

# The Challenges Surrounding Tooth Resorption



ROOT CANAL SPECIALTY  
ASSOCIATES



Root Canal Specialty Associates  
provides care in all phases of surgical  
and nonsurgical endodontics. With  
decades of combined experience, four  
locations, and eleven endodontists,  
we have you covered.

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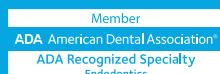
## LOCATIONS

Ann Arbor  
Brighton  
Livonia  
West Bloomfield

## DOCTORS

Dr. Robert Coleman\*  
Dr. Darya Dabiri  
Dr. Steven Edlund\*  
Dr. Martin Goode  
Dr. Wesley Ichescu  
Dr. Alexandra Martella  
Dr. Christopher McWatters  
Dr. Andrew Racek\*  
Dr. Michael Shapiro\*  
Dr. Martha Zinderman

\* Active Diplomate of the American  
Board of Endodontists



# We take our referral partnerships very seriously. Consider us an extension of your team.

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We work collaboratively with our referrers to alleviate pain, save teeth and provide patients with optimal, quality care. In many cases, even a severely compromised tooth can be retained with endodontic treatment.

Root Canal Specialty Associates doctors have extensive experience treating difficult cases (such as internal and external resorption). Our goal is to preserve the natural dentition and we employ both surgical and non-surgical approaches for treating resorptive defects. If you have questions or concerns about treatment options for your patient, our doctors are available for endodontic case consultation whenever you need it.

"I have frequently consulted with Root Canal Specialty Associates doctors over the years. In addition to providing routine endodontic treatment, they have diagnosed and successfully partnered with me to provide optimal care for several patients with internal and external resorptive defects."

**Dr. Robert Borowiec**  
*D.D.S., South Lyon Dental Group*

THE CHALLENGES OF RESORPTION

**Etiology.** It is thought that tooth resorption may occur following injuries to or irritation to the periodontal ligament and/or dental pulp and it is a frequent sequelae following traumatic injuries, orthodontic tooth movement, or chronic infections of the periodontal structures.

**Diagnosis.** There may be no external signs, and the resorptive condition is often detected by routine radiographic examination. Where the lesion is visible, the clinical features vary from a small defect at the gingival margin to a pink coronal discoloration of the tooth crown resulting in ultimate cavitation of the overlying enamel. The condition is usually painless unless pulpal or periodontal infection develops. Radiographic features of resorptive lesions vary from well-delineated to irregularly bordered mottled radiolucencies, and these can be confused with dental caries.

**Treatment.** Resorption can occur as a single entity or a combination of internal and external defects can occur simultaneously on the same tooth. Effective management and appropriate treatment can only be carried out if the true nature, history and exact location of the resorptive defect is known. Cone Beam Computed Tomography (CBCT) has been shown to be an important adjunct for the diagnosis and treatment of resorptive defects.

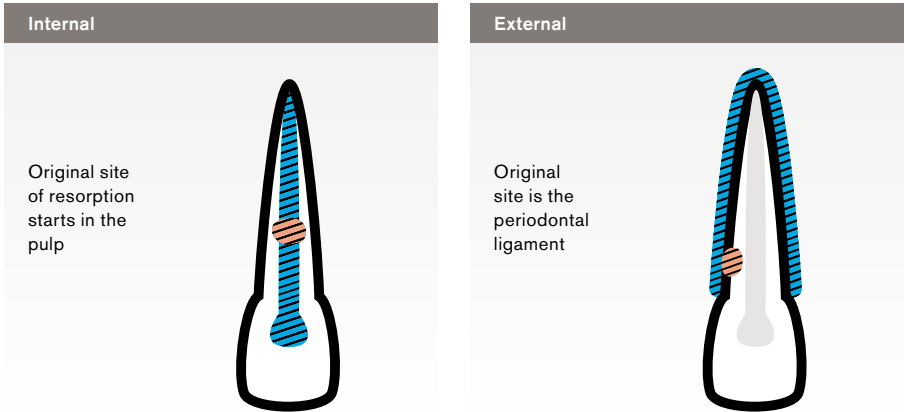
**Classification.** The various types of root resorptive defects have been organized and classified in a variety of ways. In an attempt to eliminate confusion, a clinical related classification system based on stimulation factors has been developed and is outlined below:

RESORPTION CLASSIFICATIONS	
1. PULPAL INFECTION ROOT RESORPTION (internal and/or external)	
2. PERIODONTAL INFECTION ROOT RESORPTION	
3. ORTHODONTIC PRESSURE ROOT RESORPTION	
4. IMPACTED TOOTH OR TUMOR PRESSURE ROOT RESORPTION	
5. ANKYLOTIC ROOT RESORPTION	

To learn more about these classifications, reference the article *“Root resorption – diagnosis, classification and treatment choices based on stimulation factors.”*  
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If you have questions about this complicated condition or treatment options for your patient, our doctors are always available for endodontic case consultation.

