

# Treating External Cervical Invasive Resorption

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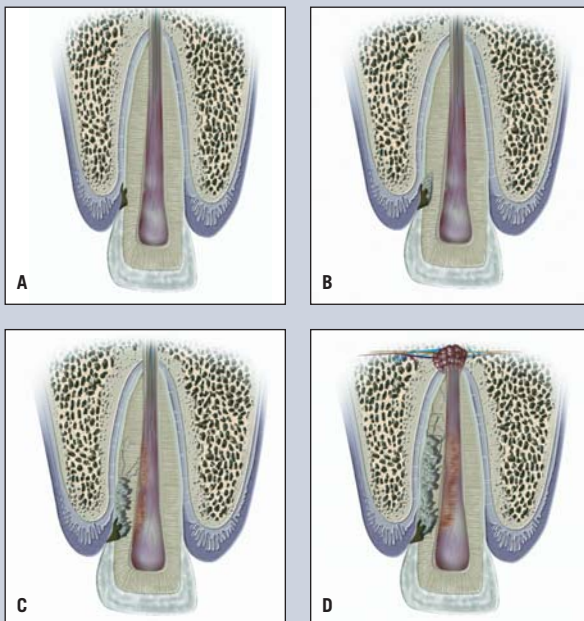
**E**xternal cervical invasive resorption (ECIR) is localized, periodontally derived, inflammatory tissue loss that begins on the root surface, at or below its epithelial attachment.<sup>1</sup> This resorption of cervical enamel and dentin is asymptomatic and often noticed unexpectedly on routine radiographs or upon clinical examination and is depicted by a pink spot in the crown overlying the highly vascular resorptive tissue. External cervical invasive resorption shares nomenclature with several terms, including extracanal invasive resorption,<sup>2</sup> subepithelial inflammatory root resorption,<sup>3</sup> cervical resorption,<sup>1</sup> and burrowing resorption.<sup>4</sup>

## CLASSIFICATION AND DESCRIPTION

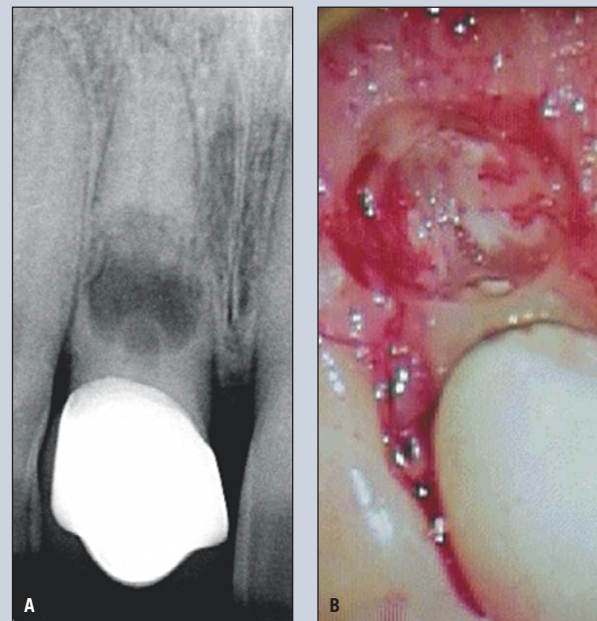
Heithersay categorized ECIR into four clinical types (Figures 1A through 1D).<sup>5</sup> Class 1 indicates a small cervical resorption with shallow dentin penetration and, usually, a soft tissue defect that bleeds upon probing. Radiographs may show a small coronal radiolucency in these instances. Class 2 injuries penetrate close to the coronal pulp chamber, they do not extend into radicular dentin. As opposed to dental caries, an irregular, variable density, radiographic lesion overlies the outline of the root canal, which may occur as a result of

the protective function of preentin.<sup>6</sup> Pulp horns appear “carved out” and the pitted root surface resembles an orange peel when viewed microscopically.<sup>7</sup> Class 3 lesions extend into the coronal third of the root as well as the coronal dentin (Figures 2A and 2B). The radiographic appearance in Class 3 lesions will often appear moth-eaten, with small, finger-like projections, and a radiopaque line separates the resorption from the root canal. Class 4 ECIR extends the invasive process beyond the coronal third of the root.

