

Case Report

Internal Root Resorption – A Case Report for Hopeless Tooth

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Abstract: Internal root resorption has been reported as early as in the early of the 18th century. It presented with the classic oval-shaped enlargement of the root canal area. It can be classified as either inflammatory or replacement. Non-surgical root canal treatment for this diagnosis may present with an inimitable operative encounter. Clinical considerations: A non-surgical root canal retreatment had been attempted and discussed in this paper. The attempt has proved to give more time for the tooth to be functional in the patient mouth. Conclusions: The reduction from 8-mm to 4-mm in pocketing depth, resolving of periapical lesion and no signs and symptoms at the 6-months review provided a favorable outcome to once a hopeless tooth.

Keywords: Endodontic, Root Canal Treatment, Internal Root Resorption

1. Introduction

Dated in the 1830, root resorptions have been declared as an insurmountable endodontic dilemma [1]. Internal resorption is once considered rare in permanent teeth. It is usually characterized by oval-shaped enlargement of the root canal space [2]. Many authors have simply explain the aetiology [3, 4], in addition to clinical manifestations [3, 5] and the histologic and radiographic findings [3, 6, 7] together with the management of the pathological resorptive process [4, 5] of internal root resorptions.

Internal resorption is a subtle process when the badly affected pulp is completely free of symptoms. On the other side, this condition has been identified to imitate moderate acute pulpalgia. Clinically, the pain intensity may vary from none, mild to moderate at bearable stage. When confined to the crown, sufficient tooth structure may be degenerated to be implicated through enamel in time. The vascularised granulation tissue of the resorption lacuna may be visible [2]. 'Pink tooth' appearance may be clinically examined [3]. Even though, internal resorption may occur in chronic pulpal inflammation, it as well able to occurs as an idiopathic

dystrophic changes. The progression of root resorption consists of multifaceted collaboration of inflammatory and resorbing cells, leading to multi-nucleated giant cells and resorption of hard tissues [8]. Accidental trauma or infection has regularly been accused as a triggering means for internal resorption [6]. The typical diagnosis of internal root resorption is predominantly founded during routine radiographic findings and complementary evidence established from the patient's history and clinical findings [11].

2. Clinical Case Report

A 55-year old Chinese male was referred for management of 16. The referring dentist suspected an internal resorption had perforated the mesio-buccal (MB) root of 16. The endodontist suggested internal or surgical repair as patient is really keen to preserve the MB root without resection.

He complained of dull pain especially when eating hard food. He was an insurance agent. His past medical history was non-contributory. He had no history of traumatic injury or orthodontic treatment. The patient was a regular dental attendee and keen to keep his dentition intact as long as possible.



Figure 1. Clinical frontal view.

The patient's oral hygiene was considered fair with generalized mild deposit of plaque. All permanent teeth were present. Upper right central incisor was chipped off at the incisal third. Ceramo-metal crown (CMC) was placed on 16. Abrasion cavities were noted on 14, 15, 24 and 25. Metal ceramic bridge was present from 26 to 28. Except 16, periodontal probing in all teeth was 3mm or less and normal mobility was detected in all teeth.

Upon clinical examination, tooth 16 presented with a metal-ceramic crown. There was a sinus tract present at the disto-buccal mucosa of this tooth. This 16 was not tender to palpation or percussion. A 8-mm pocket was detected at its mid-buccal aspect.



Figure 2. Pre-operative radiograph of 16.

Based on pre-operative radiograph (Figure 2), the sinus tract was traced with a gutta-percha point size 30, with the periapical radiograph revealing that it led to the distal region of 16. The tooth had been root treated before. Widening of periodontal space was noted with this 16 and a large radiolucent area within the mesio-buccal root. There appeared to be an asymmetrical 'ballooning' out of the middle part to the apical part of the mesial root. The radiopacity on the coronal represent the ceramo-metal crown.

A diagnosis of chronic apical suppurative periodontitis associated with failed root canal treatment complicated with internal resorption and 8 mm deep pocketing at midbuccal was made for the tooth 16. The prognosis of 16 was considered poor during consultation.

