

Endodontics

Management of an Expansile Periapical Lesion – A Case Report



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Abstract

Periapical lesions are termed endodontic lesions when pulpal necrosis is the prequel leading to periapical inflammation or destruction. However non-odontogenic periapical lesions mimicking endodontic lesions have also been extensively documented in the literature. Hence establishing a proper diagnosis and choosing an appropriate treatment modality is critical. The management of a 24 year old male patient with an asymptomatic swelling in the right mandibular region is presented. The lesion was excised surgically and the involved teeth were treated endodontically.

|| Key Words

Cone Beam Computed Tomography, Excisional Biopsy, Periapical granuloma, Platelet Rich Plasma.

|| Introduction

Periapical lesions can be a result of inflammatory reaction that may or may not be associated with infections. It can be a simple result of aseptic trauma. The lesions rarely are developmental or fissural cysts that can arise from different cell rests or trapped cell remnants in a fissure. Periapical lesions can thus be classified as odontogenic or non-odontogenic based on their origin. Although rarely occurring, non-odontogenic periapical lesions can mimic odontogenic lesions radiographically. Therefore, establishing an appropriate diagnosis is imperative. Periapical lesions of endodontic origin are most commonly encountered in clinical practice.¹ Periapical lesions are termed endodontic lesions when pulpal necrosis is the prequel leading to periapical inflammation or destruction.² Once the pulpal necrosis is established, its spread is unidirectional through the root canals ultimately reaching the periapical region where the host response can vary based on the circumstances.³

Periapical lesions of endodontic origin may have the ability to expand asymptotically and cause considerable bone destruction. Non-surgical endodontic management of periapical lesions is often preferred; however, a protracting debate exists when it comes to management of periapical cysts. However, management of pocket cysts by conventional endodontic therapy has higher success rates compared to true periapical cysts. From a pathological perspective about 10% of the cases require surgical intervention.⁴ When the lesion is of larger size, retrograde endodontic approach could be advocated. To improve the postoperative healing, novel approaches like Platelet Rich Plasma (PRP) can be employed. PRP are rich concentrates of growth factors that can accelerate bone healing.⁵ The present case report describes the management of an expansile and large periapical lesion.

Case Report

A 24 year old male patient reported with an asymptomatic swelling in his lower right back tooth region which gradually increased in size for the past 6 months. The patient had undergone orthodontic treatment 9 years back, for which all his first premolars were subjected to therapeutic extraction. On Extra oral examination an unilateral swelling was present above the right lower border of the mandible. On Intra oral



Fig. 1: Pre-operative image showing intra-oral swelling in the 43 region



Fig. 2: Intra-oral radiograph showing the presence of apical radiolucency involving the tooth

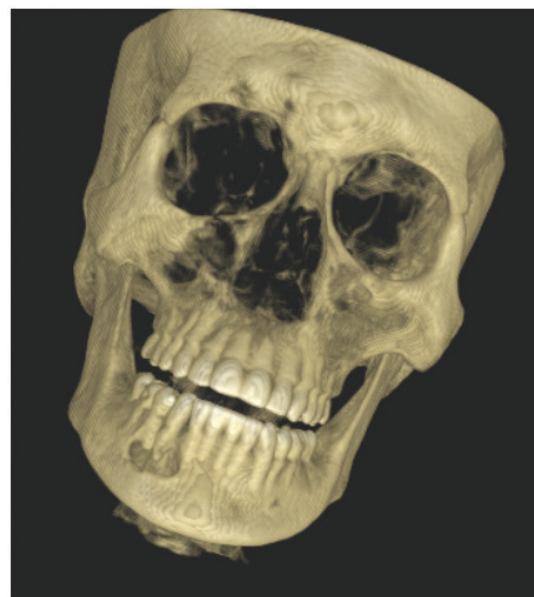


Fig. 3: Cone Beam Computed Tomography image

examination a firm, raised, well circumscribed swelling was present. It extended horizontally from the mesial aspect of mandibular right canine (43) to the mesial aspect of mandibular second pre-molar (45), and vertically from the attached gingiva to the vestibular sulcus measuring about 3x4cm. On clinical examination discolouration was seen in 43. On palpation, the swelling was non-tender with smooth surface texture. The teeth were non-tender to percussion. Electric pulp test (Dentsply, Maillefer Ballaigues, Switzerland) and cold test (Endo Frost, RoekoGmbh and Co, Langenau, Germany) were performed. 43 elicited no response whereas 45 gave delayed response.

On Intra-oral Periapical radiographic examination, a well defined radiolucency was appreciated at the apical portion extending from the mesial aspect of 43 to the distal aspect of 45. A scooped out radiolucency was present in the tooth root of 43 at the apical third (mesio-lateral aspect) indicative of external root resorption. Based on patient's history, clinical and radiographic findings, a differential diagnosis of periapical cyst, periapical granuloma and Ameloblastoma was given. Conventional root canal therapy followed by surgical intervention was planned. The procedure was explained to the patient and a written consent was obtained.

The patient was advised Cone Beam Computed Tomography (CBCT)(Kodak 9000 3D, Carestream Health Inc., Rochester, NY, USA). In the longitudinal slices of CBCT, the lingual cortical plates were intact, but breaching of the buccal cortical plate pertaining to 43 and 45 was present. Further, loss of continuity of the buccal cortical plate was seen in the transverse sections. In the first visit, endodontic therapy was initiated under rubber dam (Hygienic, SPN Dental, Maharashtra, India) isolation. Access cavity was prepared in tooth no. 43 and 45. Copious irrigation with 5.25% NaOCl (Prime Sodium Hypochlorite, Prime Dental Products Pvt Ltd., Bhiwandi, Maharashtra, India) was done. Working lengths were determined using Ingles method. Calcium hydroxide (Prime Dental RC Cal, Prime Dental Products Pvt Ltd., Bhiwandi, Maharashtra, India) dressing was given and the cavities were temporized with Cavit (Cavit-G, 3M ESPE AG, Seefeld, Germany).