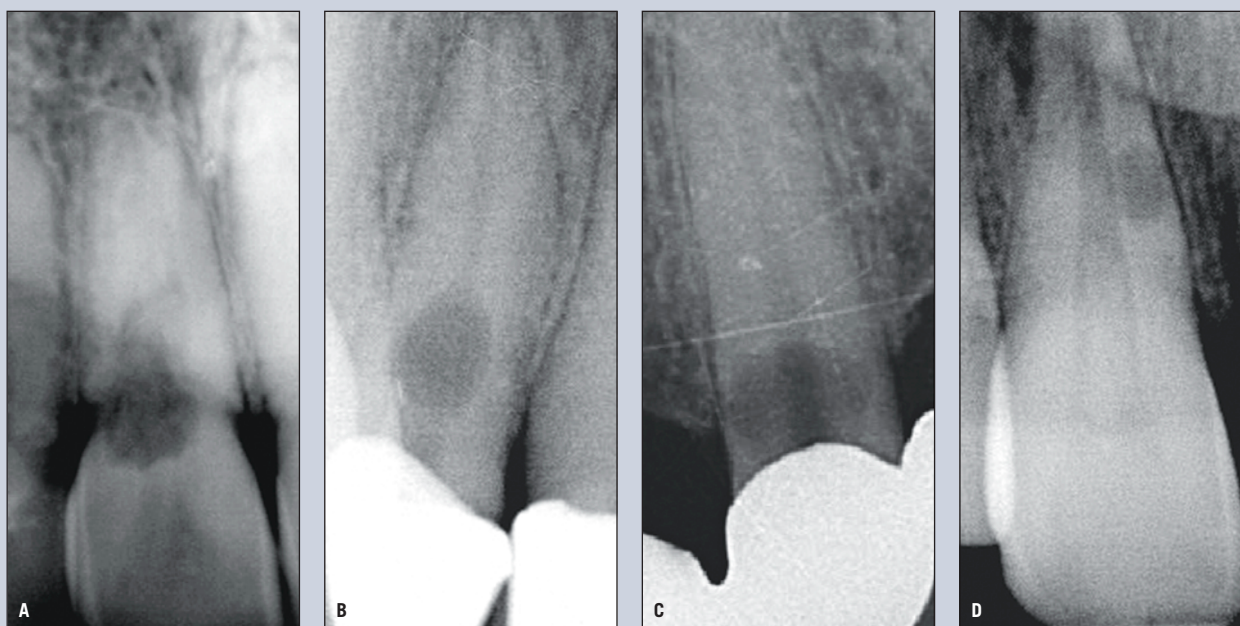
For a differential diagnosis, it is important to distinguish between



Figures 1A through 1D. Four categories of ECIR.



Figures 2A and 2B. Class 3 lesions extend into the coronal third of the root as well as the coronal dentin. Moth-eaten radiographically, often with small finger-like projections, a radiopaque line separates the resorption from the root canal.



**Figures 3A through 3D.** For a differential diagnosis, it is important to distinguish between ECIR, internal resorption, external resorption, and caries.

ECIR, internal resorption, external resorption, and caries (Figures 3A through 3D). These are summarized in Table 1.

### ETIOLOGY AND RISK FACTORS

The etiology of ECIR is debatable; however, it is theorized that the presence of natural cementum defects or a physical

