Internal Root Resorption Repair With A Bioceramic Sealed Endodontic Stabilizer  
A Case Report  
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Introduction
Internal Root Resorption (IRR) is an inflammatory phenomenon that employs native odontoclasts to resorb intraradicular dentin by a mechanism similar to bone resorption. 1 In deciduous teeth, this clastic activity is adaptive and allows for the timely exfoliation of the primary tooth crown. However, in permanent teeth the progressive resorption of intraradicular dentin is a pathologic process that can result in loss of root strength and eventual tooth loss if not intercepted by the Dentist. 2
IRR is a rare clinical entity. It is more common in men than in women, involving the maxillary incisor most frequently and is often associated with a history of trauma to the area. IRR progresses asymptptomatically in its early stages at which time it is only detectable by radiography. It is often only after root perforation and subsequent bacterial infection that the first clinical signs become evident. Patients will describe symptoms of acute odontogenic infection including pain, tenderness to percussion, tenderness to palpation, mobility, swelling, or drainage. By the time these signs and symptoms are present, resolution of the pathosis by routine endodontic treatment is often impossible.3 The following case report outlines a novel therapeutic approach for treating cases of severe internal resorption.

Initial Exam 4/21/2010
A 56-year-old male was referred to the IUSD Graduate Endodontic clinic for evaluation of tooth #9. The patient reported a 1-year history of periodic swelling, drainage and mild pain in the labial attached gingival adjacent to tooth #9. The patient’s medical history was noncontributory. The patient stated that he had been instructed by his dentist to have tooth #9 extracted a year prior, but refused to comply and was emphatic that he wanted to save his tooth if at all possible. The intraoral exam was unremarkable. The intraoral exam revealed an unerupted tooth #9. Class I mobility, periodontal probing depths <3mm, and a small, 2 mm sinus tract in the labial gingiva at the midroot level of tooth #9. Radiographic exam showed a 4 mm x 5 mm midroot radiolucency obscuring the canal spaces with lateral root rootcency (Fig. 1). A Cone Beam Computed Tomography (CBCT) was obtained to determine the extent of the resorptive destruction and the position of the tooth in the alveolus (Fig 2 & 3). The CBCT clearly shows a midroot perforation.

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The patient was informed of the presence of the resorption and associated perforation, and advised that nonsurgical endodontic treatment and traditional surgical perforation repair was not indicated due to the extent of the resorption. The patient was advised that the most predictable treatment option would be the extraction of tooth #9 with placement of an endosseous implant. At this suggestion, the patient was emotionally distraught and asked, “Isn’t there anything we can do to keep this tooth?” The suggestion was made to surgically resect the portion of the root apical to the resorptive defect, and then compensate for the resultant poor crown:root ratio by placing an endodontic stabilizer. The patient reviewed and signed the informed consent and scheduled for surgical root resection with an endodontic stabilizer.

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Rubber dam isolation of tooth #9 was completed. Non-surgical debridement of the root canal space was completed to the level of the resorptive defect as determined with radiographs and an electronic apex locator. Instrumentation was completed to a sufficient diameter to accommodate the endodontic stabilizer. Irrigation of the root canal space was accomplished using 2.0% chlorohexidine gluconate and sterile saline. After the completion of non-surgical root canal debridement, a full-thickness mucoperiosteal flap with vertical releasing incisions was raised from the distal of tooth #9 to distal of tooth #10. Upon reflection of the surgical flap, a 3 mm round, granulation tissue filled fenestration of the labial cortical plate was observed over the midroot of tooth #9. A straight surgical handpiece with sterile saline irrigation was used to enlarge the ostotomy. Granulation tissue was curetted from the surgical crypt, and the portion of the root apical to the resorptive defect was resected. Preparation of the canal space and alveolar bone was completed with endodontic stabilizer preparation drill at slow speed with sterile saline. The endodontic stabilizer was then trial-fit in the prepared canal and osteotomy prior to cementation and grafting (Fig. 4). A radiograph was taken to ensure proper endodontic stabilizer positioning. The endodontic stabilizer was then trimmed to length and cemented into canal space with a boned composite resin and sealed with EndoSequence Root Repair Material bioceramic putty. Bone grafting of surgical cyst was completed with demineralized freeze dried bone and covered with a dynamatrix membrane (Fig. 5). The flap was then replaced and sutured, and a post-op radiograph was taken (Fig. 6).

Discussion
Endodontic stabilizers are valuable clinical adjuncts that enable the endodontics to save teeth that would have had compromised crown to root ratios otherwise.4 Some early endodontic stabilizers made from vitallium received criticism for being prone to corrosion and crown-down leakage.5 Long-term clinical success of stabilizers made from titanium that are not prone to corrosion have been reported, but this case study is the first to show the use of a titanium stabilizer sealed with bioceramics.6 This case study indicates that with improvement in materials, endodontic stabilizers can be a valuable adjunct in modern conservative restorative dentistry.

References