

## A Comparative Study To Evaluate Factors Responsible For Clinical Outcome Of Periradicular Surgery

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### Abstract

**Background:** Endodontic treatment is usually performed in teeth with periapical lesions. However, in some cases the pathology persists. Thus, periapical surgery has to be performed. It is considered to be the last treatment option before the extraction of a tooth. The main objective of periapical surgery is to seal the root canal system, thereby enabling healing by forming a barrier between the irritants within the confines of the affected root and the periapical tissue. **Aim:** To evaluate factors responsible for clinical outcome of periradicular surgery. **Materials and method:** The present study was conducted by combined effort of the department of conservative dentistry and endodontics and the department of oral surgery of the dental institute. For the study, we selected 25 patients scheduled for periradicular surgery. The surgical procedure was performed under local anesthesia. For the postoperative assessment, radiographs were done postoperatively. Analgesics were prescribed to the patients and sutures were removed after 4-7 days. Follow up was done at 6 to 12 months postoperatively and assessment of treatment success was done clinically and radiographically. The Cases with presence of pain, tenderness to percussion, tenderness to palpation of buccal mucosa, swelling of buccal mucosa were termed as clinical failures. The evaluation of case was also done radiographically. **Results:** We observed that 18 patients had preoperatively complaint of pain. The success rate of periradicular surgery in these patients is 86.7%. Similarly, significant difference was observed in preoperative clinical symptoms of tender to percussion, Presence of fistula, and resurgery cases. **Conclusion:** Within the limitations of current study, we conclude that tenderness on percussion, presence of fistula and resurgery cases are strongly associated with the success of periradicular surgery.

**Keywords:** Periradicular Surgery, Endodontics, Resurgery, Peri-Apical Lesion

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### INTRODUCTION

The Endodontic treatment is usually performed in teeth with periapical lesions. However, in some cases the pathology persists. Thus, periapical surgery has to be performed. It is considered to be the last treatment option before the extraction of a tooth. The main objective of periapical surgery is to seal the root canal system, thereby enabling healing by forming a barrier between the irritants within the confines of the affected root and the periapical tissue. The success of periapical surgery is

usually determined by both radiological signs and clinical signs and symptoms.<sup>1, 2</sup> The indications for periapical surgery, based on the protocol proposed by the Spanish Society of Oral Surgery are: 1) periapical disease affecting a permanent tooth subjected to endodontic treatment (of good quality), with pain and inflammation; 2) periapical pathology with prosthodontic or conservative restoration proven to be difficult to remove; 3) a radiopaque lesion measuring over 8 to 10 mm in diameter; 4) symptomatic gutta-percha overfilling, or presence of a foreign body not

amenable to orthograde removal (eg, fractured file); 5) other indications (patient requiring endodontic treatment and periapical surgery in a single session, fracture of the apical third, etc.).<sup>3-5</sup>

There is scarce information regarding prognostic factors in periapical surgery. Most studies evaluate the results with respect to the retrograde filling material used. Hence the present study is planned to evaluate factors responsible for clinical outcome of periradicular surgery.

## MATERIALS AND METHOD

The present study was conducted by combined effort of the department of conservative dentistry and endodontics and the department of oral surgery of the dental institute. The ethical approval for the study was obtained from the ethical committee of the institute prior to commencement of the study. For the study, we selected 25 patients scheduled for periradicular surgery. Patients with systemic conditions such as blood diseases, diabetes; chronic corticosteroids therapy; pregnant women; and patients allergic to local anesthetic solution (unknown cause) were excluded from the study. Information regarding the surgical procedure was given to the patients and an informed written consent was obtained. Patients were well-versed with other treatment options, i.e. endodontic treatment and extraction of the tooth. The surgical procedure was performed under local anesthesia. For the postoperative assessment, radiographs were done postoperatively. Analgesics were prescribed to the patients and sutures were removed after 4-7 days.

Follow up was done at 6 to 12 months postoperatively and assessment of treatment success was done clinically and radiographically. The Cases with presence of pain, tenderness to percussion, tenderness to palpation of buccal mucosa, swelling of buccal mucosa were termed as clinical failures. The evaluation of case was also done radiographically.

The statistical analysis of the data was done using SPSS software version 11.0 for windows. Student's t-test and Chi-square test were used to check the statistical significance of the data. A p-value less than 0.05 was predefined as statistical significant.

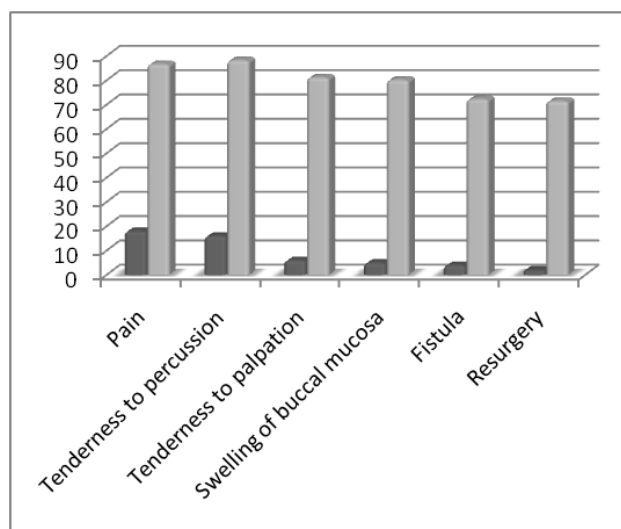
## RESULTS

Table 2 shows the effect of preoperative clinical symptoms on the success rate of periradicular surgery. We observed that 18 patients had preoperatively complaint of pain. The success rate of periradicular surgery in these patients is 86.7%. The result is statistically significant ( $p < 0.05$ ). Similarly, significant difference was observed in preoperative clinical symptoms of tender to percussion, Presence of fistula, and Resurgery cases.

