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## **OUTCOME OF ENDODONTIC SURGICAL MANAGEMENT IN FAILED NON -SURGICAL ENDODONTIC TREATMENT**

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### **Abstract**

The primary objective of the endodontic treatment is to produce an ideal condition for healing of periapical area. Most of the cases requiring endodontic treatment are successfully treated with a nonsurgical endodontic treatment as it has been shown to be an ideal and highly predictable treatment, but in some cases where there is persistent peri-radicular pathosis an endodontic surgery may be indicated for teeth which did not respond to a non-surgical treatment.

This paper presents 2 Case reports of failed non-surgical root canal treatment which were successfully managed with an endodontic surgery.

**Keywords:** Endodontic surgery, non-surgical endodontic treatment, Periapical lesion

## Introduction

Traditional a tooth with periapical lesion is best managed with a non-surgical endodontic treatment because its success rate has been shown to be very high. The goal of endodontic therapy is to clean the entire root canal system of microorganisms and to produce a strong apical barrier for prevention of recontamination<sup>1,2</sup>. Failure in a non-surgical endodontic treatment may be because of presence of residual bacteria (persistent infection) or due to a reinfection in a previously disinfected canal (secondary infection).<sup>3</sup>

Colonization of bacteria in the dentinal tubules of root canal usually in apical third are the main reason for persistent infections resulting in failure of root canal<sup>4,5</sup>. A proper instrumentation with canal shaping and enlargement and use of disinfection could ideally clean such areas. However, even after root canal were properly managed, bacteria have been found to be still present in root canal system mostly in apical areas leading to failure in non-surgical treatments<sup>6,7</sup>.

Retreatment should be the first alternative approach for teeth that have undergone a convention non-surgical endodontic treatment with a persistent periapical lesion. During a non-surgical endodontic treatment, a mishap may produce negative impact on outcomes by promoting the development of infections in inaccessible apical locations.<sup>8</sup>

In cases where a non-surgical endodontic retreatment is insufficient for survival of a tooth an endodontic surgery is an effective alternative for achieving a successful prognosis of such teeth<sup>9</sup>

Traditional surgery has a success rate varying from 40% to 90%. Advancement in endodontic surgical instruments and materials has led to an increase of 96.8% in success rate. According to Zuolo et al. (2000) the postsurgical outcome is 97% for the anterior teeth and 85% for the posterior teeth due to complex radicular anatomy<sup>10</sup>.

This aim of this paper is to present two case reports in which a failed non-surgical endodontic treatment in maxillary anterior teeth with periapical pathology was successfully managed by Endodontic surgical procedure

## **Case 1**

A 29 years old female patient came to our Clinic with chief complain of pain in upper anterior region. Patient gave a history of non -surgical root canal treatment done in upper right anterior teeth 2 years ago. Upon clinical examination tooth #12 was tender to percussion and palpation. Radiographic examination showed a standard root canal treatment in tooth #11 and 12 with periapical radiolucency filled with radio opaque material in relation to # 12.

Diagnosis of previously treated with symptomatic apical periodontitis was made based on the clinical and radiographic findings. A treatment plan of surgical approach with retrograde filling was advised to the patient. After patients' approval hematological investigations were carried out and the Written signed written consent was taken prior to the surgical intervention. Following local Anesthesia administration a full thickness mucoperiosteal flap was raised. A large osseous defect was observed which was refined under magnification using slow-speed bone cutting bur no 703 and water coolant. Granulation tissue along with radiopaque material was curetted from the defect. A 3 mm root resection with a surgical carbide fissure bur at a shallow angle was done. After achieving hemostasis retrograde preparation of 3mm depth were made using ultrasonic retro tips. The retro cavities were then filled with bio-ceramic putty material (Angelus BIO-C® REPAIR) using retro plugger. A radiograph was then taken to ensure the filling in its place. A thorough irrigation of bony cavity was done. The flap was repositioned and sutured. Post operative instruction along with antibiotic, and analgesic for 5 days were prescribed. The patient was recalled after 7days for follow up and removing the sutures. The patient was completely asymptomatic. A post operative radiograph was taken (Fig 1B). The patient was then recalled for follow up after 3-month, 6 months till 1 year. A radiograph was taken after 1 year which showed healing of periapical lesion (Fig 1C)



Fig 1A



Fig 1 B



Fig 1 C

## Case 2

A 32-year-old man presented to our clinic with chief complaint of pain in upper anterior teeth and a history of root canal treatment one year ago. Upon clinical examination tooth #12 was tender to percussion and palpation. Radiographic examination showed a standard root canal treatment in tooth #12 with periapical radiolucency. The tooth was restored with well fitted crown. Diagnosis of previously treated with symptomatic apical periodontitis was made based on the clinical and radiographic findings.

Two treatment options were given to patient, removal of post core and crown followed by non-surgical retreatment or surgical endodontic treatment. The patient opted for surgical approach.