## DIFFERENTIATING INTERNAL FROM EXTERNAL RESORPTION



**The following diagnostic features can often help distinguish internal from external resorption in clinical practice:**

### INTERNAL

An internal resorptive lesion appears to be close or continuous with the pulp whatever the angle of the x-ray.

In internal resorption, the outline of the canal is often distorted and the canal and resorptive defect are contiguous.

Internal resorption is rarely accompanied by bone loss around the tooth.

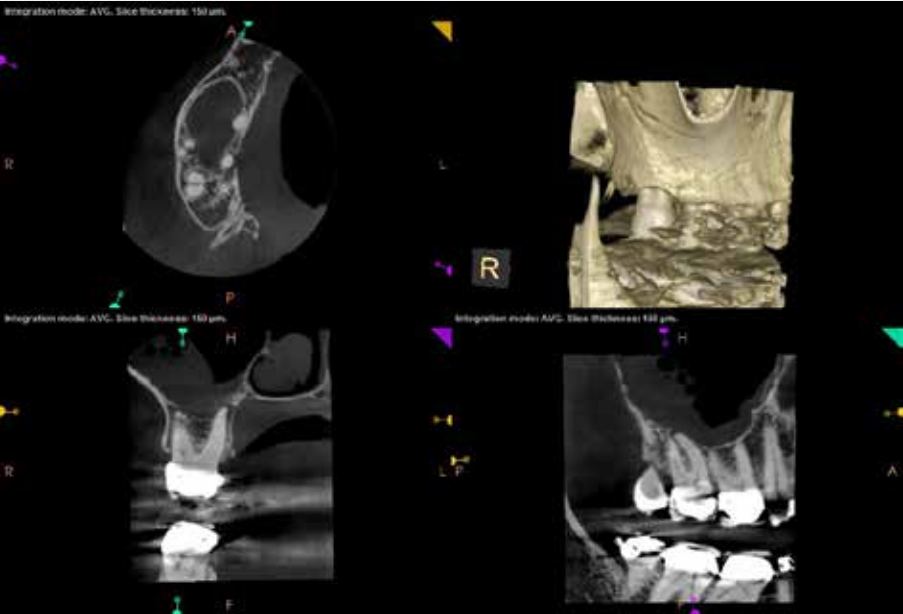
### EXTERNAL

An external resorptive lesion typically moves away from the canal as the angle of the radiograph changes. In addition, the buccal object rule can often help distinguish if the defect is on the buccal or lingual.

When a resorptive defect is external, the root canal outline appears to be normal and can often be seen running through the defect.

External resorption is frequently accompanied by bone loss around the tooth.

# TECHNOLOGY AND BETTER DIAGNOSES



**Cone Beam Computed Technology (CBCT)** – a 3-dimensional imaging technology that helps us make better diagnoses and treatment decisions – is a great adjunct to making an accurate diagnosis of internal versus external resorption. We offer Cone Beam Computed Technology (CBCT) at all four locations:

- Ann Arbor
- Brighton
- Livonia
- West Bloomfield

**If you'd like to hear more about the indications for and benefits of CBCT imaging, call (734) 261-7800 to schedule a time to talk with us.**

## Conventional endodontic treatment with surgical repair of external resorptive defect.

TOOTH #30 | AGE 67



Pre-Op



Conventional RCT Post-Op

### DIAGNOSIS

Patient in good health. Chief complaint of lingering pain to cold and tenderness to palpation over the buccal of #30. Examination revealed #30 to have a symptomatic irreversible pulpitis with external resorption on the mesiobuccal root.

### CHALLENGE

A 6mm pocket was present over the mesiobuccal root in the area of the resorption. The subgingival extent of the resorptive defect will require periapical surgery to repair.

