

Assessment of Outcome of Endodontic Surgery in Maxillary First Molar Cases: A Clinical Study

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ABSTRACT

Background: Endodontic surgery can be applied both to the anterior and posterior regions on the maxilla and mandible. The present study was conducted to assess the outcome of cases of endodontic surgery in study group.

Materials & Methods: The present study was conducted on 52 cases of both genders. Only those cases which had periapical lesions in maxillary first were included.

In all cases, endodontic access preparation was made and root canal treatment was done. Apices of the molar were resected and no retrograde cavity was prepared and no root-end filling was used. All debris were irrigated with normal saline until the surgical field became clean. The flap was sutured with a resorbable Vicryl 4/0 suture. The patient was recalled post-operatively on 3 day, one week, 4 weeks, 6 months and 1 year.

Results: Out of 52 cases, males were 30 and females were 22. At 4 weeks, there was 0.4 mm, at 6 months 1.6 mm and at 1 year 2.0 mm bone deposition around the teeth. The difference was significant ($P < 0.05$).

Conclusion: Endodontic surgery has better outcome. We obtained good results of maxillary first molar surgeries followed upto 1 year.

Keywords: Bone, Endodontic surgery, Maxillary molar.

INTRODUCTION

Endodontic surgery is a standard procedure which enhances the retention survival rate of many teeth which cannot be treated only endodontically (inaccessibility to the apical part of the root by a coronal approach due to posts, root fractures, separated instruments in root canals, calcified and tortuous root canals, dens in dente, , etc.). Endodontic surgery can be applied both to the anterior and posterior regions on the maxilla and mandible. In posterior regions the surgical procedure is more difficult due to anatomical conditions (maxillary sinus, mandibular canal,

number of root canals, inaccessible posterior oral cavity, etc).¹

Non-surgical endodontic management of periapical lesions is a routine predictable procedure for treatment because of its high success rate. However, there are valid indications for endodontic surgery. When it is indicated in the anterior region it is usually done without hesitation, but if it is necessary to perform it in the posterior region, endodontic surgery is often avoided and replaced by tooth extraction and implantation or intentional replantation of mandibular premolars and molars.² The reasons to bypass endodontic surgery in the

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posterior region may be anatomical structures such as the maxillary sinus, the mandibular canal, limited access in this part of the oral cavity and lack of operator experience. When endodontic surgery is the only choice to keep the tooth it should not be avoided. However, it is necessary to have full knowledge of the surgical technique and the anatomical structures and variations.³ The present study was conducted to assess the outcome of cases of endodontic surgery in study group.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It comprised of 52 cases of both genders. Only those cases which had periapical lesions in maxillary first molars were included. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained from institutional ethical committee.

General information such as name, age, gender etc. was recorded. In all cases, endodontic access preparation was made without anaesthesia. The necrotic pulp tissue was extirpated followed by irrigation with sodium hypochlorite 5.25%, citric acid 40% and normal saline. Working length was determined by taking intraoral periapical radiographs and the root canals were prepared. The root canals were filled with a sealer by applying the method of warm vertical condensation. Under local anesthesia the triangular muco-periosteal flap was opened. All necrotic bone was curetted via bone curette until the bone become clean, hard and healthy. Apices of the molar were resected and no retrograde cavity was prepared and no root-end filling was used. All debris were irrigated with normal saline until the surgical field became clean. The flap was sutured with a resorbable Vicryl 4/0 suture. The patient was recalled post-operatively on 3 day, one week, 4 weeks, 6 months and 1 year. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table 1: Distribution of cases.

Total- 52		
Gender	Males	Females
Number	30	22

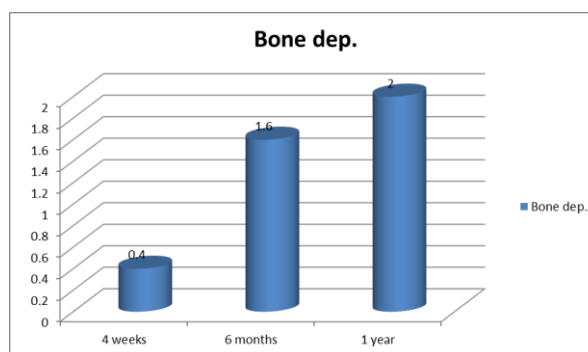
Table I shows that out of 52 cases, males were 30 and females were 22.

Table 2: Comparison of bone formation at 4 weeks, 6 months and 1 year.

Mean bone formation (mm)	4 weeks	6 months	1 year	P value
	0.4mm	1.6mm	2.0 mm	0.01

Table II, graph I shows that at 4 weeks, there was 0.4 mm, at 6 months 1.6 mm and at 1 year 2.0 mm bone deposition around the teeth. The difference was significant ($P < 0.05$).

Graph I: Bone formation at 4 weeks, 6 months and 1 year



DISCUSSION

Categories of endodontic surgery are periapical surgery, hemisection/root amputation, intentional replantation and corrective surgery. Periapical surgery includes resection of a portion of the root that contains undebrided or unobturated (or both) canal space. It can also involve reverse filling and sealing of the canal when conventional root canal treatment is not feasible.⁴ It is often performed in conjunction with apical curettage for reasons explained later. Indication for periapical surgery are occasionally an unusual entity in the periapical region requires surgical removal and biopsy for identification, occasionally when the cause of root canal failure cannot be identified so surgical exploration may be necessary, restorative consideration that compromise treatment or procedural error during treatment etc.⁵

In present study out of 52 cases, males were 30 and females were 22. We included only those maxillary first molars who had periapical lesions. Papancheva et al⁶ in their study the endodontic treatment was performed on tooth #36, followed by endodontic obturation of the root canal system. In two days an apicoectomy without retrograde filling was performed. One year after the apicoectomy there was complete healing of the periapical lesion with new bone formation and no symptoms in the patient. We found that at 4 weeks, there was 0.4 mm, at 6 months 1.6 mm and at 1 year 2.0 mm bone deposition around the teeth.

In case of an endodontic retreatment, the first step is a careful examination of the tooth. Because the restorative material changes the external anatomy of the dental crown, creating the access cavity and locating the orifices becomes more difficult. In the majority of cases, removing all the filling is the best option, so the endodontic space becomes more visible. Misapprehension regarding the internal morphology of the endodontic space and incomplete cleaning of it represents one of the various failures of the endodontic treatment. At the upper first molar level, missing and not cleaning the fourth canal might develop in time a periapical lesion. In endodontic literature, although the percentages in which two mesiobuccal canals exist within this root vary according to the various authors, they all agree on one fact: the upper first molar has four canals unless is demonstrated the opposite.⁷

They may compromise root canal treatment, throughout preventing instrumentation, obturation, or both. Because a canal is always present, failure to debride and obturate may lead to failure. Although the outcome may be questionable, it is preferable to attempt conventional root canal treatment or retreatment before apical surgery. If this is not possible, removing or resecting the uninstrumented and unfilled portion of the root and placing a root end filling may be necessary.⁸

When there is crown on a mandibular incisor. An opening could compromise retention of the restoration or perforate the root. Rather than attempt the root canal treatment, root resection and root-end filling may be preferred treatment option. Occasionally, after a traumatic root fracture, the

apical segment undergoes pulp necrosis. Because this cannot be predictably treated from a coronal approach, the apical segment is removed surgically after root canal treatment of the coronal portion.⁹

CONCLUSION

Endodontic surgery has better outcome. We obtained good results of maxillary first molar surgeries followed upto 1 year.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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