**Table 1: Effect of preoperative clinical symptoms on success rate of peri-radicular surgery**

Clinical symptoms prior to surgery	No. of patients (n)	Success rate (%)	p-value
<b>Pain</b>	18	86.7	0.003*
<b>Tenderness to percussion</b>	16	88.3	0.02*
<b>Tenderness to palpation</b>	6	81.2	0.12
<b>Swelling of buccal mucosa</b>	5	80.2	0.81
<b>Fistula</b>	4	72.3	0.04*
<b>Resurgery</b>	2	71.5	0.01*

**Fig 1: Showing effect of preoperative clinical symptoms on success rate of peri-radicular surgery**



## DISCUSSION

Evaluation of success and failure following endodontic surgery is limited to three modalities: clinical assessment, radiographic evaluation, and, in some cases, histological analysis. Radiographic criteria established for the complete healing group and the unsatisfactory (failure) group has been reported to possess a high degree of reliability after 1- year follow-up. On the other hand, heterogeneity and alterations have been noted in cases assigned to the incomplete healing and uncertain categories, making long-term evaluation of the cases crucial to establish a definitive classification.<sup>6,7</sup>

The present study was planned to assess the various factors affecting the clinical outcome of periradicular surgery. We observed that significant results for the success of treatment are preoperative clinical symptoms of tender to percussion, Presence of fistula, and Resurgery cases.. The results of our study were consistent with other studies.

Kreisler M et al assessed the impact of patient- and tooth-related elements on the result of apical surgery in a multicenter hospital. A sum of 281 teeth in 255 patients experiencing periradicular surgery was researched clinically and radiographically 6 to 12 months postoperatively. The general achievement rate was 88.0%. Sex was a significant indicator,

with a win rate of 89.8% in females and 84.0% in males. The achievement rate was fundamentally higher in patients 31 to 40 years old. The treatment of premolars brought about a fundamentally higher achievement rate (91.9%) than the treatment of anterior teeth and molars. The loss of the buccal bone plate and the expansion of apical osteolysis to the furcation zone in molars brought about a significantly bring down progress rate. Injury measure, preoperative torment, delicacy to percussion, fistula, and resurgery were huge elements. The creators reasoned that there are a few variables impacting the achievement rate of apical surgery that must be considered while considering apical surgery as a treatment elective.<sup>8</sup>

In the present study, we observed that preoperative clinical symptoms of pain, tenderness to percussion, presence of fistula, and Resurgery cases were strongly associated with the success of the periradicular surgery. Zuolo ML et al presented an imminent report to assess the guess of periradicular surgery utilizing very much characterized case choice and a thorough surgical convention. Teeth to be dealt with surgically shown a periradicular sore of entirely endodontic beginning with or without clinical signs and indications of irritation. A sum of 114 teeth were dealt with. Following the impression of a full mucoperiosteal tissue fold, leftover delicate tissues were curetted, root closes were resected with a fine rapid precious stone pod, root-end cavities were arranged ultrasonically with jewel tips, and IRM root-end fillings were put. Cases were taken after clinically and radiographically for a period running from 1 to 4 years. The results of this investigation demonstrated 91.2% accomplishment out of a sum of 102 teeth accessible for development, in view of acknowledged parameters of assessment. Cases were viewed as successful if there were no clinical signs or indications show and there was radiographic confirmation of finish or scar tissue. The authors concluded that the adherence to a strict endodontic surgical convention and the utilization of contemporary systems and materials will bring about a typically effective result in an

extensive variety of teeth. Taschieri S et al assessed the 4-year achievement rate of endodontic surgery in mix with a collagen resorbable film for the treatment of totally periradicular sores. Patients with at least one tooth with a totally periradicular sore needing endodontic surgery was dealt with. A clinical and radiographic assessment was performed at 3, 6, 12, 24, 36, and 48 months. The result was classified at 1 and 4-year follow-up as progress, disappointment, and farfetched relying upon clinical signs and side effects and radiographic assessment. Fisher's correct test was utilized to assess contrasts amongst fruitful and fizzled cases. Forty-three teeth in 33 patients were radiographically and clinically assessed following 4 years. Thirty-eight teeth were delegated achievement, 4 teeth as disappointment, and 1 tooth as farfetched. No factually critical contrasts were found in comes about identified with tooth sort, tooth area, and nearness of post. The relationship of endodontic surgery and guided tissue recovery for the treatment of totally periapical sores prompts magnificent results up to 4 years. Institutionalized criteria are expected to decide the treatment result.<sup>9,10</sup>

## CONCLUSION

Within the limitations of current study, we conclude that tenderness on percussion, presence of fistula and resurgery cases are strongly associated with the success of periradicular surgery.

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**Conflict of Interest: None**

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