### TREATMENT

Due to the irreversible pulpitis, root canal therapy was completed and the tooth was restored with a bonded core. Flap surgery was completed at a follow-up visit, during which the area was exposed and the defect was cleaned of all resorptive tissue. The defect was repaired with Geristore to allow for gingival reattachment and the area healed uneventfully. The periodontal defect resolved leaving a 3mm probing depth.



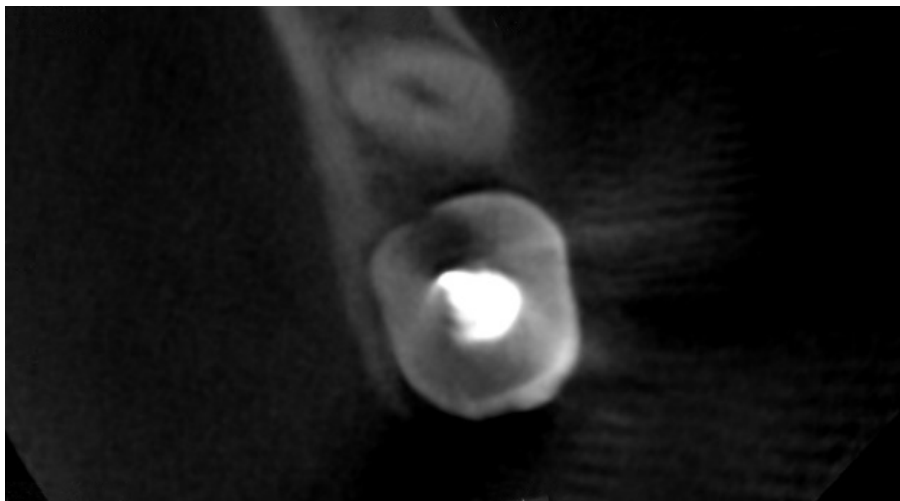
Defect Restored



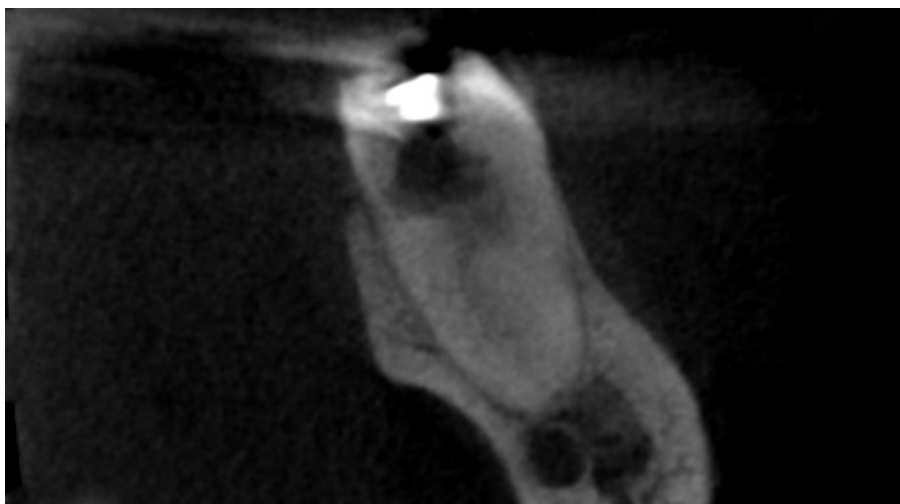
Defect Repaired

Conventional endodontic treatment followed by surgical repair of resorptive defect.

TOOTH #18 | AGE 52



CBCT Axial Slice



CBCT Coronal Slice



**Pre-Op****Post-Op****DIAGNOSIS**

Patient with intermittent pain on the lower left side. Examination revealed what appeared to be extensive external resorption on #18 near the pulp, with lingering pain to cold and pain on percussion consistent with a symptomatic irreversible pulpitis. CBCT showed the defect to be on the mesiolingual aspect, just above the crestal bone and involving the pulp. As the patient was already missing #19, he desired to save the tooth. Prognosis: questionable.

**CHALLENGE**

Due to the pulpal involvement of the resorption, hemostasis and field isolation can be difficult. The location of the defect on the lingual aspect also make surgical correction and restoration difficult.