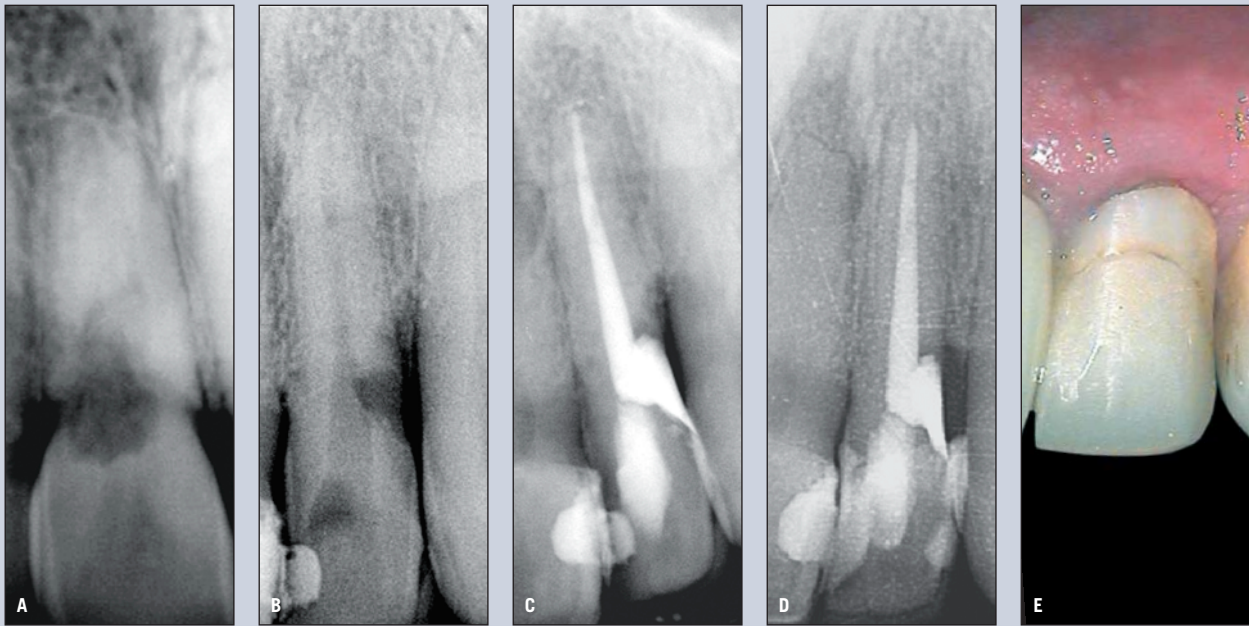
injury may predispose the root surface to invasion by sulcular microorganisms.<sup>8</sup> It is uncertain whether these organisms activate the resorptive process or are secondary invaders following a benign fibro-osseous lesion.<sup>5</sup>

From a group of 222 patients, in which 257 teeth showed signs of ECIR, Heithersay was able to identify 11 pre-

disposing factors for this condition.<sup>9</sup> These risk factors occurred alone or in combination. The predisposing factors, displayed in the order of those occurring most frequently to least frequently, were as follows: orthodontic treatment, trauma, unsuccessful restoration, unknown reasons, intracoronal bleaching, surgery, compromised periodontal

**Table. Differences between ECIR, internal resorption, root caries, and external resorption.**

	ROAD MAP	INTERNAL RESORPTION	ROOT CARIES	EXTERNAL RESORPTION
<b>PROGRESSION</b>	Outside-In	Inside-Out	Outside-In	Outside-In
<b>PULP STATUS</b>	Generally vital	Vital	Vital or Necrotic	Necrotic
<b>RADIOGRAPHIC APPEARANCE</b>	Irregular, variable density	Symmetrical, smooth margins	Symmetrical	Asymmetrical, moth-eaten
	Hypercalcified around canal	Canal outline enlarged	Canal outline visible	Canal outline visible
<b>PROBING</b>	Hard, smooth, knife-edged	Usually not probeable	Soft, decalcified	Variable



**Figures 4A through 4E.** The treatment goal of ECIR should be directed toward debriding and inactivating the resorptive tissue and restoring the defect with biologic, biomimetic, or restorative materials.

treatment, bruxism, delayed eruption, developmental defects, and interproximal stripping.

## TREATMENT AND PROGNOSIS

The clinician's objective when treating ECIR should be directed toward debriding and inactivating the resorptive tissue and restoring the defect with biologic, biomimetic, or restorative materials (Figures 4A through 4E). Surgical and nonsurgical approaches are guided by the ECIR classification and defect location.<sup>10</sup>

Heithersay treated 94 patients and 101 teeth diagnosed with ECIR and achieved complete success over a 3- to 8-year follow-up period for Class 1 resorptions.<sup>5</sup> Equal success was demonstrated with Class 2 lesions during a 3- to 12-year follow-up period. Treatment involved topical application of 90% aqueous trichloroacetic acid to devascularize the resorptive tissue by coagulation necrosis,<sup>11</sup> curettage, which was followed by endodontic therapy where

necessary, and restoration, sometimes including orthodontic extrusion. Class 3 ECIR cases had 96.8% resorption control (n = 61), a mean survival rate of 5.8 years, and presented an overall success rate of 77.8% when angular bone loss, periapical changes, and root fractures were taken into account. The survival rate of Class 4 resorptions after treatment was 50%, suggesting that no treatment or extraction may be a better choice for these teeth.

## CONCLUSION

The resorption rate in teeth with untreated ECIR has yet to be fully elucidated. Therefore, the risks of no treatment versus those of definitive therapy must be considered based on the available levels of evidence. Although jeopardizing supporting bone for a future prosthesis is a consideration, the maintenance of the natural dentition for as long as possible remains the treatment of choice for clinicians and their patients. ■

## REFERENCES

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