

Content available at: <https://www.ipinnovative.com/open-access-journals>

IP Indian Journal of Conservative and Endodontics

Journal homepage: <https://www.ijce.in/>

Case Report

Healing of periapical lesion by non-surgical endodontic therapy: A case series

Athira Ramesh^{1*}, Rajesh Pillai¹, Afzal A¹, Anakha Santhosh¹, Arunima G.S¹, Sandeep K. V¹

¹Dept. of Conservative Dentistry and Endodontics, PMS College of Dental Science and Research, Trivandrum, Kerala, India



ARTICLE INFO

Article history:

Received 13-04-2024

Accepted 16-05-2024

Available online 03-06-2024

Keywords:

Periapical lesion

Non-surgical endodontic therapy

ABSTRACT

Trauma to the anterior teeth can lead to pulp necrosis and subsequent periapical lesions. Most of the cases remain undetected unless found in an IOPAR, the tooth gets discoloured or gets secondarily infected. In such cases, non-surgical endodontic therapy can be done as the first line of management with regular follow up. Surgical approach is indicated only if the non-surgical approach becomes a failure. A series of two cases with large periapical lesion following trauma to the maxillary anteriors were treated with multivisit non-surgical endodontic therapy. Inter-appointment dressings were given. Patients were recalled for evaluation of healing. Six months follow up radiographs showed healing of the lesion with significant increase in the radiopacity suggestive of bony healing. For the treatment of periapical lesions, non-surgical endodontic therapy should be considered as first line treatment option as it proves to be a more conservative approach.

This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Trauma, caries, or tooth wear can lead to inflammation of pulp and can result in pulp necrosis, if left untreated.¹ Microbial invasion of this necrotic pulp and their propagation into the periapical area leads to periapical pathosis. In this stage, neither host defense nor systemic antibiotic therapy would be effective in restricting the infection due to the absence of local blood supply.² Then, non-surgical endodontic therapy is considered as the first line of management. Periapical or peri-radicular lesions acts as a barrier to prevent the spread of microorganisms into the surrounding tissues.^{3,4} Here, the bone is resorbed and substituted by a granuloma made of polymorphonuclear leukocytes (PMN), other inflammatory cells, fibres and new blood vessels. These lesions are identified as a periapical radiolucency on a radiograph.⁵ Majority of them can be

managed by non-surgical endodontic therapy⁶ and healing becomes evident in 6 to 12 months post operatively. Upto 88% healing has been noted within this time period. But it takes about 4 years for the complete healing of the lesion. Majority of the periradicular lesions can be either a dental granuloma, a periradicular cysts, or an abscess. Definitive diagnosis is possible only with histopathological analysis.⁷

The possibility of a periapical radiolucent lesion to be a periradicular cyst is much higher if the following conditions are present:

1. The lesion is involving one or more non vital teeth.
2. The lesion is $\geq 200 \text{ mm}^2$
3. On aspiration, a straw-colored fluid is obtained or drainage of such fluid through an access.
4. The presence of cholesterol crystals in the aspirated fluid.

100% of the cases with radiographic lesion sizes of $\geq 200 \text{ mm}^2$ ⁸ and 60–67% of lesions measuring 10–20 mm

* Corresponding author.

E-mail address: athiramesh1992.a@gmail.com (A. Ramesh).

in diameter were reported to be cysts.⁹ The treatment approaches for periapical lesions include non-surgical root canal treatment, periapical surgery, or tooth extraction. If non-surgical treatment fails, periapical surgery is the treatment of choice.

A true cyst with a distinct epithelial lining and no communication with the root canal is more difficult to manage by non-surgical approach and usually requires surgical intervention. But a pocket cyst, having communication with the root apex, responds pretty well with orthograde endodontic therapy.⁷

2. Case 1

A 35 year old male patient came to the department with chief complaint of numbness in relation to right upper corner tooth for 2 months. He had a history of trauma 5 years back, followed by root canal treatment of two upper front teeth.

Clinically, the right maxillary canine was intact with a draining sinus on the alveolar mucosa and mild tenderness on percussion. The vitality test was negative. Radiographically, a well circumscribed radiolucency was noted in relation to the apical region of 12 and 13. 11 and 12 were root canal treated with adequate obturation and the root apex of 13 showed around 0.5mm resorption. The clinical diagnosis was an infected periapical cyst. Non-surgical endodontic management was the treatment plan.