**TREATMENT**

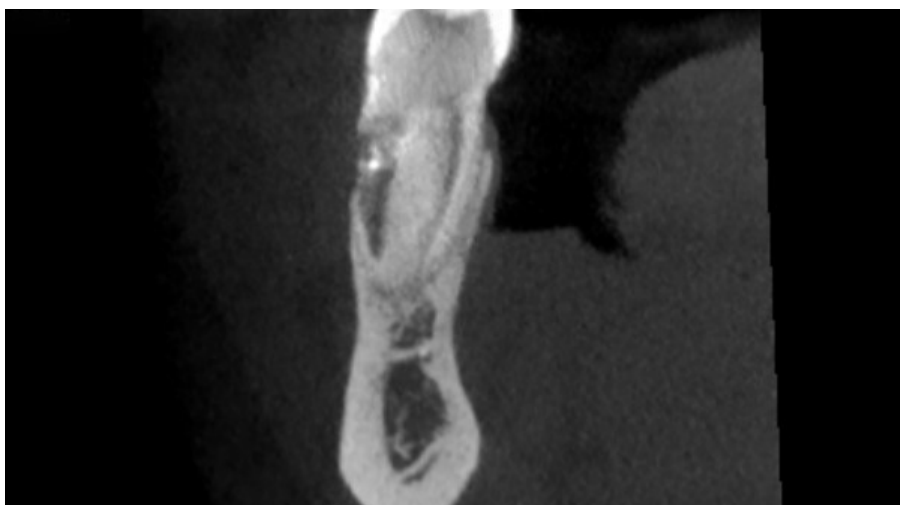
Root canal treatment was completed and a permanent core was placed to seal the defect internally. This was followed by flap surgery, during which the defect was fully repaired with Geristore. A full coverage restoration, with margin replacement on the Geristore, was recommended.

## Conventional endodontic treatment with surgical repair of external resorptive defect.

TOOTH #30 | AGE 47



CBCT Axial Slice



CBCT Coronal Slice

**Pre-Op****Post-Op****DIAGNOSIS**

Patient presented with a history of pain on the lower right. Radiographic examination exhibited external resorption of the mesiobuccal root. Clinical testing showed the tooth to have lingering pain to cold, consistent with a diagnosis of irreversible pulpitis.

**CHALLENGE**

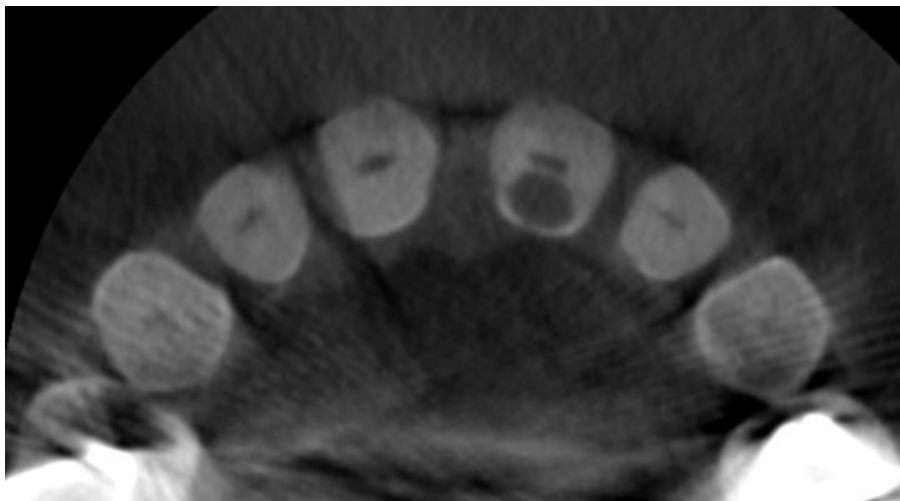
The resorption of the mesial root communicates with the mesiobuccal canal. This makes the endodontic treatment of the mesial root very complicated.