Surgical approach with retrograde filling was the treatment plan recommended to the patient. After patients' approval hematological investigations were carried out and the written signed consent was taken prior to the surgical intervention. Following local Anesthesia administration a full thickness mucoperiosteal flap was raised. An osseous defect was observed which was refined under magnification using slow-speed bone cutting bur no 703 and water coolant. Granulation tissue along with radiopaque material was curetted from the defect. A 3mm root end resection with a surgical carbide fissure bur at a shallow angle was done. After achieving hemostasis retrograde preparation of 3mm depth were made using ultrasonic retro tips. The retro cavities were then filled with bio-ceramic putty material using retro plugger. A radiograph was then taken to ensure the

filling in its place. A thorough irrigation of bony cavity was done. The flap was repositioned and sutured. Post operative instruction along with antibiotic, and analgesic for 5 days were prescribed. The patient was recalled after 7days for follow up and removing the sutures. The patient was completely symptomatic. A post operative radiograph was taken (Fig 1B). The patient was then recalled for follow up after 3-month, 6 months till 1 year. A radiograph was taken after 6 months (Fig 1C) and after 1 year which showed healing of periapical lesion (Fig 1D)



Fig 1A



Fig 1B



Fig 1C



Fig 1D

## Discussion

Although Nonsurgical Root canal treatment is a very reliable and ideal treatment for a tooth which need endodontic treatment with an evidence of remarkable high success rates ranging from 86 to 98% <sup>11</sup>. But in spite of that, there have been cases where the treatments have been unsuccessful even after following the highest technical standards <sup>12</sup>.

Endodontic surgery has been very successful in such cases where a non-surgical endodontic treatment has failed to achieve a good prognosis. The goal of Endodontic surgery is to create best conditions for tissue health, regeneration and formation of new tooth structural support by removal of pathological periapical tissue. Surgical endodontics has an advantage over non-surgical endodontics by the virtue to address the entire root canal system and complete elimination of bacteria<sup>13</sup>.

Song et al. in his study on micro surgical endodontic treatment of failed root canal treatments which had been previously treated with non-surgical endodontic treatment examined root apex and resected root surface under magnification. Among the common possible causes for failure was leakage around the canal filling material (30.4%), missing canal (19.7%), underfilling (14.2%), anatomical complexity (8.7%), and other factors (8.8%)<sup>14</sup>.

A failed root canal treatments with periapical lesion has been treated with nonsurgical retreatment or endodontic surgery. Because of lack of consensus among dental professionals in making such decision and also the recommendation for such treatments are mostly subjective and inconsistent <sup>15</sup>. Torabinejad et al. reported that initial success is more in endodontic surgery, but nonsurgical retreatment offers a more favorable long outcome <sup>16</sup>.

In both our cases Endodontic surgery was the recommended as an alternative treatment for failed non-surgical root canal treatments. Both the cases showed complete healing of the periapical lesion with success outcome both clinically as well as radiographically

## **Conclusion**

In cases where non-surgical endodontic treatment proves insufficient, Surgical endodontics seems to be a good treatment alternative. Advancements in apicoectomy armamentaria and materials have enabled endodontists to treat challenging cases with much greater efficacy. In both our cases endodontics surgery has proven to be very appropriate for treating failed non-surgical endodontic cases with satisfactory results.

## References

1. Kim S, Kratchman S. Modern endodontic surgery concepts and practice: a review. *J Endod.* 2006; 32:601-623
2. Borisova-Papancheva T., Panov VI., Papanchev G., Peev S. Conservative non-surgical management of an extensive periapical lesion – a case report. *MedInform* 2015; 2 (4): 364-369.
3. Siqueira Jr JF. Reaction of periradicular tissues to root canal treatment: benefits and drawbacks. *Endod Topics* 2005; 10:123-47.
4. De Deus QD. Frequency, location, and direction of the lateral, secondary, and accessory canals. *J Endod* 1975; 1:361-366.
5. Adorno CG, Yoshioka T, Suda H. Incidence of accessory canals in Japanese anterior maxillary teeth following root canal filling ex vivo. *Int Endod J* 2010;43:370-376.
6. Iqbal MK, Gartenberg J, Kratchman SI, Karabucak B, Bui B. The clinical significance and management of apical accessory canals in maxillary central incisors. *J Am Dent Assoc* 2005;136:331-335
7. Ricucci D, Langeland K. Apical limit of root canal instrumentation and obturation, part 2. A histological study. *Int Endod J* 1998;31:394-409
8. Gorni FG, Gagliani MM. The outcome of endodontic retreatment: a 2-yr follow-up. *J Endod.* 2004;30:1-4
9. Pinto D, Marques A, Pereira JF, Palma PJ, Santos JM. Long-term prognosis of endodontic microsurgery - a systematic review and meta- analysis. *Medicina Oral, Patología Oral e Cirurgia Bucal.* 2020;56:447
10. Zuolo ML, Ferreira MOF, Gutmann JL. Prognosis in periradicular surgery: a clinical prospective study. *International Endodontic Journal.* 2000;33(2):91–98.
11. Siqueira JF Jr. Aetiology of root canal treatment failure: why well-treated teeth can fail. *Int Endod J* 2001;34:1- 10.
12. Sharma DK, Gupta S, Bansal M, Popat K, Behra SS. Salvage through endodontic surgical management: A case report.

13. . Song M, Kim HC, Lee W, Kim E. Analysis of the cause of failure in nonsurgical endodontic treatment by microscopic inspection during endodontic microsurgery. *J Endod* 2011;37:1516-1519. *IP Indian Journal of Conservative and Endodontics* 2021;6(1):59–63
14. Reit C, Gröndahl HG. Management of periapical lesions in endodontically treated teeth. A study on clinical decision making. *Swed Dent J* 1984;8:1-7
15. Bell GW. A study of suitability of referrals for periradicular surgery. *Br Dent J* 1998;184:183-186
16. . Torabinejad M, Corr R, Handysides R, Shabahang S. Outcomes of nonsurgical retreatment and endodontic surgery: a systematic review. *J Endod* 2009;35:930-937