

## ORIGINAL RESEARCH

### Evaluation of the profile of patients undergoing peri-apical surgeries

Shelly Singh

Clinic Head and Sr. Consultant Endodontist, Clove Dental, Panchkula sector 20, Chandigarh tricity zone, India

#### ABSTRACT:

**Background:** Periapical surgery is now a reliable therapeutic procedure for the treatment of teeth with periapical lesions, particularly when orthograde retreatment is problematic. However, little information is available regarding treatment planning of cases referred for periapical surgery. Hence, this study was conducted to evaluate the profile of patients undergoing peri-apical surgeries. **Material and method:** This retrospective study included a data of 80 patients. All the demographic details of the patients were obtained. Complete clinical and radiographic pre-operative findings were collected. Based on age, patients were categorised into 3 groups: Group 1: 20-30 years, Group 2: 31-40 years and Group 3: 41-50 years. Cases of periapical pathology were also segregated based on their occurrence in the maxilla and mandible respectively. SPSS software was used for statistical analysis. **Results:** In the current study, 28 out of 80 patients belonged to the age group of 20-30 years (35%). 41.25% and 23.75% patients were from group 2 and group 3 respectively. Males comprised of 58.75% of the total cases (n=47) whereas rest 41.25% were females (n=33). The current study observed that out of 80 cases, 44 cases of peri-apical surgery were in maxilla and the rest 45 % cases were in mandible. It was seen that maximum peri-apical surgeries were carried out in single rooted teeth with predominance in maxilla.. It was seen that majority of cases in which peri-apical surgery was performed had a chronic infection of unclear reason despite radiographically good root canal filling (n=39). **Conclusion:** Most of the cases where peri-apical surgeries were opted had an unclear reason for chronic infection despite good endodontic treatment. Also most of the peri-apical surgeries were carried out in single rooted teeth of upper and lower jaws.

**Key words:** Periapical surgery, case selection, treatment planning.

Received: 2 April, 2020

Accepted: 27 April, 2020

**Corresponding author:** Dr. Shelly Singh, Clinic Head and Sr. Consultant Endodontist, Clove Dental, Panchkula sector 20, Chandigarh tricity zone, India

**This article may be cited as:** Singh S. Evaluation of the profile of patients undergoing peri-apical surgeries. Int J Res Health Allied Sci 2020; 6(3):59-62.

#### INTRODUCTION

Apical surgery belongs to the field of endodontic surgery, which also includes incision and drainage, closure of perforations, and root or tooth resections. The objective of apical surgery is to surgically maintain a tooth that primarily has an endodontic lesion that cannot be resolved by conventional endodontic (re-)treatment<sup>1</sup>. Whenever possible, nonsurgical retreatment is regarded as the treatment of choice. However, where nonsurgical retreatment is not an option, periapical surgery (endodontic surgery) is considered to be a viable alternative<sup>2</sup>.

Bacterial infection of the dental pulp may lead to periapical lesions. They are generally diagnosed either during routine dental radiographic examination or following acute pain in a tooth<sup>3-4</sup>. Most periapical

lesions (>90%) can be classified as dental granulomas, radicular cysts or abscesses. The incidence of cysts within periapical lesions varies between 6 and 55%. The occurrence of periapical granulomas ranges between 9.3 and 87.1%, and of abscesses between 28.7 and 70.07%<sup>5-7</sup>.

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>8-9</sup>. Hence, this study was conducted to evaluate the profile of patients undergoing peri-apical surgeries.

## MATERIAL AND METHODS

The purpose of this study was to evaluate the profile of patients undergoing peri-apical surgeries. This retrospective study included a data of 80 patients who had undergone a periapical surgery atleast 6 months prior to the commencement of the study. All the demographic details of the patients were obtained. Complete clinical and radiographic pre-operative findings were collected. Patients who were missing records or had poor quality radiographs were excluded from the study. Based on age, patients were categorised into 3 groups: Group 1: 20-30 years, Group 2: 31-40 years and Group 3: 41-50 years. Cases of periapical pathology were also segregated based on

their occurrence in the maxilla and mandible respectively.

Entire data was recorded in the Microsoft excel sheets. SPSS software was used for statistical analysis. Chi square test and student T test were use to compare the variables. P-value of less than 0.05 was considered significant.

## RESULTS

In the current study, 28 out of 80 patients belonged to the age group of 20-30 years (35%). 41.25% and 23.75% patients were from group 2 and group 3 respectively (table 1). Males comprised of 58.75% of the total cases (n=47) whereas rest 41.25% were females (n=33). {table 2}

Table 1 : Cases of periapical surgery in different age groups.

