

# RADIO “LOGICAL” REFLECTIONS

Before it's too late...

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## PRESENTATION OF A CASE

A 45-year-old woman in overall good health consulted us for what she described as discomfort, not true pain, in the lower incisor region. She revealed a history of dental trauma caused by an automobile accident that resulted in the lower left central incisor becoming devitalized, without any symptoms, while

all other teeth remained vital. No tooth was sensitive to percussion. The periodontium, which was thick, was healthy (fig. 1 and 2). Her lower anterior teeth were moderately crowded and her sucking of the lower lip had caused development of a diaphneusia (fig. 3).



*Figure 1*  
Case 1 : frontal intraoral photo.



*Figure 2*  
Case 1 : lingual intraoral photo.



*Figure 3*  
Case 1 : habit of sucking  
and nibbling at lower  
lip had caused a diaphneusia.

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## DESCRIPTION OF RADIOGRAPHIC RECORDS

We took an orthocentric peri-apical film of the lower incisors (fig. 4), which revealed that:

- the lower left central incisor had lost some coronal substance and, to a lesser extent, so had the lower right central incisor;
- horizontal bone loss had occurred over the first third of the osseous support of the lower incisors;
- the image of the root canal filling on 31 showed normal density;
- an image of a lacuna was seen on the distal surface of the mandibular right central incisor. Its borders were irregular and superimposed on the canal itself but not reaching the mesial wall of the tooth;
- there was no notable thickening of the periodontal membrane;
- there was no image of an apical lacuna.



Figure 4  
Case 1 : orthocentric radiograph.

## WHAT DIAGNOSIS SHOULD BE MADE?

Cervical area resorptions result from an inflammatory process that could have been caused by a traumatic incident. These types of lesions are asymptomatic, continuously evolve, and are often discovered only by chance. They occur most frequently on vital teeth near the epithelial attachment, developing through mechanisms that have not yet been fully elucidated.

It is generally understood that the cementum affords a certain amount of protection against osseous resorption to underlying root dentin but it is thought that a rupture in cemental continuity, caused, for example by an

episode of micro-trauma, can expose dentinal proteins to contact with osseous cells that do not recognize them as "self" substances and reject them in an auto-immune reaction. The bone then generates an inflammatory response that originates the resorption. The inflammatory reaction is sustained by bacteria coming from the sulcus, which explains the lysis of adjacent bone.

Direct trauma, surgery affecting the cemento-enamel junction, a history of root planing and scaling, chemical treatment of root surfaces, and some tooth bleaching techniques that use elevated levels of oxidants in water

oxygenated at more than a 30% level<sup>4,5</sup> are among the different agents susceptible of creating cementum lesions. Orthodontic treatment has also been cited as a risk factor.

Recently, von Arx *et al.* have also been able to discern a correlation between the presence of multiple cervical resorptions and infection with the invasive feline herpes virus<sup>7</sup>.

It is difficult to make a diagnosis of these resorptions and almost impossible to do so without radiographs. A series of films, taken at different angles, can demonstrate the "sign of the canal" that superimposes itself over the root lesion. Patel recently proposed the use of computed cone beam tomography to discern the lesions more precisely and to follow

their development<sup>1,6</sup>. Heythersay classified them in four categories:

- class 1 : small, invasive cervical lesion causing a slight dentinal reaction;
- class 2 : an established lesion that is clearly delimited from the pulpal chamber and extends slightly along the root;
- class 3 : one third crown and root are affected;
- class 4 : more than one third of root and crown are affected.

Teeth with class 4 lesions invariably require extraction.

Some observers have noted the existence of slight color changes, with the appearance of characteristic pink spots<sup>5</sup>, which are images of the granulation tissue perceived under a dentino-enamel pellicle.

## WHAT STANCE TO ADOPT REGARDING THIS PHENOMON AND WHAT ARE ITS IMPLICATIONS FOR ORTHODONTIC TREATMENT

In accordance with the severity of the attacks, as described by Heythersay<sup>2</sup>, the location of the cervical limit



Figure 5

Case 1 : Intraoral view of flap laid back. Note the clearly defined limit of the lesion and the pink colored granulation tissue.

of the lesion, its volume, and the status of the pulp, different therapeutic approaches can be proposed. But even when treatment is undertaken, the prognosis for involved teeth remains guarded.

