

NON-SURGICAL HEALING AFTER CONVENTIONAL ENDODONTICS TREATMENT: A CASE SERIES

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Abstract

Most periapical diseases are caused by bacteria, and the best way to treat them is to eliminate the cause. This can be done by appropriate cleaning and shaping and filling the root canal with a material that will prevent bacteria from re-entering which is important for the long-term success of endodontic treatment. In this case series, the patient had large periapical lesions, but they were able to be successfully treated with non-surgical root canal treatment. This shows that periapical lesions can respond favourably to non-surgical treatment, and it is not always necessary to do surgical treatment.

Keywords: endodontic treatment, non-surgical healing, periapical lesion, calcium hydroxide

Introduction

Periapical lesions are initiated by an inflammatory response at the root apex of teeth with non-vital pulps. Bacterial infection may lead to periapical lesions. Periapical radiolucent areas are generally diagnosed during a routine dental radiographic examination or after acute toothache. Most periradicular lesions (>90%) can be classified as dental granulomas, radicular cysts, or abscesses.¹ The formation of periapical lesions is not fully understood, though it is accepted that pulp necrosis produces an ideal environment for the growth of microorganisms which in turn release toxins into the periapical tissues, inducing an inflammatory reaction and thus the immunopathological formation of periapical lesion. Genetic susceptibility may also play a role in the development of periapical lesions.

The ultimate goal of endodontic therapy should be to return the involved teeth to a state of health and function without surgical intervention.² Advancements in scientific knowledge on the genesis, pathologic nature, and clinical behaviour of periapical lesions and their successful treatment in various clinical trials have started favouring a non-surgical approach. It has been observed in this case that periapical lesions have the potential for healing without surgical intervention.

The treatment of periapical lesions, in most cases is non-surgical root canal treatment. However, in some cases, surgical treatment may be necessary.³ This may involve removing the apex of the tooth or creating a flap in the gum to drain the lesion.

Case report

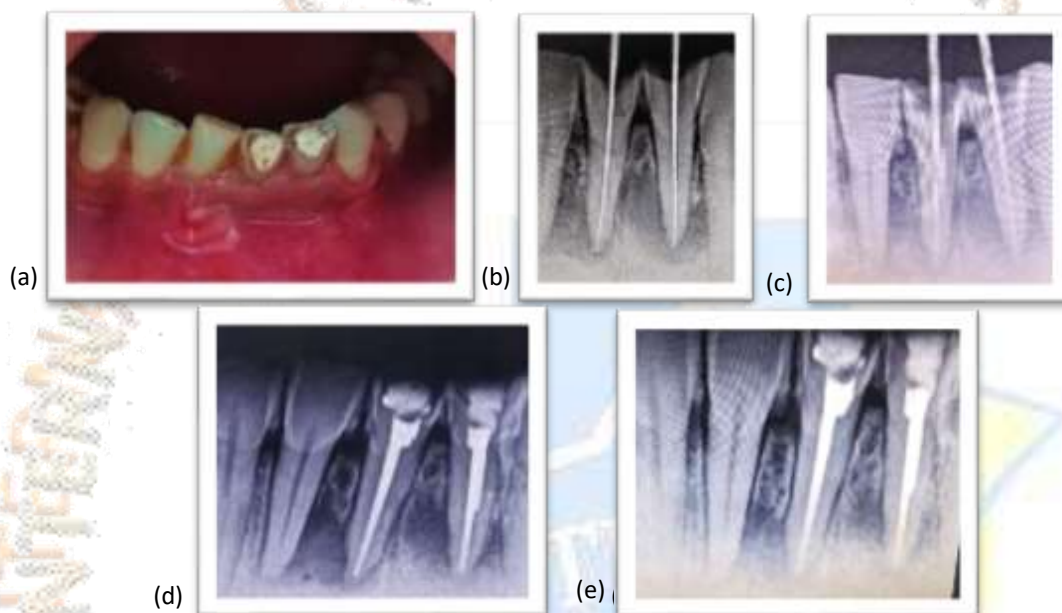


Fig 1: (a) pre-operative photograph showing sinus opening
 (b) & (c) working length and master cone radiograph
 (d) & (e) 6-month and 1-year follow-up radiograph

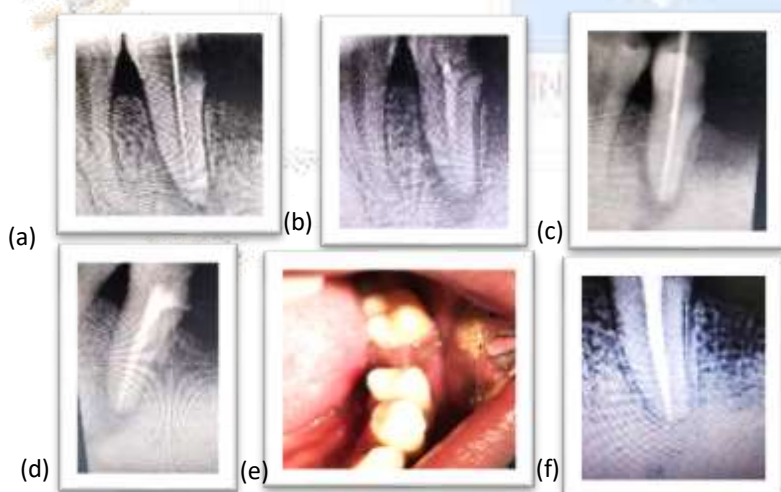


Fig 2: (a) working length radiograph
 (b) calcium dressing given as intracanal medicament
 (c) & (d) master cone and post-obturation radiograph
 (e) post-obturation photograph
 (f) 1-year follow-up radiograph