Age	Number of cases	Percentage
Group 1: 20-30 years	28	35%
Group 2: 31-40 years	33	41.25%
Group 3: 41-50 years	19	23.75%

Table 2: Cases of periapical surgery in different gender.

Gender	Number of cases	Percentage
Male	47	58.75%
Female	33	41.25%

The current study observed that out of 80 cases, 44 cases of peri-apical surgery were in maxilla and the rest 45 % cases were in mandible (table 3). It was seen that maximum peri-apical surgeries were carried out in single rooted teeth with predominance in maxilla. Very few cases of peri-apical surgeries were carried out in multi-rooted teeth (table 4).

Table 3: Cases of periapical surgery in maxilla and mandible

Jaw	Number of cases	Percentage
Maxilla	44	55%
Mandible	36	45%

Table 4: Teeth involved in peri-apical surgeries.

Tooth	Maxilla	Mandible
Central incisor	12	9
Lateral incisor	9	8
Canine	14	15
First premolar	2	0
Second premolar	5	1
First molar	1	2
Second molar	1	1

It was seen that majority of cases in which peri-apical surgery was performed had a chronic infection of unclear reason despite radiographically good root canal filling (n=39). Overfilling and fractured instruments accounted for 28.75% and 22.5% of cases in which apical surgery was opted (table 5).

Table 5 : Probable causes forcing to opt for apical surgery

Cause	No of cases	Percentage
1. Fractured instrument in the canal	18	22.5
2. Over filling/filling extrusion beyond the apex	23	28.75
3. Good root canal filling, but cause of periapical pathology unclear	39	48.75

## DISCUSSION

Persistent apical periodontitis following orthograde root-canal treatment is common among adult populations in various countries, with prevalence rates varying between 27%-70% and increasing with age (1). Conventional root-canal treatment is considered to be the best method of managing periapical disease, with success rates varying between 48%-98%<sup>10-11</sup>.

indications for apical surgery comprise (1) radiological findings of apical periodontitis and/or symptoms associated with an obstructed canal (the obstruction proved not to be removable, displacement did not seem feasible or the risk of damage was too great), (2) extruded material with clinical or radiological findings of apical periodontitis and/or symptoms continuing over a prolonged period, (3) persisting or emerging disease following root-canal treatment when root canal re-treatment is inappropriate, and (4) perforation of the root or the floor of the pulp chamber and where it is impossible to treat from within the pulp cavity<sup>12</sup>.

In the current study, 28 out of 80 patients belonged to the age group of 20-30 years (35%). 41.25% and 23.75% patients were from group 2 and group 3 respectively (table 1). Males comprised of 58.75% of the total cases (n=47) whereas rest 41.25% were females (n=33). Göksel Şimşek-Kaya et al retrospectively assessed clinical and radiographic data from patients undergoing periapical surgery. The factors involved in deciding to perform periapical surgery were classified into technical, biological, and combined factors. Out of 821 patients, 544 (66.3%) underwent endodontic treatment/retreatment, 204 (24.8%) were treated with coronal restorations and 60 (7.3%) were treated with post. Periapical surgery was indicated for biological reasons in 35% of patients and for technical reasons in 17.9%. The common biological factor was persistent clinical symptoms (19.7%). The most common technical cause was failure of previous endodontic treatment (66.3%). Nearly half of all periapical lesions (45%) were <5 mm in size. Periapical surgery was justified in only 434 (52.9%) subjects<sup>13</sup>.

The current study observed that out of 80 cases, 44 cases of peri-apical surgery were in maxilla and the rest 45 % cases were in mandible (table 3). It was seen that maximum peri-apical surgeries were carried out in single rooted teeth with predominance in maxilla. Very few cases of peri-apical surgeries were carried out in multi-rooted teeth (table 4). Mireia Serrano-Giménez et al did a systematic review on prognostic factors on periapical surgery. A search of articles published in Cochrane, PubMed (MEDLINE) and Scopus was conducted with the key words “prognostic factors”, “prognosis”, “periapical surgery”, “endodontic surgery” and “surgical endodontic treatment”. The inclusion criteria were articles including at least 10 patients, published in English, for the last 10 years. The exclusion criteria were nonhuman studies and case reports. 33 articles

were selected from 321 initially found. Ten articles from 33 were excluded and finally the systematic review included 23 articles: 1 metaanalysis, 1 systematic review, 2 randomized clinical trials, 6 reviews, 12 prospective studies and 1 retrospective study. They were stratified according to their level of scientific evidence using the SORT criteria. Factors associated with a better outcome of periapical surgery are patients ≤45 years old, upper anterior or premolar teeth, ≤10 sized lesions, non cystic lesions, absence of preoperative signs and symptoms, lesions without periodontal involvement, teeth with an adequate root-filling length, MTA as root-end filling material, uniradicular teeth, absence of perforating lesions, apical resection < 3 mm, teeth not associated to an oroantral fistula and teeth with only one periapical surgery<sup>14</sup>.

