

Review Article

Endodontic Surgery – A Review

Arka Prova Bhattacharjee¹, Raja Satish Prathigudupu², Shalini Singh³, Yesh Sharma⁴, Kritika Sehrawat⁵, Rahul VC Tiwari⁶

¹PG Student, Department Of Conservative Dentistry and Endodontics, ²Professor, Department of Oral and Maxillofacial Surgery, Sibar Institute of Dental Sciences, Ntruhs, Guntur, A.P, India, ³PG Student, Department Of Conservative Dentistry and Endodontics, Vyas Dental College & Hospital, Jodhpur, Rajasthan, India, ⁴PG Student, Department Of Conservative Dentistry and Endodontics, Maharaja Ganga Singh Dental College, SriGanga Nagar, Rajasthan, India, ⁵PG Student, Department of Oral and Maxillofacial Surgery, Sudha Rustagi Dental College and Research Centre, Faridabad, Haryana, India, ⁶Fellow in Orthognathic Surgery, Department of Oral & Maxillofacial Surgery and Dentistry, Jubilee Mission Medical College Hospital and Research Institute, Thrissur, Kerala, India

ABSTRACT:

Endodontic surgery has now evolved into endodontic microsurgery. Nowadays each tooth may be managed with endodontic surgery and concept of extraction has been abolished. Carious lesion with periapical pathology is managed with the endodontic therapy. The access opening, bio- mechanical preparation followed by obturation and restoration are steps of endodontic therapy or root canal treatment. There is no need of raising the surgical flap. Whenever, access is achieved via surgical flap, the procedure is known as surgical endodontics. The present review article focuses on various indication and category of endodontic surgery.

Key words- Bio- mechanical, Carious, Endodontic surgery

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Corresponding author: Dr. Rahul VC Tiwari, Fellow in Orthognathic Surgery, Department of Oral & Maxillofacial Surgery and Dentistry, Jubilee Mission Medical College Hospital and Research Institute, Thrissur, Kerala, India

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INTRODUCTION

Surgical endodontics is the branch of dentistry that is concerned with the diagnosis and treatment of lesions of endodontic origin that do not respond to conventional endodontic therapy or that cannot be treated by conventional endodontic therapy. Carious lesion with periapical pathology is managed with the endodontic therapy. The access opening, bio- mechanical preparation followed by obturation and restoration are steps of endodontic therapy or root canal treatment. There is no need of raising the surgical flap. Whenever, access is achieved via surgical flap, the procedure is known as surgical endodontics.¹

Success rates for contemporary endodontic therapy are in excess of 90%, depending on the skill of the clinician and the teeth involved. Surgical endodontic procedures are usually undertaken when conventional (orthograde) endodontics has failed. However, the chances of successful

re-treatment of a tooth with a failed root filling are higher when non-surgical endodontics is repeated rather than by undertaking a surgical approach. Surgical endodontics may therefore not be the first option when conventional root canal treatment fails.²

Options for the management of these failures can be non-surgical root canal retreatment or surgical endodontics. Non-surgical retreatment may provide a better opportunity to clean the pulp space than a surgical approach. However there are clinical situations when non-surgical root canal retreatment is inappropriate.³

A wide range of success rates for surgical endodontics has been reported (44–95%). Systematic reviews comparing the outcome of non-surgical root canal retreatment and surgical endodontics reveal that, to date, there have been only two randomised controlled trials. The data from this limited evidence suggests that although surgery may offer a more favourable outcome in

the short term, non-surgical retreatment offers a more favourable long-term outcome.⁴

Indications for surgical endodontics

Following are the indications of surgical endodontics-

1. Peri-radicular disease associated with a tooth where iatrogenic or developmental anomalies prevent non-surgical root canal treatment being undertaken.
2. Peri-radicular disease in a root-filled tooth where non-surgical root canal retreatment cannot be undertaken or has failed, or when it may be detrimental to the retention of the tooth.
3. Where a biopsy of peri-radicular tissue is required.
4. Where visualisation of the peri-radicular tissues and tooth root is required when perforation or root fracture is suspected.
5. Where it may not be expedient to undertake prolonged nonsurgical root canal retreatment because of patient considerations.⁵

Contraindications

Most contraindications are relative, and they are usually limited to three areas: the patient's medical status, anatomic considerations, and the dentist's skills and experience. Contraindications for endodontic surgery include the following-

1. The tooth has no function (no antagonist, no strategic importance serving as a pillar for a fixed prosthesis).
2. The tooth cannot be restored.
3. The tooth has inadequate periodontal support, or the tooth has a vertical root fracture.⁶ Additional general contraindications may be an uncooperative patient or a patient with a compromised medical history for an oral surgical intervention.

Advances in medicine have dramatically increased life expectancy and the survival rate from most of today's diseases. Dentists are, with increasing frequency, being asked to treat medically compromised patients. When considering performing any surgical procedure on a patient who reports a major systems disorder (cardiovascular, respiratory, digestive, hepatic, renal, immune, or skeletomuscular), a thorough medical history is mandatory. Following the identification of all potential medical complications and a review of the patient's current drug regimen, a consultation with the primary care physician or specialist may be in order.⁷

Categories of endodontic surgery

Following are the endodontic surgeries

- 1- Periapical surgery.
- 2- Hemisection/root amputation.
- 3- Intentional replantation.
- 4- Corrective surgery.

Periapical surgery

The success of apical surgery varies considerably, depending on the reason for and nature of the procedure. With failed root canal treatment, often retreatment is not possible or a better result cannot be achieved by a coronal approach.⁸

Indication for periapical surgery

1. When an unusual entity in the periapical region requires surgical removal and biopsy for identification
2. When the cause of root canal failure cannot be identified so surgical exploration may be necessary.⁹
3. Anatomic problems preventing complete debridement /obturation.
4. Restorative consideration that compromise treatment.
5. Horizontal root fractures with apical necrosis.
6. Irretrievable material preventing canal treatment or retreatment.
7. Procedural error during treatment.
8. Large periapical lesion that do not resolve with root canal treatment.¹⁰

Hemisection/root amputation

Root end resection is often, but not always, indicated. It is useful in two situations:

1. To gain access to the canal for examination and placement of a root end preparation and restoration.
2. To remove an undebrided or unobtured (or both) portion of a root.

This may be necessary in cases with dilacerated roots, ledged or blocked canals, or apical canal space that is inaccessible because of restorations, as well as in accessing of lingual structures.¹¹ Amputation may be vertical root amputation and horizontal root amputation. Remaining root prone to fracture due to occlusal forces of restoration not in line with long axis of the root, consider minor tooth movement to align root so occlusal forces are along long axis, do not restore as a cantilever.¹²

Intentional replantation

Sometimes, tooth which get exfoliated accidentally such as in case of trauma, endodontic surgery is performed and the tooth is intentionally replanted in the socket.¹³

Corrective surgery

Corrective surgery is managing defects that have occurred by a biologic response (i.e., resorption) or iatrogenic (i.e., procedural) error. These may be anywhere on the root, from cervical margin to apex. Many are accessible; others are difficult to reach or are in virtually inaccessible areas. A corrective procedure is necessary. Generally, the procedure involves exposing, preparing, then sealing the defect.¹⁴

CONCLUSION

Surgery is a very important aspect of endodontics. Endodontic surgery has now evolved into endodontic

microsurgery. With a high percentage of successful treatment outcomes of conventional endodontics together with high success of surgical endodontics almost all teeth with endodontic lesions can be successfully treated.

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