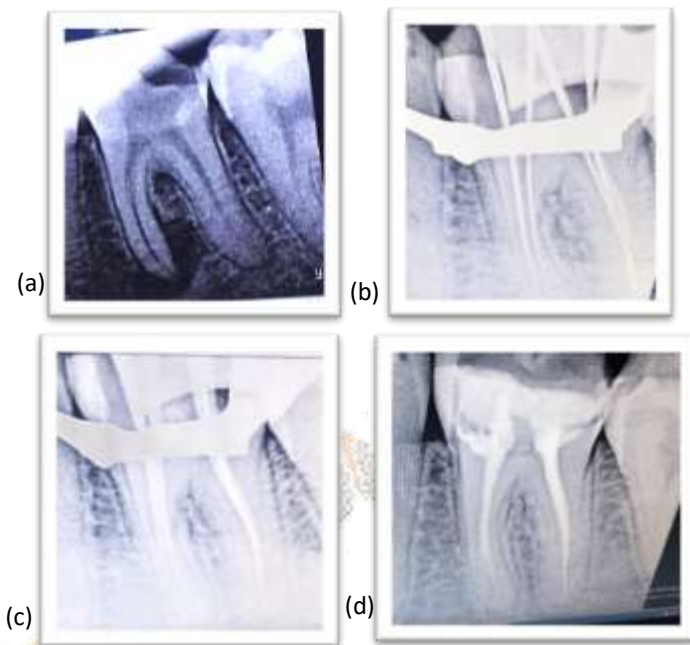


Fig 3: (a) pre-operative radiograph
(b) & (c) working length and master cone radiograph
(d) 1-year follow-up radiograph

Discussion

The first choice of treatment is to remove the microbial infection. This can be done through a combination of mechanical instrumentation and chemical disinfection. Once the infection has been eliminated, the periapical tissues can begin to heal.

¹ **Bender and Seltzer** both reported that exceeding the apical zone with penetration into the radio-transparent area could contribute to healing by establishing drainage and affording pressure relief. This is because the periapical tissues may be under pressure due to the accumulation of fluid and debris. By exceeding the apical zone, the dentist can create a pathway for this fluid to drain, which can help to relieve the pressure and promote healing. It is important to note that exceeding the apical zone is not always necessary for healing to occur. Overall, the treatment of periapical lesions should be individualized to the patient's specific needs.

The mechanism of action of calcium hydroxide can help to promote the healing of periapical lesions. These effects include: ¹

- 1) **Anti-inflammatory activity** due to its ability to chelate metal ions, which can help to stabilize mast cells and inhibit the release of inflammatory mediators.
- 2) **High pH**, to neutralize acidic products produced by bacteria to create an environment less favourable for bacterial growth.
- 3) **Activation of alkaline phosphatase**
- 4) **Anti-bacterial action**

In addition to these effects, $\text{Ca}(\text{OH})_2$ is also thought to have some other properties, it is thought to be able to stimulate the growth of new blood vessels, which can help to improve the blood supply to the periapical tissues. Overall, $\text{Ca}(\text{OH})_2$ is not as effective as some other intra-canal

medicaments, but it is a safe and effective option for many patients. There is some evidence to suggest that $\text{Ca}(\text{OH})_2$ may be more effective in promoting the healing of periapical lesions in young patients. This is likely due to the fact that young patients have a better blood supply to the periapical tissues, which can help to deliver the $\text{Ca}(\text{OH})_2$ to the affected area and promote healing. Periapical lesions are inflammatory lesions that occur at the apex of root often caused by infection of pulp. Pulp necrosis occurs due to trauma or caries is the common cause.⁴ The passage concludes by stating that the host reacts to the invasion of microbes, which causes the development of different lesions. The body's immune system tries to fight off the infection, but this can sometimes lead to formation of periapical lesions. The bone around the tooth root is resorbed, and a granuloma or abscess may form.² These lesions can be seen on radiographs as radiolucency.

Conclusion

In this case report non-surgical endodontic treatment proved successful in promoting the healing of periapical lesions. Irrespective of the size of the lesion every attempt should be made to treat the periapical lesions with non-surgically. The prognosis for periapical lesions is generally good. With proper treatment, most lesions will heal completely. However, it is important to follow up with your dentist regularly to monitor the healing process. Patient consent was obtained prior to treatment.

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