It was seen that majority of cases in which peri-apical surgery was performed had a chronic infection of unclear reason despite radiographically good root canal filling (n=39). Overfilling and fractured instruments accounted for 28.75% and 22.5% of cases in which peri-apical surgery was opted (table 5). Thomas von Arx conducted a review on the current techniques and outcome of apical surgeries. He found that It is often a last resort to surgically maintain a tooth with a periapical lesion that cannot be managed with conventional endodontic (re-)treatment. The main goal of apical surgery is to prevent bacterial leakage from the root-canal system into the periradicular tissues by placing a tight root-end filling following root-end resection. Clinicians are advised to utilize a surgical microscope to perform apical surgery to benefit from magnification and illumination. In addition, the application of microsurgical techniques in apical surgery, i.e., gentle incision and flap elevation, production of a small osteotomy, and the use of sonic- or ultrasonic driven microtips, will result in less trauma to the patient and faster postsurgical healing. A major step in apical surgery is to identify possible leakage areas at the cut root face and subsequently to ensure adequate root-end filling. Only a tight and persistent apical obturation will allow periapical healing with good long-term prognosis. The present paper describes current indications, techniques and outcome of apical surgery<sup>12</sup>.

## CONCLUSION

From the above study the author concluded that most of the cases where peri-apical surgeries were opted had an unclear reason for chronic infection despite good endodontic treatment. Also most of the peri-apical surgeries were carried out in single rooted teeth of upper and lower jaws.

## REFERENCES

1. Baek S.H., Plenk H., Kim S. Periapical tissue responses and cementum regeneration with amalgam, SuperEBA, and MTA as root-end filling materials. *J. Endodont.* 2005;31:444-449.

2. Rahbaran S, Gilthorpe MS, Harrison SD, Gulabivala K. Comparison of clinical outcome of periapical surgery in endodontic and oral surgery units of a teaching dental hospital: a retrospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;91:700–9.
3. 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;89:475–84.
4. Barbakow FH, Cleaton-Jones PE, Friedman D. Endodontic treatment of teeth with periapical radiolucent areas in a general dental practice. *Oral Surg.* 1981;51:552–9.
5. Bhaskar SN. Oral surgery--oral pathology conference No.17, Walter Reed Army Medical Center. Periapical lesions--types, incidence, and clinical features. *Oral Surg Oral Med Oral Pathol.* 1966;21:657–71.
6. Lalonde ER, Leubke RG. The frequency and distribution of periapical cysts and granulomas. *Oral Surg Oral Med Oral Pathol.* 1986;25:861–8.
7. Nair PNR, Pajarola G, Schroeder HE. Types and incidence of human periapical lesions obtained with extracted teeth. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1996;81:93–102.
8. Ebell MH, Siwek J, Weiss BD, Woolf SH, Susman J, Ewigman B. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *J Am Board Fam Pract.* 2004;17:59–67.
9. Barone C, Dao TT, Basrani BB, Wang N, Friedman S. Treatment outcome in endodontics: the Toronto study--phases 3, 4, and 5: apical surgery. *J Endod.* 2010;36:28–35
10. Kabak Y, Abbott PV. Prevalence of apical periodontitis and the quality of endodontic treatment in an adult Belarusian population. *Int Endod J.* 2005;38:238–45.
11. Rahbaran S, Gilthorpe MS, Harrison SD, Gulabivala K. Comparison of clinical outcome of periapical surgery in endodontic and oral surgery units of a teaching dental hospital: a retrospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;91:700–
12. von Arx T. Apical surgery: A review of current techniques and outcome. *Saudi Dent J.* 2011;23(1):9-15. doi:10.1016/j.sdentj.2010.10.004
13. Şimşek-Kaya G, Saruhan N, Yapıcı-Yavuz G, Ertaş Ü. A decision analysis for periapical surgery: Retrospective Study. *J Clin Exp Dent.* 2018;10(9):e914-e920. Published 2018 Sep 1. doi:10.4317/jced.53334
14. Serrano-Giménez M, Sánchez-Torres A, Gay-Escoda C. Prognostic factors on periapical surgery: A systematic review. *Med Oral Patol Oral Cir Bucal.* 2015;20(6):e715-e722. Published 2015 Nov 1. doi:10.4317/medoral.20613