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Internal granuloma with perforation – 2 case report

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ABSTRACT

Internal resorption was associated with long-term chronic inflammation of the pulp (chronic granulomatous pulpitis). When internal resorption is radiographically confirmed, endodontic treatment becomes a necessity. Vital teeth internal resorption appears radiographically as an oval enlargement of the pulp chamber and root canal with smooth, symmetrical outline. Internal granuloma is assumed to be an effect of the trauma, or pulp inflammation, the ailment is rare, asymptomatic and might progress rapidly, causing perforation.

It is difficult to remove the pulp tissue from the resorptive defect, since this area is not easily accessible for instrumentation. The delay of the endodontic treatment may lead the internal resorption to perforation, thus decreasing the chances of treatment success.

In the following paper, we present a total of two clinical cases with internal granuloma with perforation that have benefited of specific endodontic treatment.

Keywords: internal root resorption, sodium hypochlorite, warm vertical condensation technique, mineral trioxide aggregate (MTA)

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Introduction

Internal granuloma is a relatively rare form of pulp ailment, it occurs in the context of a chronic pulpitis with loss of dentine as a result of clastic cells, which can probably be initiated by a bacterial infection that is grafted on an area of necrosis of a coronal pulp fragment. It is assumed that bacterial degradation products reach vital pulp tissue, via dentinal tubules. Starting from chronic granulomatous pulpitis, it leads to centrifugal propagated resorption of the surrounding dentine. Sometimes it can perforate, opening outwards, exposing the tooth to fracture.

According to Tronstad, the presence of necrotic tissue in the coronal pulp is compulsory for internal resorption to become progressive [1]. In most cases it is painless and tends to be diagnosed during routine radiological examination. Internal resorption can occur in all teeth, may it be an unimpaired tooth, or one presenting a coronal restoration. The resorptive defect can be located anywhere in the endodontic system; when it occurs in the pulp chamber, it might be observed as a “pink stain”, while the increased pulp volume looms through the transparency of the coronal enamel.

Clinically, in internal granuloma the symptoms are relatively poor. Radiologically, it may be noticed

in the form of a radiotransparency areas, which deforms the pulp cavity or root canal contour at a given segment, with uniform appearance, smooth and symmetrical.

The aim of the root canal treatment is to stop the resorptive process, by removing granulation tissue and blood supply of clastic cells; nevertheless, if perforation exists and destruction becomes very advanced, extraction is recommended.

In the internal granuloma, root resorption internal layout is designed by multinucleated giant cells, adjacent to granulation tissue, in pulp. There are various theories supporting this assumption; the fact is that granulation tissue is involved in internal granuloma. Internal resorption occurs if the odontoblastic and dentin layer are altered or destroyed by injury (trauma).

Accompanying pain may occur with perforated internal resorption.

Differential diagnosis is sometimes difficult to assume. Radiographs in different eccentric exposures and cone beam computed tomography (CBCT) evaluations could emphasize more clearly the aspect. An internal lesion occurs in close proximity to the canal, regardless of the angulation of the X-ray beam. On the other hand, a defect on the external side of the root moves towards the canal, with the change angulation. In internal resorption, the contour of the canal and the canal is distorted and the radiotransparency resorptive defect occur in a continuous manner. External inflammatory resorption is accompanied by bone resorption, thus radiotransparencies become limited to the root and to the adjacent bone. Rarely, when internal defect perforates the root and adjacent bone is resorbed and it appears radiotransparent on radiography. In the case of external root resorption the pulp is devital, and thus the granulation tissue producing the “pink stain” is absent. For cervical root resorption and internal one, the granulation tissue is present, and can be regarded as a possible element of differentiation [2,3].

Case 1

Patient U.D. was referred for endodontic treatment on teeth 11, 12. On this occasion was diagnosed with internal granuloma on tooth 11, located in the middle segment of the root canal (Figure no. 1). A chemomechanical treatment was followed by root canal obturation through warm vertical condensation technique (Figure no. 2). On the distal eccentric x-ray exposure performed after root canal obturation, an internal resorption with lateral perforation was diagnosed (Figure no. 3). The tooth continued to be asymptomatic, but require regular radiographs control.



Figure no. 1



Figure no. 2



Figure no. 3

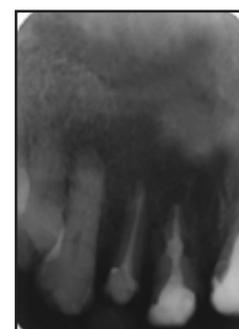


Figure no. 4

Figure no. 1. Tooth 11 internal granuloma localised in the middle segment of root canal

Figure no. 2. Appearance of root canal after resorptive defect (warm vertical condensation technique)

Figure no. 3. Mesial eccentric x- ray position highlights internal resorption with perforation on the lateral side

Figure no. 4. On the six years follow up rx, the separation of the apical and middle segments of the root is observed

Thereafter, on a next meeting evaluation, 6 years after the establishment of the endodontic treatment, the patient presents with 1.1 symptomatic tooth and with mobility of 3rd grade, with a fistula located in the upper vestibule; in between the roots of the two incisors, on the X-Ray check there is acknowledged a separation appearance of the root segments (Figure no. 4.) the bilateral aspect of root resorption, a "clipped" one, located in the right area of the maximum bulge of the internal resorptive process.

