

Retrospective Assessment of Apicectomy Performed in a Known Population: An Institutional Based Study

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ABSTRACT

Background: Apical surgery or Apicectomy is often a last resort to surgically maintain a tooth with a periapical lesion that cannot be managed with conventional endodontic treatment. The present study was conducted to assess retrospectively cases of apicectomy performed in a known population.

Materials and Methods: This retrospective study was conducted to assess the patients treated with apicectomy over the time of 6 months. Preoperative periapical radiograph was taken using a parallel technique. Local anesthesia was administered and followed by flap elevation.

Surgical curette was used to enucleate the pathologic tissue and identify the root apex with/without prior osteotomy. The apical 3 mm of the root was resected perpendicularly to the long axis of the tooth with no or minimal bevel. Flaps were repositioned and sutured. Periapical radiograph was taken after surgery using the parallel technique. Antibiotics and analgesics medication were prescribed. Follow-up appointments were arranged. The data was included which comprises of demographic data, preoperative clinical examination type. Statistical analysis was performed using the SPSS software version 21.0 (SPSS Inc., Chicago, IL, USA).

Results: In this retrospective study total 87 cases of apicectomy was recorded over the period of 6 months in which

23(26.43%) were male while remaining 64(73.56%) were females. Apicectomy cases were prevalent in age group 31-40 years (36.78%). Apicectomy cases were prevalent in maxillary tooth(73.56%).

Conclusion: Our study concluded that apicectomy cases were prevalent in females, in age group of 31-40 years and in posterior tooth.

Keywords: Apicectomy, Periapical Radiograph, Periapical Lesion.

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INTRODUCTION

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%.²

Apical periodontitis (AP) is primarily a sequela to dental caries caused by infection of the root canal system.³ Indications for apical surgery have been updated in the past by the ESE (European Society of Endodontology, 2006) and it includes the following:

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 high).

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.

4. Perforation of the root or the floor of the pulp chamber and where it is impossible to treat from within the pulp cavity.⁴

Apicectomy involves the surgical removal of tooth root apex or root end resection which can be done alone or in combination with placing a retrograde filling in order to seal the apical part of the root.⁵

In the year 1884, Apicectomy procedure was well described and defined by J. Farrar as "a bold act, which removes the entire cause [of disease] and which will lead to a permanent cure which may not be the best in the end, but the most humane."⁶

According to Black, the root-resection technique i.e. amputation of the root apex has been originated as a treatment for "pyorrhoea alveolaris" complicated by a dental abscess in the late years of the 19th century as a valid alternative to a dental extraction.⁷ Apicectomy (root resection or root amputation) signifies the removal of the apices of pulpless teeth in which satisfactory root or pulp canal therapy has been performed. This operation is performed to remove known or unknown infection, granulation tissue or cystic areas that involve these teeth; yet retaining the major portion of the roots in situ.⁸ The present study was conducted to assess retrospectively cases of apicectomy performed in a known population.

MATERIALS AND METHODS

This retrospective study was conducted to assess the patients treated with apicectomy over the time of 6 months. Before commencement of study, permission was taken from the ethical committee of the institute. Patients who provide complete information regarding age, gender, tooth type, information whether the previous root canal treatment was primary or retreatment, information whether the previous periapical surgical treatment was primary or retreatment, coronal restorations, and clinical symptom and good quality radiographs were included in the study. Patients who were missing records or had poor quality radiographs were excluded from the study. Preoperative periapical radiograph was taken using a parallel technique. Local anesthesia was administered and followed by flap elevation. Surgical curette was used to enucleate the pathologic tissue and identify the root apex with/without prior osteotomy. The apical 3 mm of the root was resected perpendicularly to the long axis of the tooth with no or minimal bevel. Flaps were repositioned and sutured. Periapical radiograph was taken after surgery using the parallel technique. Antibiotics and analgesics medication were prescribed. Follow-up appointments were arranged. The data was included which comprises of demographic data (gender and age), preoperative clinical examination type (tooth type). Statistical analysis was performed using the Statistical Package for the Social Sciences software version 21.0 (SPSS Inc., Chicago, IL, USA).

Table 1: Demographic data

Category	N(%)
Gender	
Male	23(26.43%)
Female	64(73.56%)
Age	
21-30	8(9.19%)
31-40	32(36.78%)
41-50	24(27.58%)
51-60	16(18.39%)
61-70	5(5.74%)
>70	2(2.29%)

Table 2: Preoperative clinical examination

Tooth type	N(%)
Maxillary tooth	64(73.56%)
Mandibular tooth	23(26.43%)

RESULTS

In this retrospective study total 87 cases of apicectomy was recorded over the period of 6 months in which 23 (26.43%) were male while remaining 64 (73.56%) were females. Apicectomy cases were prevalent in age group 31-40 years (36.78%). Apicectomy cases were prevalent in maxillary tooth (73.56%).

DISCUSSION

In deciding whether or not to perform endodontic surgery, clinicians need to weigh a number of factors, including whether or not a patient's symptoms include discomfort; whether the goal of treatment is esthetic and/ or functional improvement; whether or not surgery has been performed previously, and if so, the outcome; whether or not a patient has a medical history that might influence treatment; clinical and radiological findings; experience of the clinician; and the economic status of the patient.⁹ Other patient-related factors that play a role in the choice between endodontic retreatment and surgical intervention include the risk of complications due to proximity to nerves and other structures and the presence of prosthetic restorations.^{9,10}

In this retrospective study total 87 cases of apicectomy was recorded over the period of 6 months in which 23(26.43%) were male while remaining 64(73.56%) were females. Apicectomy cases were prevalent in age group 31-40 years (36.78%). Apicectomy cases were prevalent in maxillary tooth(73.56%).

A retrospective study by Abramovitz et al. found 70% of teeth were indicated for periapical surgery due to technical factors, with 40% involving coronal restorations with posts and 30% involving coronal restorations without posts.¹⁰ A retrospective study found that maxillary teeth appear to undergo conventional root canal treatment more often than mandibular teeth.⁵ In addition, the central incisors were the most common mandibular teeth to undergo periapical surgery.¹⁵

One research proposed that male patient presented poorer success rate, but the differences may be caused by the sample discrepancy.¹¹

Endodontic surgery, once thought to be the treatment of the last resort, has advanced in the recent years and increases the clinicians' ability to achieve more predictable clinical outcome with a success rate exceeding 90%. Age, gender, tooth type, root-end filling material, and the magnification system had no significant effect on the proportion of success.^{12,13}

CONCLUSION

Our study concluded that apicectomy cases were prevalent in females, in age group of 31-40 years and in posterior tooth.

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