3. Case Management

3.1. Treatment Planning

The patient was informed about the poor prognosis of the

tooth due to extensive internal root resorption extending to mid root. The patient was advised on the clinical findings and various treatment options were discussed including non-surgical root canal retreatment, no treatment at all, resection or tooth extraction. All the technical challenges and potential risks of the procedure had been explained to the patient. He had given consent for the best potential method to preserve the tooth via non-surgical root canal retreatment despite extraction. Patient has expressed the desire to maintain a functional tooth as long as possible without any resection.

3.2. Treatment Details

Non-surgical root canal retreatment of tooth 16 was performed under local anaesthesia (Xylocaine® with 1:80,000 adrenalin), rubber dam isolation and magnification from a dental operating microscope. Access cavity was prepared after dismantle the metal ceramic crown of 16 and old coronal restoration were removed and restored with GIC, stabilized with an orthodontic band. The periphery of the access cavity was redefined to facilitate straight line access.

Three obturated canal orifices could be distinguished. The old root fillings were removed with H-files and solvent. The MB2 was located and negotiated. The MB1 and MB2 canals were joined at the apex. Granulomatous tissue was seen during the removal of gutta-percha from MB1 canal. For both mesio-buccal canals, both were irrigated by chlorhexidine and physiological saline to avoid any mishap. The internal resorption was at the palatal extending to the furcal region. The working length for all canals were measured with an electronic apex locator (Root ZX Apex Locator, J Morita Corporation, Kyoto, Japan) and confirmed with a periapical radiograph (Figure 3). Patency was established with a size 10 K-file and the canals were prepared by the step down technique [15].

The master apical file size of the mesiobuccal canal was 35, distobuccal canal was 40, and the palatal canal was prepared to a master apical size of 50. Sodium hypochlorite (3%), chlorhexidine (2%), EDTA (17%) and physiological saline (9%) were used to irrigating the canals. The root canals were dried using calibrated absorbent paper points.

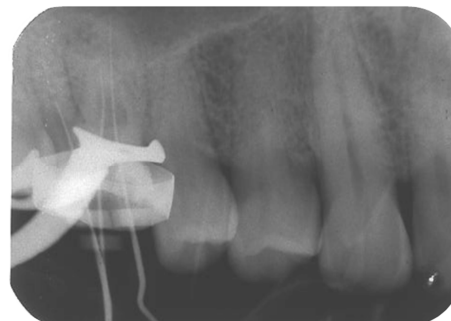


Figure 3. Working lengths radiograph.

Non-setting calcium hydroxide (Calasapt®) was used as intra-canal medicaments. All inter-appointment temporization was carried out with a cotton-pellet, Cavit®, and IRM®.

Except MB1 and MB2, all canals were obturated with gutta-percha and AH Plus sealer using warm vertical compaction technique. The canals were backfilled with Obtura II gutta percha system. MTA was used for the obturation of the MB canal.

Approximately 1 to 2 mm of IRM® was placed over the root filling of all canals leaving about 1 to 2 mm space coronally for the radicular-bonded amalgam. The 16 was restored with a bonded corono-radicular amalgam and a post-operative was taken (Figure 4). Patient was advised to return back to the referring dentist for further management of 16.



Figure 4. Post-operative radiograph.

The patient was reviewed 6 months after the completion of root canal retreatment. The patient had received a ceramic crown for 16 (Figure 5). Patient had no complaint and the tooth was not tender to palpation or percussion. There was no sinus tract noted. Periodontal probing depths were 3mm or less and no mobility associated with the tooth. The condition of the tooth was considered favorable despite a poor prognosis given at the early of treatment.



Figure 5. Clinical appearance at 6-months review.