Under rubberdam isolation, access cavity was prepared. The working length was determined to be 29mm. Cleaning and shaping was done using stainless steel endodontic hand files and the apex was enlarged to #50k. Stepback was done upto #80k. The canals were intermittently irrigated with 3% sodium hypochlorite and normal saline. After final rinse with normal saline, the canal was dried using paper point, calcium hydroxide intracanal medicament was placed and temporary restoration was given. The patient was recalled after 7 days. Pus discharge was noted from the sinus opening. Temporary restoration was removed and the canal was instrumented using #50 k file and thoroughly irrigated with 5ml of 3% sodium hypochlorite. This was assisted with ultrasonic activation of the irrigant for 60 seconds, by placing the tip 2mm short of the working length. Final flushing was done with normal saline and the canal dried with paper point. Triple antibiotic paste intracanal dressing and temporary restoration was given. The third appointment was scheduled after 7 days. The sinus tract showed complete healing. The access cavity was reopened and the previous intracanal medicament was removed. A new closed dressing with metapex was given. After one week, the patient was recalled and the canal was obturated by cold lateral compaction technique using 50 size master cone and AH Plus sealer. Post endodontic restoration was done with composite. Six months follow up shows reduction in the size of periapical radiolucency with new

bone formation. Figure 1

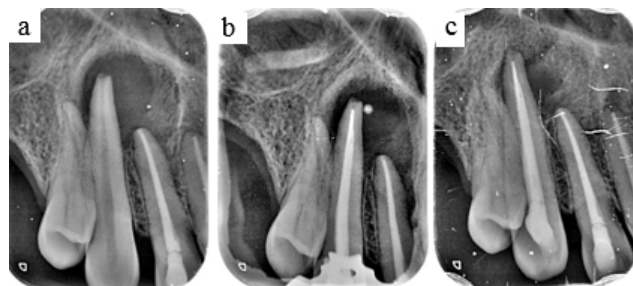


Figure 1: a: Preoperative; b: Postoperative; c: and 6 months follow up radiographs

3. Case 2

A 22year old female patient reported to the department with a chief complaint of discoloured upper front tooth since 4 months. The patient gives a history of trauma occurred 3 years back and initiation of RCT in another clinic 6months ago.

Intra oral examination showed discoloured 11 with temporary restoration on the palatal surface. The tooth had mild tenderness on percussion. Radiographic examination revealed prepared access cavity on 11 with an enlarged root canal. A well circumscribed periapical radiolucency involving the apical third of 11 and 12 was noted. The treatment plan was non-surgical endodontic therapy of 11 and 12.

Under local anaesthesia and rubber dam isolation, access cavity was prepared on 12. The temporary restoration was removed from 11. Working length was determined - 22mm and 23mm for 11 and 12, respectively. Cleaning and shaping was done upto # 80 H file on 11 and F3 rotary file (ProTaper gold) on 12, with intermittent irrigation using 3% sodium hypochlorite solution. After final rinsing with normal saline, the canals were dried with paper point and packed with calcium hydroxide. The patient was recalled after one week. The previous intracanal medicament was removed. The canals were flooded with 3% sodium hypochlorite and ultrasonically activated for 60 seconds. Final rinsing with normal saline was done. The dried canals were packed with triple antibiotic paste and temporary restoration was given. In the third appointment, which was scheduled after one week, the intracanal dressing was replaced with metapex. After one week, the patient was recalled. The root canals were filled with normal saline and ultrasonically activated to ensure complete removal of the remnants of metapex. Then, obturation was done using #80 and F3 guttapercha points for 11 and 12, respectively. In 11, since the canal was wider, ultrasonic condensation of gutta percha was done to get a three dimensional obturation. Post endodontic restoration was done with composite. Follow up radiograph taken after 6 months shows reduction in periapical radiolucency

suggesting healing of the lesion. Figure 2

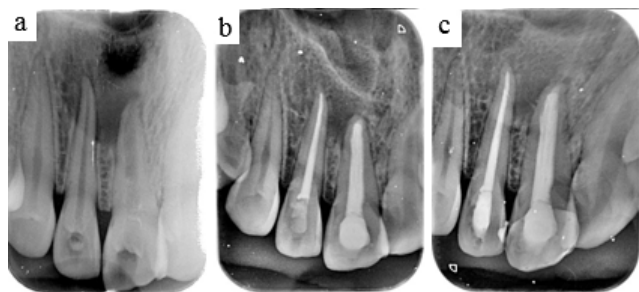


Figure 2: a: Preoperative; b: postoperative; c: and 6 months follow up radiographs

4. Discussion

Cleaning and shaping of the root canal and microbial eradication are the key factors for the success of non-surgical endodontic therapy. In these cases, aseptic conditions were maintained by using rubberdam isolation and sterile instruments. Intermittent flushing with 3% sodium hypochlorite and sterile normal saline facilitated the removal of debris. Recapitulation was done using #10 k file in between each instrument. These protocols helped in preventing the clogging of the apical region, thereby maintaining the patency of the root canal.

