

## Case Report

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# An uneventful effect of accidental extrusion of excess sealer on periradicular healing: Two case reports.

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### ABSTRACT

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Accidental extrusion of sealer has been questioned regarding its fate, tissue reaction, and subsequent effect on the root canal seal and periradicular healing. These case reports demonstrate, radiographically, almost disappearance of excess sealer which has been expressed into the periradicular tissues during obturation and subsequent healing of periapical tissues despite this additional irritation.

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### Introduction:

All of the commercial root canal sealers are toxic, irritate periradicular tissue, causing extensive to moderate tissue damage as soon as they escape through the foramen<sup>1</sup>. Periradicular tissue reaction to the sealers will at first be inflammatory, but as the cements reach their final set, cellular repair takes place unless the cement continues to break down, releasing

one or more of its toxic components exhibited persistent chronic inflammatory responses<sup>2</sup>. Periradicular necrosis by the sealer, if allowed to escape from the canal, may be due in part to an infarct caused by pressure obstruction of the region's vessels<sup>3,4</sup>. Necrosis of the periodontal ligament provoked necrosis in the adjacent cementum and alveolar bone as well. There was also a greater tendency toward epithelial proliferation and cyst formation in the overfilled group<sup>2</sup>. When foreign body is not too irritating, it becomes either resorbed by phagocytes or encapsulated by collagen fibers<sup>3</sup>. In the rat, the periodontal

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ligament regenerated within 7 days if toxic irritation did not continue<sup>1,3</sup>. At the same time, if the canal is properly cleaned and shaped, and obturated three-dimensionally, there should be significant healing of the periradicular tissues. The present report describes, radiographically, dissolution of extruded sealer in the periradicular tissues with subsequent osseous repair which was similar to healing in periradicular tissues where there was no extruded sealer.

### **Case report 1**



Fig-1: Initial X-ray with periapical lesion



Fig-2: Working length measurement Xray



Fig-3: Final X-ray with sealer extruded into periapical lesion



Fig-4: After 6 month

### **Case report 1**

A 18-years old male patient presented with a non-contributory medical history, a chief complain of intermittent diffuse pain in his maxillary incisor region and recently developed moderate pain in the same

aspect. There was a history of trauma from road traffic accident.

Clinical examination revealed crown fracture with loss of mesio-incisal angle from left maxillary central incisor. Moderate tenderness and dullness found to percussion on the maxillary left central incisor.

Radiographic examination revealed the presence of radiolucencies around the apex of maxillary left central incisor. The pulps were diagnosed as necrotic with chronic to subacute periapical periodontitis. Access was gained to the canals and working length was measured, which was cleaned and shaped with appropriate number of K and H file. The canal was cleaned with 1% sodium hypochlorite solution, dried and obturated with laterally-condensed gutta-percha and Sealapex-a calcium hydroxide containing root canal sealer. During obturation of the tooth, the sealer, Sealapex, was extruded beyond the apex. The patient occasionally complained some discomfort, which gradually declined and had no symptoms after 18 months. The 18-month recall exhibited significant reductions in the size of radiolucencies and almost disappearance of sealer. (Fig: 1-6).



Fig-5: After 12 month



Fig-6: Disappear of periapical Lesion and sealer after 18<sup>th</sup> months

## Case report 2



Fig-7: Initial X-ray with periapical lesion

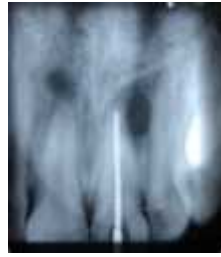


Fig-8: Working length measurement X-ray



Fig-9: Final X-ray with sealer extruded into the periapical lesion of rt. max. central incisor



Fig-10: After 6 months



Fig-11: After 12 months



Fig-12: After 18 months



Fig-13: Disappear of periapical lesion and sealer After 24 months

## Case report 2

A 32-years old female patient presented with a non-contributory medical history, a chief complain of intermittent diffuse pain in her maxillary incisor region. There was a history of trauma five years ago.

Clinical examination revealed discoloured maxillary central incisors with a discharging sinus was present at the apex of right central incisor tooth. Mild

tenderness and dullness found to percussion on the both maxillary central incisors.