**TREATMENT**

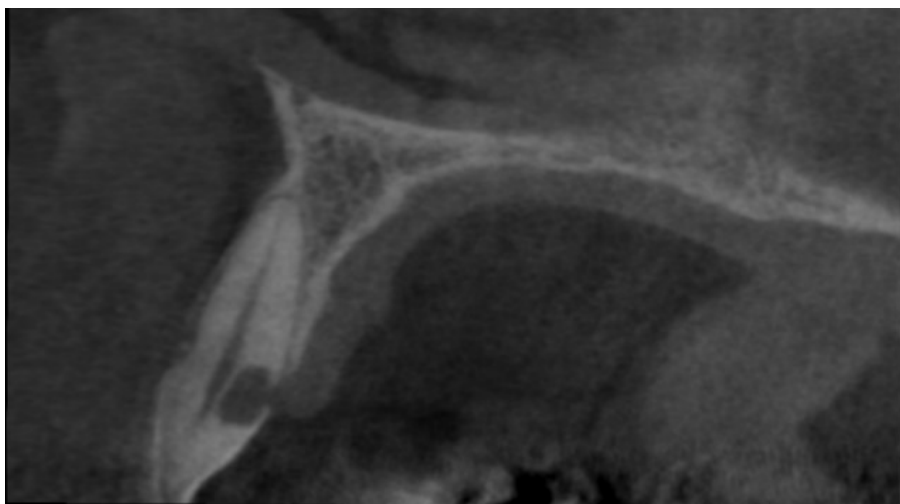
Non-surgical root canal therapy was completed to alleviate the patient's symptoms, and the mesiobuccal root was initially sealed with MTA. Post operative CBCT revealed a large defect on the mesiobuccal root. After placing a permanent core buildup, the area was exposed surgically and was restored with Bioceramic Root Repair Material and Geristore, to allow gingival reattachment.

## Conventional endodontic treatment with internal repair of resorptive defect.

TOOTH #9 | AGE 47



CBCT Axial Slice



CBCT Sagittal Slice

**DIAGNOSIS**

Patient presented with no symptoms. Radiographs and CBCT scan show invasive cervical external resorption.

**CHALLENGE**

The location of the resorptive defect (on the palatal aspect of the root) would make a surgical repair very difficult.

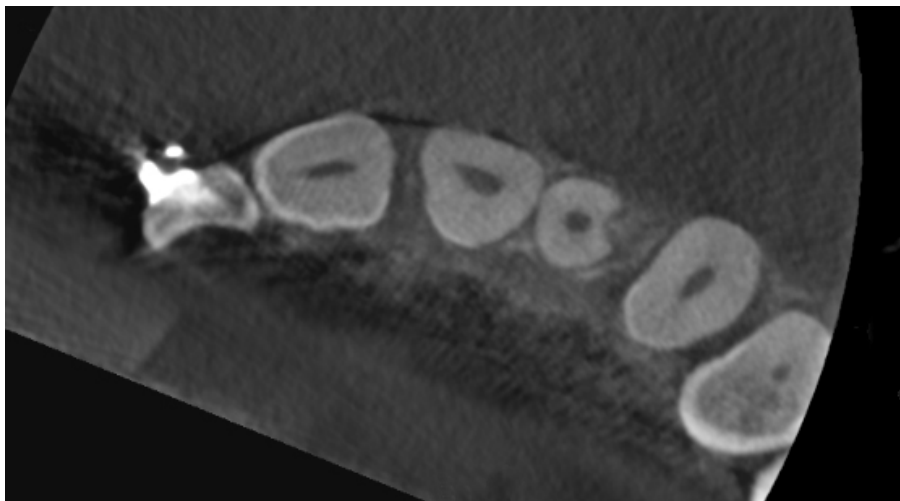
**TREATMENT**

Prophylactic endo completed along with orthograde Geristore root repair. No surgical intervention was needed. Repair was made through the endo access on the palatal side of tooth.

**Pre-Op****Post-Op**

## Conventional endodontic treatment including calcium hydroxide therapy.

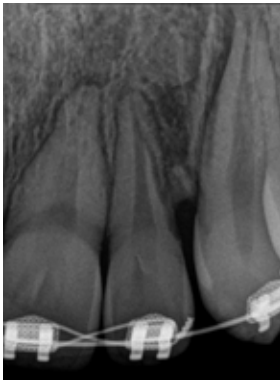
TOOTH #10 | AGE 14



CBCT Axial Slice



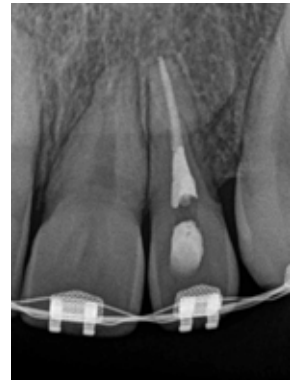
CBCT Sagittal Slice



Pre-Op



Calcium Hydroxide



Post-Op

#### DIAGNOSIS

Patient has had several phases of orthodontic treatment that commenced when he was seven years old. He also had a history of a labially positioned and impacted maxillary cuspid that was surgically exposed and orthodontically moved into position. He had a traumatic injury to his face that resulted in a broken nose. As a part of this evaluation, periapical radiographs and a CBCT scan was taken by an oral and maxillofacial surgeon. These radiographs disclosed extensive external root resorption of tooth #10. Tooth #10 was asymptomatic, vital and exhibited moderate clinical mobility.

