# Management of a Massive Resorptive Lesion with Multiple Perforations in a Molar: Case Report

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## Abstract

Internal resorption is usually asymptomatic. Large resorption defects may result in penetration of the root dentin leading to perforation. In this case report, we describe the diagnosis and nonsurgical repair of a large resorptive lesion with multiple perforations in a mandibular first molar using cone-beam computed tomographic technology. The 3 different root perforations were located in the mesial root and repaired using Biodentine (Septodont, Saint-Maur des Fossés, France). The mesial root weakened from resorption was reinforced by replacing the lost root dentin with calcium silicate–based cement and placement of a glass fiber post. The 18-month follow-up confirmed remineralization of the osseous defect and asymptomatic function of the tooth. A further follow-up at 43 months revealed retention of the tooth and absence of root fracture. Usually, a tooth with multiple perforations and such a severe tooth material loss would have been destined for extraction. However, with contemporary diagnostic techniques such as cone-beam computed tomography and use of advanced biomaterials and root reinforcement methods, such teeth can be salvaged. *(J Endod 2015;41:753–758)*



## Key Words

Biodentine, cone-beam computed tomography imaging, massive resorption lesion, multiple perforations


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Internal inflammatory resorption involves resorption of the intraradicular dentin without deposition of hard tissues adjacent to the site of resorption. It is associated with growth of granulation tissues in the resorbed area. It is usually identifiable with routine radiographs as radiolucency in the center on the root canal (1). Internal resorption is readily identified as a radiolucent, round, symmetrical widening of the root canal space, but all cases of internal root resorption may not progress in a similar fashion. Asymmetrical shapes may also be found (2, 3).

Internal root radiolucencies are not detectable on radiographs at their early stages. In cases of large perforating resorptive lesions, the 2-dimensional image using standard radiography may not be able to completely outline the lesion. In cases of multiple root perforations, location and associated root destruction may not be clearly visible on intraoral periapical radiographic projections. Recently, cone-beam computed tomographic (CBCT) imaging has been shown to be helpful in an accurate diagnosis of such lesions (4). The use of CBCT imaging provides a 3-dimensional appreciation of the resorption lesion with axial, coronal, sagittal views of the internal anatomy, allowing assessment of the true extent of the lesion. High sensitivity and an excellent specificity are obtained when serial cross-sectional views are analyzed to determine the size and location of the resorption (5). Durack et al (6) found small volume CBCT imaging to be a reliable method of detection of small and large simulated external inflammatory resorption lesions.

Nonsurgical root canal therapy is the treatment of choice to arrest the destructive process in the absence of concomitant external resorption (1). Thorough debridement and obturation of the irregular resorptive cavity is a challenging task (7). Mineral trioxide aggregate (MTA) has been widely used for the treatment of root perforations. It has a good sealing ability, induces osteogenesis and cementogenesis, and is highly biocompatible (8–10).

Biodentine (Septodont, Saint-Maur des Fossés, France), a contemporary tricalcium silicate–based dentin replacement material like MTA, has been evaluated for various physical and biologic properties (11–15). It offers advantages over MTA like a faster setting time and a higher push-out bond strength at 24 hours (12, 16).

This case report describes the diagnosis and management of a large internal resorptive lesion with multiple perforations repaired using Biodentine.

## Case History

A 25-year-old man was referred to the department by his family dentist for endodontic treatment of his mandibular left molar. Clinical examination showed that the mandibular left first molar had large temporary restoration and was slightly tender to percussion. The patient had visited a local dental clinic 2 weeks prior because he had pain in the mandibular first molar and an emergency root canal opening of the tooth had been performed by the referring dentist.

Tooth #19 was tender to percussion. The periodontal condition was normal, with a probing depth within 3 mm and absence of sinus tract. A radiographic examination revealed a large irregular radiolucency in the mesial root canal extending from the pulp chamber to the middle third of the root involving the pulp chamber floor on the mesial aspect. Because of the large size and complexity of the resorptive lesion, the true size and extent of the lesion could not be evaluated using conventional radiographs. The patient was sent for CBCT examination.

CBCT imaging of the mandible was performed by using a CBCT scanner (Planmeca ProMax 3D Classic; Planmeca Oy, Helsinki, Finland). The involved tooth was focused, and the morphology was recorded in axial sections of 0.5-mm thickness. The cross-sectional view was recorded through the long axis of the mesial root of tooth #19 at a 0.3-mm slice interval and 0.2-mm slice thickness. The CBCT images revealed internal root resorption of the chamber involving the mesial wall of the root and extending apically up to the middle of the root length. Three perforations were observed in the mesial root: one on the mesial wall, one on the buccal wall, and one in the furcation area (Fig. 1*A–C*). The lesion appeared to extend along the root canal involving the mesiolingual aspect of the mesial root. A single canal was observed in the mesial root (Fig. 2).