The canals were flooded with 3% sodium hypochlorite and activated using ultrasonics for 60 sec, keeping the tip 2mm short of the working length at each appointment to ensure elimination of any residual microorganisms and remnants of intracanal medicament. Ultrasonic vibration generates a continuous movement and increases the effectiveness of the irrigants in cleaning the root canal space.¹⁰ Final flushing was done with sterile saline in each appointment. This was followed by a fresh dressing with the medicament.

The patients were recalled on a weekly basis to change the medicament. Calcium hydroxide was the intracanal medicament in the first appointment. This was followed by triple antibiotic paste (TAP), because the symptoms did not subside. In the third visit, this was changed to metapex. Access cavity was temporised using Cavit G in between each appointment. TAP seems to be a successful combination of drugs in root canal disinfection/sterilization and pulp regeneration and revascularization protocol.¹¹ Regular change of metapex as intracanal dressing and root canal therapy has proven to be very beneficial in complete healing of the periapical lesion.¹² Ultrasonic condensation of gutta percha was done for getting a tightly compacted 3 D condensation. Studies done with dye penetration tests reported that ultrasonically condensed gutta-percha mass was more homogeneous with less voids and resulted in a better obturation.^{13,14} AH Plus sealer was used during

obturation.

5. Conclusion

By the combined effect of proper instrumentation, irrigation, their activation, intracanal medicaments and obturation, a periapical lesion can be conservatively managed by non-surgical endodontic therapy. But in some cases, the lesion fails to subside where surgical approach should be considered as the second line of management.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

- Zaleckiene V, Peculiene V, Brukiene V, Drukteinis S. Traumatic dental injuries: etiology, prevalence and possible outcomes. *Stomatologija*. 2014;16(1):7–14.
- Segura-Egea JJ, Gould K, Şen BH, Jonasson P, Cotti E, Mazzoni A, et al. Antibiotics in Endodontics: a review. *Int Endod J*. 2017;50(12):1169–84.
- Takehashi S, Stanley HR, Fitzgerald RJ. The effects of surgical exposures of dental pulps in germ-free and conventional laboratory rats. *Oral Surg Oral Med Oral Pathol*. 1965;20(3):340–9.
- Möller AJ, Fabricius L, Dahlén G, Ohman AE, Heyden G. Influence on periapical tissues of indigenous oral bacteria and necrotic pulp tissue in monkeys. *Scand J Dent Res*. 1981;89(6):475–84.
- Nair PR, N P. Light and electron microscopic studies of root canal flora and periapical lesions. *J Endod*. 1987;13(1):29–39.
- Orstavik D. Time-course and risk analyses of the development and healing of chronic apical periodontitis in man. *Int Endod J*. 1996;29(3):150–5.
- Calışkan MK. Prognosis of large cyst-like periapical lesions following nonsurgical root canal treatment: a clinical review. *Int Endod J*. 2004;37(6):408–16.
- Natkin E, Oswald RJ, Carnes LI. The relationship of lesion size to diagnosis, incidence, and treatment of periapical cysts and granulomas. *Oral Surg Oral Med Oral Pathol*. 1984;57(1):82–94.
- Lalonde ER. A new rationale for the management of periapical granulomas and cysts: an evaluation of histopathological and radiographic findings. *J Am Dent Assoc*. 1970;80(5):1056–9.
- Plotino G, Pameijer CH, Grande NM, Somma F. Ultrasonics in endodontics: a review of the literature. *J Endod*. 2007;33(2):81–95.
- Parhizkar A, Nojehdehian H, Asgary S. Triple antibiotic paste: momentous roles and applications in endodontics: a review. *Restor Dent Endod*. 2018;43(3):e28. doi:10.5395/rde.2018.43.e28.
- Ayodhi S, Leburu A, Krishnamurthy M, Kumar N. Non-surgical management of a large periapical cyst like lesion using metapex, a three year followup - A case report. *IP Indian J Conserv Endod*. 2023;7(4):186–9.
- Baumgardner K, Krell KV. Ultrasonic condensation of gutta-percha: An in vitro dye penetration and scanning electron microscopic study. *J Endod*. 1990;16(6):253–9.
- Bailey G, Cunningham SA, Ng YL, Gulabivala K, Setchell DJ. Ultrasonic condensation of gutta-percha: The effect of power setting and activation time on temperature rise at the root surface - An in vitro study. *Int Endod J*. 2004;37(7):447–54.

Author biography

Athira Ramesh, Post Graduate Student

Rajesh Pillai, Hod, Principal

Afzal A, Professor

Anakha Santhosh, Post Graduate Student

Arunima G.S, Post Graduate Student

Sandeep K. V, Post Graduate Student

Cite this article: Ramesh A, Pillai R, Afzal A, Santhosh A, Arunima G.S, Sandeep K. V. Healing of periapical lesion by non-surgical endodontic therapy: A case series. *IP Indian J Conserv Endod* 2024;9(2):99-102.