#### CHALLENGE

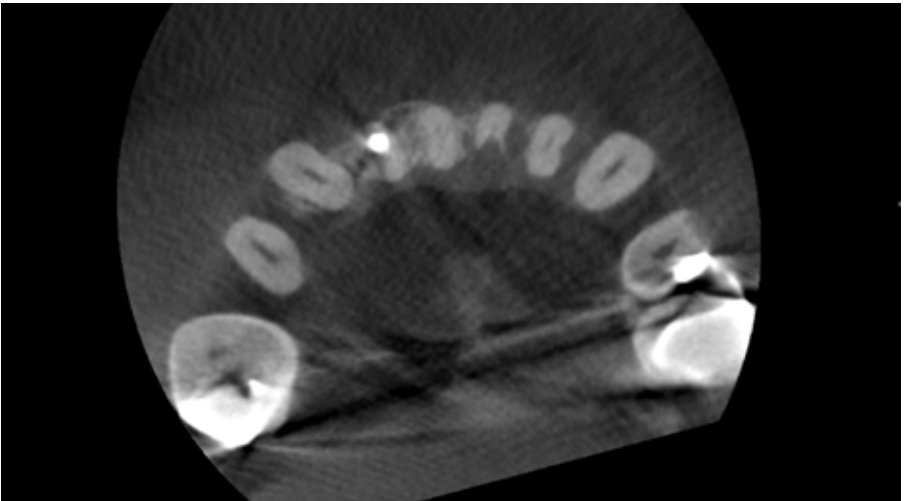
The distal aspect of tooth #10 had extensive root resorption and the tooth structure overlying the pulp is very thin. Extreme care must be exercised to avoid root perforation.

#### TREATMENT

The treatment plan for tooth #10 consisted of removing the orthodontic forces on tooth #10, initiating endodontic treatment and placing calcium hydroxide for several months (to attempt to arrest resorptive process) and completing endodontic therapy. Due to the extensive amount of root resorption, the prognosis will be guarded.

## Conventional endodontic treatment including calcium hydroxide therapy.

TOOTH #24 | AGE 51



CBCT Axial Slice



Three-Dimensional Reconstruction

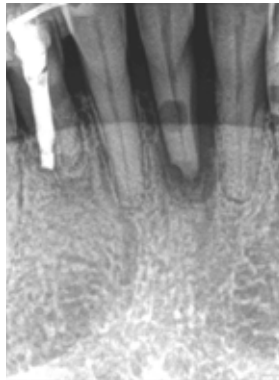


## DIAGNOSIS

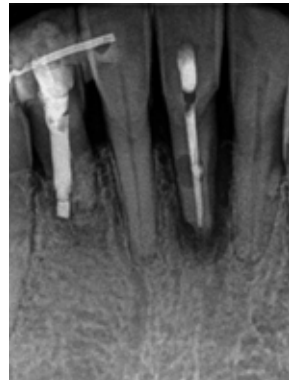
Patient presented the chief complaint of a loose lower front tooth. Clinical examination revealed a non-restored tooth #24 with class 3 mobility and tenderness to percussion and palpation. Radiographs revealed a mid-root radiolucency communicating with the apex and bone loss extending up the mesial root surface to the crestal bone. CBCT displayed external inflammatory resorption on the lingual of tooth that communicated with the pulp. These findings were consistent with a diagnosis of pulpal necrosis with symptomatic apical periodontitis and external resorption.

## CHALLENGE

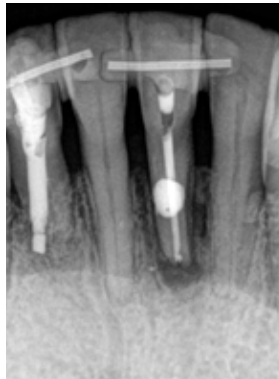
The extensive bone loss and excessive clinical mobility made the prognosis for treatment very poor. In addition, the location of the external resorptive defect (on the lingual of tooth #24) magnified the difficulty of this case.