For problems of stage 1 and stage 2 intensity, practitioners can propose laying back flaps to uncover the full extent of the lesion, to excise granulation tissue (fig. 5), to uncover the clear limits of the lacunae, and to confirm the non-infectious nature of the resorption. They should then treat the root surface with trichloroacetic acid for 30 seconds<sup>3</sup>, and restore the tooth with glass ionomer cement modified with CVIMAR plastic, a material with low toxicity and the only one that

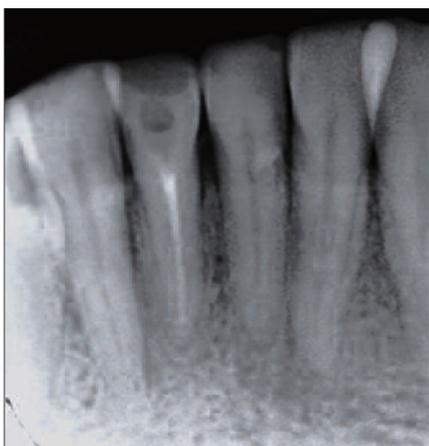


Figure 6  
Case 1 : post-operative peri-apical radiograph.

accepts *in vitro* adhesion of periodontal cells<sup>1</sup>.

The practitioner should take a check-up peri-apical film after completion of the procedure and plan to see the patient for follow-up visits after one month, then in six months, and, afterwards, once a year (fig. 6).

Some authors have suggested orthodontic extrusion of roots affected by this type of resorption to uncover the cervical limit of the lesion and to raise it above the gingiva thus making it possible for the dentist to place a restoration in a dry field, respecting biological space without resorting to an osteotomy.

This solution should be considered where the resorption of anterior teeth is buccal, especially when the patient's smile line is high. But moving these teeth is a delicate procedure and practitioners need to keep a watchful eye on their vitality. Pulp removal should not be employed routinely because cementum blocks spread of the resorption that is threatening the pulp.

For cases of Class 3 and 4 intensity, more or less prompt extraction is usually indicated with placement of an implant soon after if sufficient space is available for it (see case 2, illustrated by figures 7 to 11).



a



b

Figures 7a and 7b  
Case 2 : intraoral views of a Class 4 situation.



Figure 8  
Case 2 : peri-apical radiograph of this situation.  
Note the clear clinical signs of the attack on the  
tooth, which appears almost "decapitated."



a



b

Figures 9a and 9b

Case 3 : photos of the affected tooth that was extracted gently, with great care to preserve  
as much bone as possible.



Figure 10  
Case 2 : the implant in place.



a



b

Figures 11a and 11b  
Case 2 : check-up X-ray and intraoral photograph 4 years later.

## REFERENCES

1. Estevez R, Aranguren J, Escorial A *et al.* Invasive cervical resorption Class III in a maxillary central incisor: diagnosis and follow-up by means of cone-beam computed tomography. *J Endod* 2010;36:2012-4.
2. Heithersay GS. Clinical, radiologic, and histopathologic features of invasive cervical resorption. *Quintessence Int* 1999;30:27-37.
3. Heithersay GS. Treatment of invasive cervical resorption: an analysis of results using topical application of trichloroacetic acid, curettage, and restoration. *Quintessence Int* 1999;30:961-10.
4. JimenezRubio A, Segura JJ. The effect of the bleaching agent sodium perborate on macrophage adhesion *in vitro*: implications in external cervical root resorption. *J Endod* 1998;24:229-32.
5. Lado EA. Bleaching of endodontically treated teeth: an update on cervical resorption. *Gen Dent* 1988; 36:500-1.
6. Patel S, Horner K. The use of cone beam computed tomography in endodontics. *Int Endod J* 2009;42:755-6.
7. von Arx T, Schawalder P, Ackermann M, Bosshardt DD. Human and feline invasive cervical resorptions: the missing link? – Presentation of four cases. *J Endod* 2009;35:904-13.