Title: Effect of unintentionally periapically extruded metapex paste in mandibular premolar – A Case Report

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Abstract: The case of a premolar tooth with a periapical lesion and the usage of Metapex are covered in the study. During application, there was an unintentional extrusion of Metapex. At 12 months, the patient had his periapical healing assessed. The investigation showed that the unintentional protrusion of the metapex had negative impact on the periapical healing. However, the inclusion of BaSO4 and iodoform in comparison to ordinary Calcium hydroxide may be responsible for the delayed resorption of Metapex and healing of the periapical lesion.

Keywords: Bone Graft, Periapical Lesion, Ca(OH)₂ Calcium Hydroxide.

Introduction: The main goals of endodontic therapy are to prevent and cure pulpal and periradicular infections. It is evident that the success of endodontic therapy depends on the decrease or eradication of bacteria given their significance in the aetiology of periradicular diseases. Root canal disinfection may be thought of as requiring thorough chemo-mechanical preparation. Intracanal medications may aid in the eradication of surviving bacteria by staying in the root canal in between treatments.(1)

Case Report

A 19-year-old, systemically healthy male patient reported to the Department of Conservative Dentistry & Endodontics with the chief complaint of acute pain and burning sensation in the vestibular area of left lower posterior teeth in the past 3 months. Extraoral examination revealed a swelling on left side of face along the mandible. The skin over the area was tense and warm. A red, inflammatory area was seen in the buccal gingiva near the apices of the left mandibular first and second premolars (34 and 35 respectively) which was sensitive to palpation. There was a history of trauma in the left mandible approximately 1 year back for which he had undergone surgery and plating. Few months after the surgery, he consulted a general practitioner for pain and an "opening" in relation to 34, 35 in the buccal sulcular region. The consulting practitioner

initiated root canal therapy for 35 after which the patient developed swelling, pain and a tingling sensation in the left lower premolar region. The panoramic view radiograph the patient had brought with him revealed a dense radiopacity in the periapical area of 35 extending up to the mandibular nerve. The prescription of previous dentist confirmed that a "metapex" dressing was given in tooth 35.



Fig:1 Pre-operative Image



Fig:2 Pre-operative OPG

The canal of tooth 35 was gently irrigated with normal saline and patency was confirmed. The patient was put on antibiotics (Cephalexin 500mg twice daily), anti-inflammatory (diclofenac+ serratiopeptidase twice daily) for 5 days. Additionally, antioxidants tablets (Geriforte twice daily) were prescribed for 15 days. At the 15-day recall visit, the patient reported with reduced pain and swelling, but the tingling sensation still persisted for which the patient was again prescribed antioxidants for another 15 days. When patient visited with still persisting altered sensation, it was planned to remove the radiopaque mass surgically. A full thickness, mucoperiosteal triangular flap was raised extending from distal surface of 33 to distal surface of 36 which revealed a round bone defect in relation to apex of 35. Small white granular pieces of a whitish materials were removed from the defect with the help of curettes and spoon excavators. The canal was laterally condensed with size 50 gutta-percha and accessory cones using lateral cones. The defect was debrided with normal saline and filled with a hydroxyapatite bone graft and the flap was sutured with black silk sutures. Antibiotics (Amoxicillin 500mg thrice daily), anti-inflammatory-analgesics (diclofenac sodium+ paracetamol twice daily) and multivitamins were prescribed. The patient was instructed about maintenance of oral hygiene and recalled after a week. On follow up visit patient reported a reduction in the burning and tingling sensation.

Sutures were removed and patient was recalled after one month. On his 6-month recall visit the patient reported asymptomatic and his radiographic examination showed signs of periapical bone healing.



Fig:3 Curettage of Lesion



Fig :4 Removed granulated tissue and periapically extruded metapex paste







Fig:6 12 Months follow up radiograph

Discussion: The majority of endodontopathogens cannot thrive in calcium hydroxide's very alkaline environment. Since calcium hydroxide has a pH of around 12.5, some bacterial species that are frequently seen in infected root canals are quickly destroyed when in contact with it. Calcium hydroxide's antimicrobial action is correlated with the release of hydroxyl ions in aqueous environments. The extremely reactive free radicals known as hydroxyl ions react with a variety of biomolecules.(1)

The powder, a vehicle, and a radio-opacifier are combined to form a Ca(OH)2 paste that is used in endodontics. Ca(OH)2 does not have radiopacity and is difficult to see radiographically when combined with any of the vehicles (aqueous, viscous, or greasy). In order to identify lateral and accessory canals, resorptive defects, fractures, and other features, radiopaque materials, such as barium sulphate [BaSO4] and bismuth, as well as other compounds containing iodine and bromine, are typically added to the paste.(2) However, it has been suggested that a Ca(OH)2 combination in apexification instances be utilized without the inclusion of a radiopaquer since Ca(OH)2 washout is assessed by its relative radiodensity in the canal during follow-up sessions.(2)

There are more soluble radiopaque chemicals that can be used as replacements, the majority of which contain iodine. An aqueous solution containing 10% iodine and 20% potassium iodide is one of the radiopaque substances used in dentistry. This solution has the ability to combine with Ca(OH)2, but if extruded past the apex, it would presumably be quite unpleasant. In actuality, 4% iodine-potassium iodide solutions were cytotoxic and inflammatory.(3)

The deliberate placement of Ca(OH)2 beyond the boundaries of the root canal and into the periradicular tissues has also been advocated, even though during root canal treatment Ca(OH)2 dressing material may occasionally unintentionally escape through the apex of the tooth if there are large and chronic periapical lesions present. Some hypothesize that this directly affects inflammatory tissue and the linings of epithelial cysts, favors periapical healing, and promotes osseous repair.(4)

However, because to the potential harm caused by periapical extrusion of Ca(OH)2, such purposeful overextension is not often recommended. Reports of persistent inflammatory reactions and bone necrosis in perforation cases (5), the neurotoxic effects of root canal sealers (6),cytotoxicity on cell cultures (7), damaged epithelium with or without cellular atypical when applied on hamster cheek pouches (8), cellular damage after early Ca(OH)2 dressing of avulsed teeth (9), and necrosis of buccal gingiva and mucosa after periradicular overextension caused by alkaline burn have been presented.(10)

Conclusion: 12 months later, the patient was visited, and periapical healing was assessed. After all of the periapically extruded metapex paste had been surgically removed, it was then noticed that the periapical lesion had totally vanished. According to the case study that is being presented, using Ca(OH)2 paste that contains BaSO4 as an intracanal dressing and extruding it through a periapical lesion connected to pulpless teeth had negative effects. Since healing may take longer when using Ca(OH)2 paste that contains BaSO4, deliberate overextension is not advised.

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