Pre-Op X-Ray



After Endodontic Treatment



Post-Surgery



6-Month Recall

## TREATMENT

Root canal treatment was completed over two visits, medicating with calcium hydroxide. A lingual splint was placed by the patient's general dentist to stabilize the tooth. Surgical repair of the lingual resorptive defect

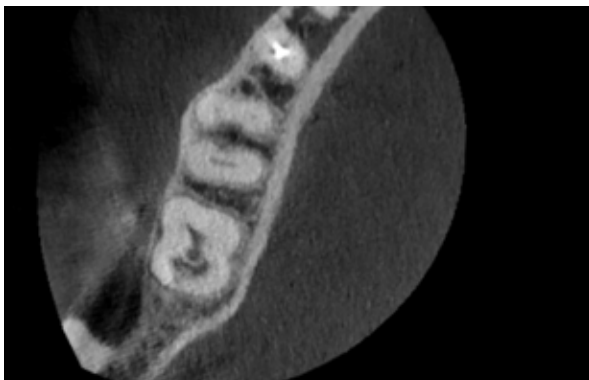
with Geristore, apical surgery with a bioceramic putty retrofilling, scaling and root planning were also performed. 6-month recall shows resolution of the radiolucency with bone fill up to the crestal bone.

## Arrested external resorption.

TOOTH #31 | AGE 69



Radiograph: 10 Years Ago

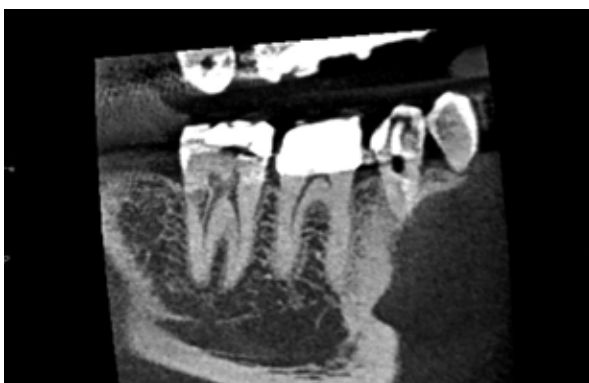


CBCT Axial Slice

### DIAGNOSIS

Patient is asymptomatic; but, aware that tooth #31 has had a resorptive defect for over ten years. There is no evidence of the defect upon visual inspection and clinical findings are within normal limits.

CBCT images display a resorptive defect on the distal aspect involving the dentin and communicating with the periodontal ligament. This defect extends into the middle third of the root; but, does not communicate with the pulp chamber or distal canal. These findings support a diagnosis of normal pulpal and periapical tissues, with an external resorptive defect.



CBCT Sagittal Slice

### CHALLENGE

It is often difficult to ascertain if the resorptive process is active or arrested. Comparing the current radiograph with those taken several years in the past can assist in this evaluation and help determine the most optimal treatment plan.

### TREATMENT

The lesion has been present and unchanged on radiographs (10+ years). Patient opted to re-evaluate in 6 months with a repeat CBCT. If the lesion increases in size, treatment options would be considered at that time.

## WHEN TO REFER

Sometimes it's difficult to know when a referral is best for your patient. Guidelines from The American Association of Endodontists (AAE) enable you to assign a level of difficulty to your case, making it easier to decide whether a referral is the best choice.

Visit **[rootcanaldocs.com/patient-referral](https://rootcanaldocs.com/patient-referral)** to download a PDF and see a complete list of considerations to properly evaluate whether a case meets minimal, moderate, or high levels of difficulty.

## READY TO REFER?

Visit us at **[rootcanaldocs.com](https://rootcanaldocs.com)** to fill out our online referral form.

**FOUR LOCATIONS, ONE GREAT EXPERIENCE.**

ANN ARBOR (734) 973-2727	BRIGHTON (810) 229-7800	LIVONIA (734) 261-7800	WEST BLOOMFIELD (248) 626-0600
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As one of the largest endodontic specialty practices in the state, we have four offices in SE Michigan to better accommodate your patients. All of our offices have hours Monday through Friday with early morning (7am) openings and evening appointments (until 7pm), and availability on Saturdays in Livonia. Patients can make an appointment at the location that's most convenient for them.

We also participate with most major dental benefit plans so your patient's experience will not only be pleasant, but hassle-free.

Visit **[rootcanaldocs.com](https://rootcanaldocs.com)** for more information about each of our locations.