective treatment and should begin as soon as possible to limit progression(6).

II. Case Report

A 22 year old Patient reported to department of conservative dentistry and endodontics with chief complain of recurrent pain since last 15 day with respect to upper front tooth. Patient also gave history of trauma to anterior teeth during childhood while riding a bicycle. Clinical examination revealed discoloration with maxillary right central incisor. IOPA radiograph of 11 showed well defined ballooned out radiolucency in the root canal at cervical third region. Radiographic examination also revealed wide open apex which may pose problem during root canal treatment. Thus apexification and thermoplasticized obturation of the root canal was planned as a suitable treatment modality for this case.

Local anesthesia was administered and tooth was isolated using rubber dam. Access cavity preparation was done with tooth 11. Canal was wide open and even 80 no k file had no binding at the apex. Hence WL was determined using 20 no k file and cotton wrapped around it for apical binding (WL was 19mm). Lateral filling with 80 no k file was done. Due to the wide nature of the apex and presence of internal resorption, more attention was given on chemical debridement than mechanical. Canal was irrigated regularly during filing using 2% chlorhexidine solution activated with endoactivator (dentsply). Sodium hypochlorite was avoided due to presence of open apex. Final irrigation using 17% EDTA was done. After thorough cleaning and shaping, calcium hydroxide was placed as intra canal medicament and patient was recalled after one week. On next appointment apexification of tooth with MTA was planned. Calcium hydroxide was properly irrigated from the canal and was dried using paper points. Apical 4 mm was sealed using MTA (MTA angelus) using messung gun

and hand pluggers. Apical plug was confirmed using IOPA radiograph. As setting time of MTA is around 240 mins, patient was recalled next day for obturation of root canal. Canal was re-entered, apical seal was checked and then obturated bioceramic based sealer (birootrcs) using downpack technique (beefill). IOPA radiograph was done to confirm the sealing of internal resorption defect. Cavity was then sealed with GIC and composite restoration. Patient was kept for follow up at 6 and 12 month. Patient was symptom free for the follow up visit.

III. Discussion

It is difficult to clean and fill accurately in an irregular canal of internal root resorption cases. An open apex also creates difficulty in carrying out a satisfactory RCT due to absence of an apical stop. As this was an internal resorption case with open apex, excessive shaping would have weakened the remaining dental structure so we relied more on chemical disinfection with saline, chlorhexidine and EDTA than mechanical debridement. Calcium hydroxide dressing was provided for one week because MTA has a lower antimicrobial activity compared with that of calcium hydroxide, due to reduced ion diffusion of hydrated products over time(7).

Mineral trioxide aggregate was used for apexification procedure in this case due to MTA apexification being a single step procedure while a calcium hydroxide apexification requires multiple appointments and a long duration. An MTA apexification also allows the obturation to be carried out in the next step, while the use of calcium hydroxide imposes an inordinate delay. BioRoot RCS is a bioceramic based sealer showed higher calcium ion release than other sealers over a prolonged duration. The prolonged mineralizing ion release triggers the nucleation of calcium phosphate, which may improve the sealing ability of obturation materials(8). Here we have used thermoplasticized gutta-percha obturation using beefill device, as only thermoplasticized gutta-percha in such cases is able to flow into and fill the irregular resorption defects and provide a satisfactory seal.

IV. Conclusion

At the completion of treatment, we were able to fulfill all the goals we set out with, namely to maintain the tooth in an esthetically and functionally satisfactory condition while utilizing a nonsurgical conservative approach. By negating the need for extraction and expensive rehabilitation, the application of modern endodontic technologies allowed us to fulfill this aim.

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IMAGES:



Figure 1: pre operative IOPA

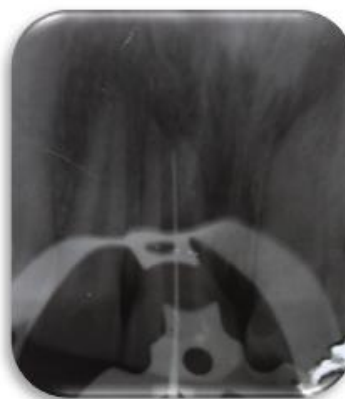


Figure 2: WL IOPA



Figure 3: Master cone**Figure 4: apexification with MTA**

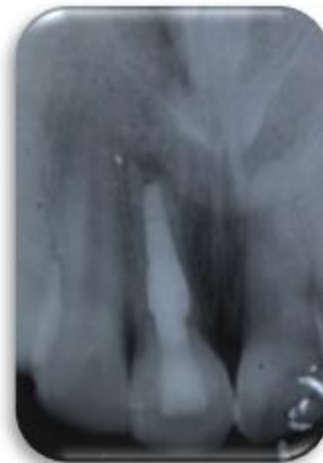


Figure 5: OBTURATION**Figure 6: FOLLOW UP**

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