Based on these findings, root canal treatment was initiated. Treatment procedure was explained to the patient, and informed consent was obtained. The tooth was isolated using a rubber dam and Kool Dam (Pulpdent Corp, Watertown, MA). The temporary dressing was removed. The tooth revealed a large resorptive crater with no evidence of any root caries or iatrogenic bur marks (Fig. 3). There was bleeding from the perforation sites on the mesial wall and in the furcation area. The working length was determined radiographically, and the canal was cleaned, shaped, and irrigated with 2.5% sodium hypochlorite (NaOCl) and the Endoactivator System (Dentsply Maillefer, Ballaigues, Switzerland) to activate sodium hypochlorite and enhance its tissue dissolution. After the bleeding was controlled, calcium hydroxide paste (RC Cal Prime Dental Products, Thane, India) was placed in the canal for 3 weeks. This allowed complete canal disinfection and dissolution of any tissue remnants left in the resorption site.

A master cone was selected for both canals (Fig. 4). The master cone was measured to the desired length in the mesial canal to obturate apical to the level of resorption. The master gutta-percha cone was partially sectioned with a no. 11 surgical blade (AOV International, B-5, Sector- 59, Noida, Uttar Pradesh, India), allowing an incomplete separation with the remaining gutta-percha. The canal was coated with AH Plus Sealer (Dentsply DeTrey, Konstanz, Germany) apical to the desired level of obturation with a reamer. The master point was tried in the canal to ensure there was no extrusion of sealer into the resorption crater. The resorption area was also protected with moist cotton pellets. The master cone was placed in the mesial canal, and the apical section of the master cone was separated from the remaining cone by 3 to 4 clockwise rotations until it separated. The gutta-percha was condensed, and excess gutta-percha was removed with a heated spreader.

Biodentine was carried to the resorption crater with the help of an amalgam carrier and condensed with endodontic pluggers in depth of the crater to seal all 3 root perforations. Once the Biodentine had set, the post space was prepared using a custom Precision drill no. 5 (Easy Post

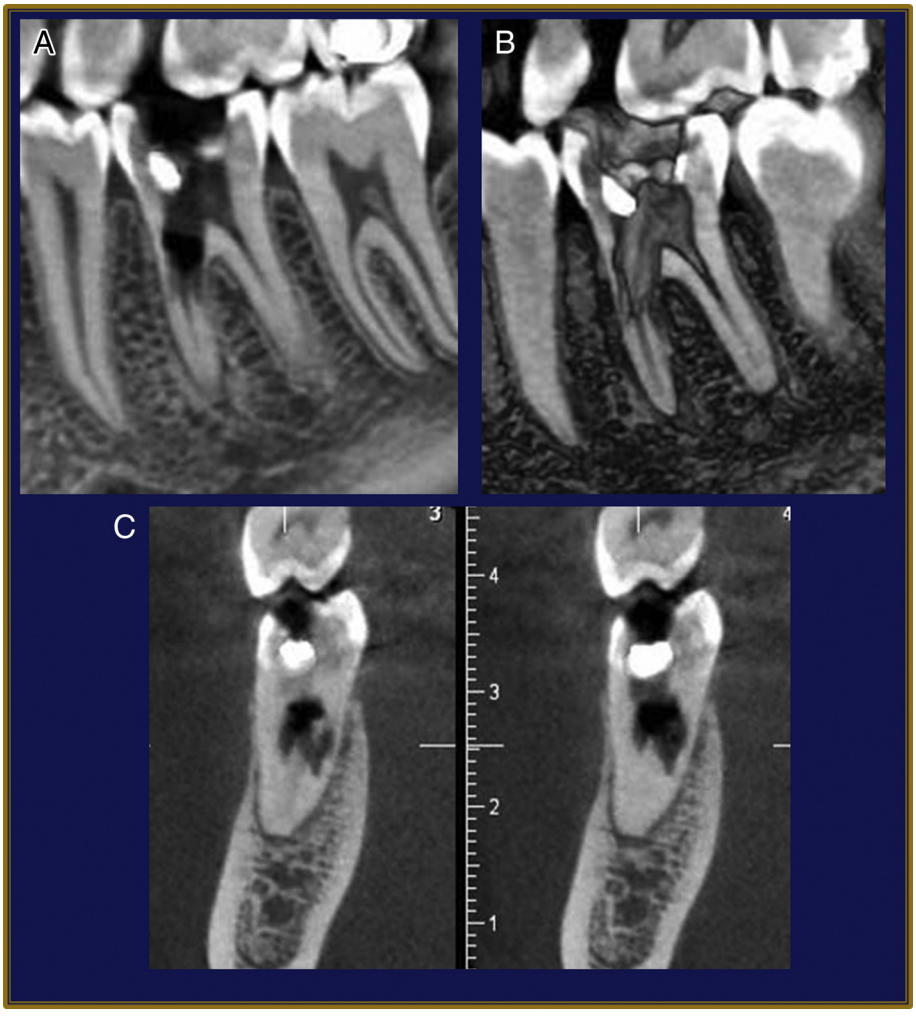


**Figure 1.** (*A*) The sagittal view through #19 showing extent of the resorptive lesion and the associated perforation of the furcation area. (*B*) Three-dimensional reconstruction of the pulp chamber. (*C*) The coronal view through the mesial root of tooth #19 showing the extent of root resorption.