Case 2

For this patient V.P. aged 52 years, a cone beam computed tomography (CBCT) assessment for the upper tooth (Figure no. 5), tooth 3.5 presented internal granuloma, located at the junction of the coronary segment with the middle radicular one. The contour defect is apparently small, thus deciding endodontic therapeutic approach. (Figure no.6).

Upon evaluation after three years, the patient presents with 3.5 symptomatic tooth, with mobility grade 2 to 3. A CBCT scan (Figure no. 7) finds internal granuloma with perforation and sealer discharge throughout the fault and separation of coronary and middle radicular fragments.

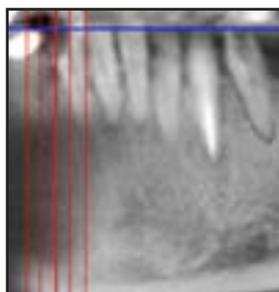


Figure no. 5. Internal granuloma



Figure no. 6. X-Ray assessment after warm vertical condensation technique

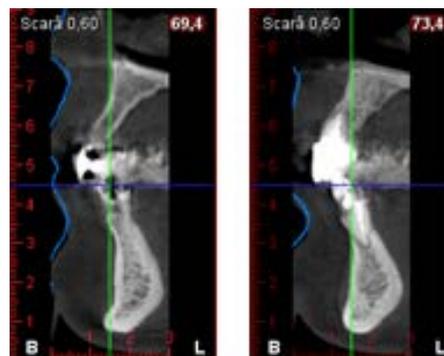


Figure no.7. A CBCT scan emphasizes internal root resorption perforation

Regarding the two clinical cases of perforated internal root resorption analyzed, it should be mentioned that the correct diagnosis is made based on the retroalveolar radiography of eccentric exposure, for the first case and on the second patient the diagnosis accuracy is obtained based on the CBCT evaluation.

Using warm vertical condensation obturation technique and mineral trioxide aggregate (MTA) represents an additional guarantee regarding the outcome of the conservative treatment.

Discussions

The appearance of internal resorption with perforation is not always predictable.

The stimulation factor for internal granuloma is infection. It is usually asymptomatic and might be

diagnosed by routine radiographs.

However, early stages of internal resorption are not detectable on conventional radiography [4,5].

On perforated internal root resorption where internal resorption progressed towards the periodontal tissue, resulting in periodontal lesion, additional problems arise, such as periodontal inflammation, bleeding, difficulty in filling the canal and development of the sinus tract. Early diagnosis of internal granuloma is difficult by conventional X-ray, CBCT scan can detect resorption in early stage, with details regarding size, shape, location and presence of perforations. This perforation cannot always be determined radiographically (through conventional radiography), as long as it is adjacent to the resorptive fault [6, 7].

The removal of the pulp tissue from the resorptive defect is difficult, since this area is not easily accessible for instrumentation.

Working length determination with apex locator is not possible in case of perforation.

The use of calcium hydroxide helps disinfect and control bleeding in the root canal.

Combined gutta-percha (thermoplastic techniques) for root canal and MTA filling for perforation area or Biodentine is the treatment of choice.

However, due to delays in endodontic treatment establishment, internal resorption may perforate, thus reducing the chances of treatment success [8]. Initially, it is recommended using abundant irrigation with sodium hypochlorite to dissolve and dislodge pulp fragments from inaccessible areas of resorptive defect. Sodium hypochlorite is a powerful antimicrobial agent, a good solvent of necrotic tissue and a very effective endodontic irrigant for removing pulp tissue [9]. In the same time is recommended to use ultrasonic instrumentation coupled with abundant irrigation.

The prognosis of the perforated resorption is debatable, depending on the degree of sealing of the resorptive defect. As an alternative, the canal and the area resorbed can be obturated using mineral trioxide aggregate. Applying mineral trioxide aggregate (MTA) in the resorption area is justified and represents an optimal therapeutic alternative due to its exceptional qualities.

The prognosis is good once the inflamed tissue was removed. The smaller the perforation size is the prognosis is more predictable.

The accompanying pain may occur with perforated internal resorption.

Surgical approach might be performed in a second intention which allows direct access to the perforated area of the root.

Conclusion

The diagnosis of internal granuloma with perforation is often difficult, conventional radiography is often inadequate so because of the bidimensional radiography limit, it does not always allow early diagnosis.

Thus, the contribution of the 3D imaging (CBCT) is salutary for diagnostic accuracy.

In terms of using alternative materials such as MTA in combination with thermoplastic gutta-percha, medium-term prognosis of conservative treatment, even while internal resorption with perforation, can thus be satisfied.

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