Radiographic examination revealed the presence of radiolucencies around the apex of both maxillary central incisors. The pulps were diagnosed as necrotic with chronic periapical abscess. Access was gained to the canals and working length was measured, which were cleaned and shaped with appropriate number of K and H file. The canal was cleaned with 1% sodium hypochlorite solution, dried and obturated with laterally-condensed gutta-percha and zinc-oxide eugenol root canal sealer. During obturation of the tooth, the ZOE sealer was extruded beyond the apex of right central incisor. The patient complained a small swellings at the apex of the tooth and little discomfort at the next visit, after one month. The patient was examined and observed swelling was due to blockage of sinus by extruded sealer. Sinus was curetted, first sealer then blood came out through the sinus, antibiotics was given and after 7 days sinus healed up. The patient occasionally complained some discomfort during healing period, which gradually declined and had no symptoms after 24 months. The 24-months recall exhibited significant reductions in the size of radiolucencies and almost disappearance of sealer. (Fig.7-13).

### **Discussion:**

The present report describes radiographically, gradual dissolution of accidental extrusion of excess sealer from the periradicular tissue. In a similar type of

study Gutmann JL and Fava LRG<sup>5</sup> found that macrophage debridement process and possibility of residual sealer particles apparently did not adversely affect the course of periradicular osseous repair, as the region without extruded material responded in a similar manner radiographically to the tissues containing sealer. While it is not advocated that sealer be routinely placed beyond the confines of the root canal system<sup>5</sup>, it can be observed that tissues will heal despite this additional irritation. This favourable response is probably based on multiple factors, such as canal cleanliness i.e. proper biomechanical preparation<sup>6</sup>, the nature of the sealer and its physiological effects on the surrounding tissues, seal of the canal system i.e. hermetic obturation, and host response. In another study, Erasquin and Muruzabal found that all of the cements, if the canal was overfilled showed a tendency to be resorbed by phagocytes<sup>1,2</sup>. In comparing the various sealers, straight zinc-oxide eugenol cement was highly irritating to the periradicular tissues and caused necrosis of the bone and cementum<sup>7</sup>. Inflammation persisted for 2 weeks or more. Finally, the ZOE became encapsulated. Much the same inflammatory reaction was observed at the US National Bureau of standards when monkey teeth were overfilled with ZOE cement<sup>8</sup>. Zemner et al.<sup>9</sup> demonstrated significant macrophage response to sealapex within silicon tubes implanted in the subcutaneous tissue of rats. Foreign body giant cells containing dark particles in their cytoplasm were noted adjacent to the material also distant from the

implantation site. Even at the 90-day observation, macrophages and foreign body giant cells with significant amounts of engulfed material persisted at the ends of silicone tubes. The majority of the specimens showed some degree of granulomatous tissue invagination into the lumen of the tubes. Similar responses to sealapex were shown by Tornstad et al.<sup>10</sup> when the material was placed in intraosseous Teflon cups. A severe macrophage reaction was evident, with removal or dissolution of the material from the cups. In addition, an ingrowth of connective tissue was observed. This same tissue response was verified by Soares et al.<sup>11</sup> in the periradicular tissues of dogs' teeth. By contrast, Sonat et al.<sup>12</sup> demonstrated pronounced periradicular healing when teeth were obturated with gutta-percha and sealapex. Minimal areas of inflammation were present, together with significant cemental apposition, bone formation and periodontal fiber organization. In another study, South American group reported on dog periradicular specimens overfilled with Sealapex, CRCS and ZOE. All responded with chronic inflammation.<sup>11</sup> While depending upon the nature of the sealer and canal cleanliness, accidental extrusion of sealer could result in either a productive or destructive response in the periradicular tissues. So long-term follow-up is indicated.

### **Conclusion:**

This case highlighted radiographically, that accidental extrusion of sealer does not

mean failure of non-surgical root canal treatment and requirement of surgical procedure such as apical curettage or apiosectomy followed by retrograde filling, as periapical tissues will heal despite this additional irritation. Though the study performed clinically and radiologically, a histological evaluation is necessary to reach a sound conclusions.

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