The patient was recalled after a week. In the second visit, canals were irrigated with 5.25% NaOCl. Cleaning

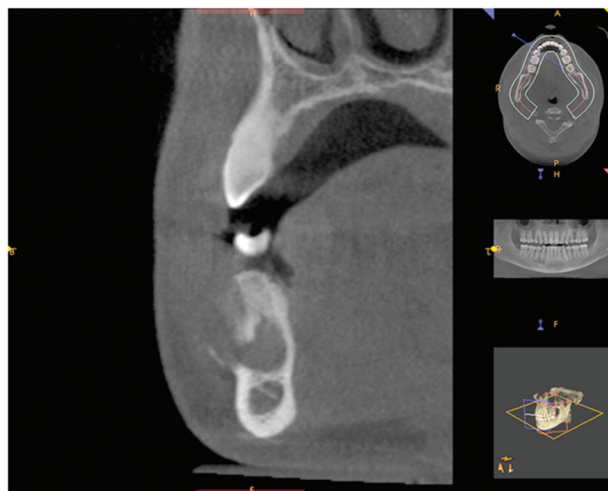


Fig.4. Cone Beam Computed Tomography image



Fig.5. Surgical enucleation



Fig.6. Post-operative radiograph of the tooth with apical resection

and shaping was done using the step-back method. Master cone of size 50 was selected. Obturation was done by cold lateral compaction method. Sulcular incision was placed from 42 to 46 using Bard Parker blade No.15 (Bard-Parker, Aspen Surgicals, Caledonia, France) and vertical incisions were placed mesial to 46 and distal to 42 under local anaesthesia (Lignox, Indoco Remedies Ltd, India). A Full thickness rectangular mucoperiosteal flap was elevated. The margins of the bony defect was smoothed and rounded using a slow speed bone cutting bur No.703 (Bur Carbide, SS White, New Jersey, USA). The buccal cortical plate adherent to 43 was retained. Granulation tissue was curetted using Molt curettes (Hu-Friedy Mfg. Co., Chicago, United States). Root ends were resected at zero degree angulation. Root ends of 43 and 45 were approached lingually and cold burnishing was done. The external root resorptive defect pertaining to 43 was restored with intermediate restorative material (Zinc oxide eugenol, Dentsply Caulk, Maillefer Ballaigues, Switzerland). PRP was obtained from the autologous blood. Fresh bleeding was induced using a sterile spoon excavator (GDC marketing, Punjab, India) and PRP was placed. Flap was repositioned and simple interrupted sutures with nylon suture size 3-0 (Ethicon Inc. Johnson and Johnson pvt Ltd., New Jersey, USA) were placed following haemostasis. Histo-pathological examination confirmed the excised tissue to be a periapical granuloma. Post-operative instructions were given to the patient and medications were prescribed.

|| Discussion

Multiple diagnostic aids are available to diagnose periapical lesions. However, till date, histo-pathological evaluation may be the only available investigation to provide the confirmatory diagnosis. Therefore, post-hoc biopsy may be considered the sole reliable method of diagnosis.¹ In this case an apparently asymptomatic swelling involving 43 and 45 with no definitive aetiology has caused extensive bone loss. Hence, the need for biopsy becomes essential for a final diagnosis. Since excisional biopsy is a treatment modality by itself, root canal treatment of involved teeth followed by surgical excision of the lesion was done.⁶ An island of bone was left on the buccal aspect of 43 in order to maintain the tooth anchored. Furthermore, the external root resorptive defect seen on apical third

of 43 could only be treated via surgical retrograde approach. Schour⁷ stated that "The formation of a granuloma is indicative of a defence reaction on the part of the periapical tissue. It may occur in the absence of infection." The pathology can arise as a result of trauma. In this case the reason could possibly be due to the orthodontic treatment where the rapid force applied could have led to root blunting and formation periapical lesion. To assess the extent of resorption created by the periapical pathology in the alveolar bone, an advanced 3D imaging system like CBCT was advised. CBCT imaging is considered as a superior pre-operative diagnostic aid because it could provide numerous axial, sagittal and transverse views in a short time.

Moreover, CBCT could also be useful in identifying the type of lesion based on the grey scale values to a certain extent.⁸ Hence, a CBCT might be particularly useful in this case where an asymptomatic swelling associated with a firm tooth with no obvious aetiology was encountered. CBCT may be desirable prior to an endodontic surgery to visualize the proximity of vital structures to the tooth root, to assess density and depth of destruction in buccal and lingual cortical plates caused by a pathology.^{9,10} Endodontic surgery is considered to be a success only when regeneration of the affected tissue is achieved. Placing the PRP produced by gradient density centrifugation of the patients own blood in the defect site may provide a fibrin glue rich in cytokines. The obtained PRP has an eight fold increase in platelets with abundant growth factors. The supra-physiological concentration of platelets endowed with cytokines expedites wound healing and also augments bone formation.⁵ Thus in the current study PRP was placed at the osseous defect site to hasten healing and improve the bone formation.

|| Conclusion

In this clinical case report, an apparently non-aggressive pathological condition ultimately led to extensive osseous defect that could have resulted in dental impairment if not surgically intervened. The periapical lesion was successfully managed by surgical intervention along with the root canal treatment of the involved teeth.

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