



A case of periapical surgery: apicoectomy and obturation of the apex.

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ABSTRACT: This paper reports a case of a recurrent periapical cyst treated with enucleation of the lesion, apicoectomy, and root end obturation. In the case of conventional root canal treatment failure, non-surgical retreatment is the preferred option in most of the cases. The authors have performed root-end resection and preparation on 11, 12, 21, 22, 23 & 24. The root canal filling is placed within the new cavity to close the path of communication between the infected root canal system and periradicular structures with an intermediate restorative material (MTA). The lesion was fully enucleated. The 29-year-old male patient was followed up at 2 weeks, 6 months presenting as a functional and symptomless tooth. All these factors highlight a positive prognosis for the tooth after periradicular surgery, which is now considered a valid treatment to keep the tooth as a functional unit in the oral cavity.

KEYWORDS- Periapical infection, Apicoectomy, Root end filling, flap.

I. INTRODUCTION

Peri-apical surgery belongs to the field of endodontic surgery that also includes incision and drainage, closure of perforations, and root or tooth resections. The objective of peri-apical surgery is to surgically maintain a tooth or teeth, has an endodontic lesion which cannot be resolved by conventional endodontic (re-) treatment (1). This goal should be achieved by root-end resection, root-end cavity preparation, and a bacteria-tight closure of the root-canal system at the cut root end with a retrograde filling. In addition, the periapical pathological tissue should be completely debrided by curettage in order to remove any extraradicular infection, foreign body material, or cystic tissue. This surgery has greatly benefited from continuing development and introduction of new diagnostic tools, surgical instruments and materials, making this method of tooth maintenance more predictable. Success rates approaching 90% or above have been documented in several clinical studies.

II. CASE REPORT

A 29-year-old male patient reported to the authors' clinic with chief complaint of mild pain, swelling and mobility of tooth in upper front region of jaw since one month. Patient was apparently asymptomatic 1 month back then he noticed swelling over front palatal region of jaw which was initially small and gradually increased to present size. Swelling was soft, firm and tender on palpation. Mobility was present with respect to upper front teeth. Swelling was not associated with pain or fever. For the same patient did not take any medication. Palatal swelling was present associated with 11, 21, 22, 23 and 24 (Figure no.1). Cold vitality test was done for tooth no 11, 21, 22, 23 and 24. Negative response with 11, 21, 22 and 23. Delayed response with 24. Intraoral periapical radiograph revealed a blunderbuss root apex with thin lateral dentinal walls with respect to left side lateral incisor associated with a large periapical pathology (Figure no 2-3). Fine needle aspiration (FNAC) was negative. Intentional root canal treatment of tooth 11, 12, 21, 22, 23 and 24 were planned. Surgical enucleation of cystic lining. Cystic cavity filler up with PRF + abgel. Endodontic and surgical treatment plan explained in table no 1.

- Access opening with 11, 21, 22, 23 and 24
- Cleaning and shaping with 11, 21, 22, 23 and 24
- MTA Apexification with 22 (Open Apex)
- Obturation with 11, 21, 22, 23 and 24

Treatment plan was explained to the patient and an informed consent was obtained. Root canal treatment was initiated with access opening with tooth no. 11, 21, 22, 23 and 24. Working length was determined and confirmed radiographically (Figure no 5, 6, 7). The canal was then irrigated with 3% sodium hypochlorite and 2% chlorhexidine (Dentchlor, Prime Dent) and saline was used as an intermediate irrigant. Cleaning and shaping was



completed. Tooth 11, 21- #60K and Tooth 23 - #50K and step back was done. Tooth 22- shaping was done using #60H file. Tooth no.- 24 Mesial and palatal canals were instrumented using hand Protaper file till F2. Ca(OH)₂ dressing was given after cleaning and shaping in the form of Metapex. Patient was re-called after 3 weeks. After 3 weeks follow up no radiographic changes were noted in lesion and tooth became symptomatic. Surgical removal of the lesion was planned. At the next appointment after the Metapex removal canal started draining. Purulent discharge was present from 11, 21, 22 & 23. Dry calcium hydroxide powder was placed inside the canals until the canals become dry. After 2 appointments canals were completely dry. Obturation with 11, 21, 22, 23 & 24 was done 1 day before surgery (Figure no 8). Before Obturation with 22, MTA apexification was planned as open apex present with respect to 22. MTA Plug was given with 22. Wet cotton was placed on MTA and patient was re-called after 24 hours (figure no 9). Canals were dried using paper points and obturated using AH plus sealer (figure no 10). Obturation of tooth 22 was done using roll-cone technique (figure no 11).

A crevicular incision was marked and made with an anterior releasing incision preserving the interdental papilla between 12 and 24 to expose the lesion site. A full thickness triangular mucoperiosteal flap was reflected and lesion site was exposed (figure 12-13). Thin and expanded buccal cortical bone was removed by making an oval window made by round bur (figure no- 14). The cystic lining was identified, separated and removed in toto (figure no- 15). Retrograde restoration was done by using MTA. Use ab-gyl and plasma rich fibrin for reduce dead space. Closure done by using 3-0 vicryl absorbable suture. Post-operatively patient teeth mobility and palatal swelling was reduced (figure no- 16).

III. DISCUSSION

The management of large cystic lesions has been the subject of prolonged debate. The treatment options for large periapical lesions range from conventional nonsurgical root canal treatment with long-term calcium hydroxide therapy to various surgical interventions. After the failure of the conventional root canal treatment (RCT), non-surgical retreatment is the preferred option in most cases. Several factors, such as a complex root canal system or previous procedural accidents, may impede the success of non-surgical retreatment (2). In these cases, periradicular surgery and apicoectomy would be the treatment of choice to preserve the tooth.

Indications for apical surgery have been recently updated by the ESE (European Society of Endodontology, 2006) (3) and include 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 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.
- (4) Perforation of the root or the floor of the pulp chamber and where it is impossible to treat from within the pulp cavity.

For root-end filling, a variety of materials have been propagated in the past. Almost every material that was introduced in operative and restorative dentistry as a temporary (SuperEBA, IRM, Cavit, etc.) or permanent (gold, amalgam, resin composite, glass ionomere cement, compomere, etc.) restoration material was sooner or later also utilized in apical surgery. However, mineral trioxide aggregate (MTA) appears to have become the gold standard for a root-end filling material. All clinical comparative studies published to date have reported higher success rates for MTA than for the competitor material (4-9), although the differences were not found to be significant (probably due to the number of treated cases). Although MTA is an expensive material and the clinician has to become familiar with its handling, it has major advantages, including excellent biocompatibility.

Teeth with an apico-marginal communication undergoing apical surgery may benefit from further advances and refinement of regenerative techniques. However, due to increased cost and surgical difficulty, regenerative techniques should only be incorporated in apical surgery when indicated, and should be performed by clinicians with appropriate training.

IV. CONCLUSION

Apical surgery is now considered a predictable treatment option to save a tooth with apical pathology that cannot be managed by conventional, non-surgical endodontics. Appropriate treatment modality should be applied to the patients, which in turn improves the patients' quality of life.

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Figure no 1



Tooth no- 11 & 21 Figure no- 2



Tooth no- 22,23,24 Figure no 3 & 4



Tooth 11 & 21 - 22 mm



Tooth 22 - 19 mm Tooth 23-24 mm & Tooth 24 - M and P - 20 mm

Figure no 5,6,7



Figure no 8



Figure no 9 (MTA plug with 22)



Figure no. 10



Figure no. 11



Figure 12-13



Figure 14



Figure 15