4. Discussion

Fuss (2003) has attempted to classify root resorption based on stimulation factor in order to render a proper treatment by eradicating the triggering mechanisms [4]. For this patient, the metaplastic area of the pulp might develop from a previous localized haemorrhage subsequent by dentinal destruction. Following triggering mechanism, internal resorption may be detected and diagnosed by routine radiographic examination and complemented by clinical findings from history and

examination [5]. To date, CBCT give a three dimensional image of the afflicted teeth [1, 11]. Differentiation between the external and internal resorption may be made radiographically [9]. Usually, on periapical radiograph, the lesion of internal resorption were sharp well defined smooth margin needless asymmetrical.

One more signal is the manner in which the pulp 'disappears' into the lesion, not extending through the lesion in its shape. Another sign was the walls of lesion may appear balloon out [9]. Every now and then, an area of resorption may be misled to be caries on radiographic appearances. Nevertheless, dental caries appearance is less sharply defined than is internal resorption. Both should not be uncared for. Internal root resorption may be able to advance up to the extensive tooth destruction and finally lead to perforation [7].

In an earlier study, Wedenberg and Lindkog experimentally inducing internal resorption in monkey incisors. They concluded that there were two types of internal resorption: transient which able to repair itself and progressive which are from persistent stimulation by infection. Although, different theories has been proposed on origin of pulpal granulation tissue involving in internal resorption. His explanation was the most logical. Inflamed pulp tissues are due from infected coronal pulp space [6].

Masterton (1965) have studied the incidence of internal resorption subsequently pulpotomies in human and monkey teeth. He found that in a presence of comprehensive dentinal barrier and uninflamed pulp, internal resorption was not seen. On the other hand, when the pulpal was chronically inflamed and no barrier was formed, there are chances of internal resorption to occur [3].



Figure 6. Radiograph at 6-months review.

In this present case, patient was diagnosed as having chronic apical suppurative periodontitis associated with failed root canal treatment complicated with internal resorption and 8 mm deep pocketing at midbuccal for the tooth of 16. The treatment plan of 16 was non-surgical root canal retreatment. Preparations were made to ensure a thorough elimination of granulation tissue [14].

Chemo-mechanical debridement and obturation have proven to be a challenge in this case with limited access to the resorptive region. Consequently, endosonic device was used on tooth 16 to improve the efficacy of removing biofilms and necrotic tissues from the inaccessible regions [10]. A

conservative endodontic management had been the patient's option including a thorough chemo-mechanical debridement with various irrigants and placement of calcium hydroxide as intracanal medication [14].

MTA was used for the obturation of the MB canal. Various studies have shown that MTA displays good biocompatibility [12], provides good apical seal [13] and capable to stimulates bone reposition thus healing [12]. Freshly mixed MTA has a soft consistency and may be applied without pressure; ultrasonic was used as an aid to express the material into position. Direct observation under dental operating microscope was possible for the wide apex, which allowed monitoring of the procedure in action. Dental operating microscope and the usage cone-beam computerized tomographic (CBCT) significantly improve the diagnosis, clinical procedures and post-operative review [8]. MTA application in internal root resorption also has proven to give an optimal result in a long follow up [16].

Aggressive internal root resorption may complicate the prognosis of the root canal treatment due to weakening of remaining tooth structure and possible periodontal involvement [16]. Despite a poor prognosis, the radiographic evaluation at the six-month review showed no signs of progression of the internal resorption associated with periodontal and periapical health tissues. Patient was happy to retain his tooth at the six months review session.

It is best if a longer review session may be obtained to monitor the survival of the tooth. A follow up with a CBCT would be beneficial for a better definition and visualization of the lesion area over a conventional radiographic image [14]. Although the limitation of a conventional periapical radiograph in diagnosing periapical lesion does not justify the routine use of CBCT in endodontic treatment, yet the method may be applied if further information is required for the management of bone formation [17].

5. Conclusion

It is puzzling in diagnosing and treating a root resorption case, therefore a suitable management is perilous. Thorough investigations and discussion are required for the management especially when the prognosis of the tooth is poor upon consultation. The reduction from 8-mm to 4-mm in pocketing depth, resolving of periapical lesion and no signs and symptoms at the 6-months review provided a favorable outcome to once a hopeless tooth.

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