International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 7; Issue 10(F); October 2018; Page No.16083-16086
DOI: http://dx.doi.org/10.24327/ijcar.2018.16086.2954

Research Article

MICROVASCULAR SURGERY IN ENDODONTICS

Swadheena Patro[1]., Siba Prasad Jena[1] and Sumita Mishra[2]

[1]Dept. of Conservative Dentistry & AMP; Endodontics Institute of Dental Sciences Siksha O Anusandhan University Kalinga Nagar, Bhubaneswar-751003, Odisha, India
[2]Dept of Orthodontics Institute of Dental Sciences SOA Deemed to be University Bhubaneswar

A R T I C L E I N F O

Article History:

Received 10th July, 2018
Received in revised form 2nd August, 2018
Accepted 26th September, 2018
Published online 28th October, 2018

Key words:

Microvascular, Endodontics, latest trends

A B S T R A C T

Microsurgery is defined as a surgical procedure on exceptionally small and complex structures with an operation microscope. The microscope enables the surgeon to assess pathological changes more precisely and to remove pathological lesions with far greater precision, thus minimizing tissue damage during the surgery. This concurrent development of microscopic techniques has resulted in a new understanding of the apical anatomy, better surgical and apical resection techniques, better patient response, and greater treatment success. These developments have marked the beginning of the endodontic microsurgery era.

INTRODUCTION

The main aim of root canal therapy is to clean and disinfect the root canal system, thereby reducing the bacterial load, removing the necrotic tissue and creating an environment in which periapical healing can occur. Surgery might be indicated for teeth with persistent periradicular pathosis that have not responded to non surgical procedures. Over the past decade periradicular surgery has continued to evolve into a precise, biologically based adjunct to non surgical root canal therapy.[2] The scope of Endodontic surgery includes periapical curettage, radisectomy, replantation, transplantation, implantation, trephination, incision for drainage, and root submergence.

History

The first recorded endodontic surgical procedure was incision and drainage of an acute endodontic abscess performed by Aetius, a Greek physician over 1500 years ago. Since then, Endodontic surgery and Endodontic surgical procedures have been developed and refined by many pioneers in dentistry.[3]

Microsurgery

Microsurgery is defined as a surgical procedure with an operation microscope. The microscope enables the surgeon to assess pathological changes more precisely and to remove pathological lesions with far greater precision, thus minimizing tissue damage during the surgery. [4] The microscope enables the surgeon to assess pathological changes more precisely and to remove pathological lesions with far greater precision, thus minimizing tissue damage during the surgery. [5]

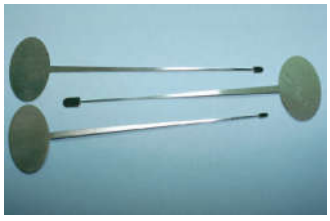
Corresponding author:* **Swadheena Patro
Dept. of Conservative Dentistry & Endodontics Institute of Dental Sciences Siksha O Anusandhan University Kalinga Nagar, Bhubaneswar-751003, Odisha, India

x 2.5 x3.5 dental loupes

Development of Microinstruments

The microscope has led to the development of special instruments with revolutionary designs and functions. Ultrasonic tips for retrograde preparations enable the surgeon to prepare clean canals with the correct axial alignment to a depth of 3 mm. Micromirrors allow the inspection of the resected root surface for anatomical details. Special micropluggers have been designed to permit more compact retrograde fillings.

Microsurgical Armamentatrium

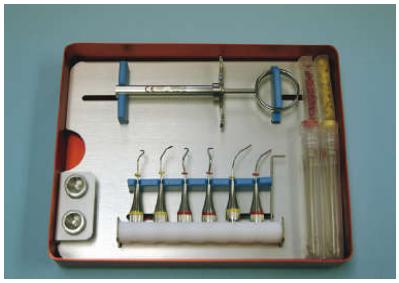


Zinni ENT micromirrors

A variety of micro scalpels sized 1-5 used for precise incision

Blade and contact surfaces of the Rubinstein Retractors 1-6

Comparison of the small ends of two mini-Molts and a standard Molt 2-4 curette



Micro apical placement system

Comparison between micro and macro pluggers

The Endodontic Microsurgical Triad

Classification of Endodontic Microsurgery

Classification is based on assessment root form osseointegrated implants treatment outcome

- Class A - Absence of periapical lesion, but resolution symptoms after non surgical approaches have been exhausted.
- Class B - Presence of a small periapical lesion and no periodontal pockets.
- Class C - Presence of a large periapical lesions progressing coronally but without periodontal pocket.
- Class D - Clinical picture similar to Class C with a periodontal pocket.
- Class E - Periapical lesion with an endodontic and periodontal communication but no root fracture.
- Class F – Tooth with an apical lesion and complete denudement of the buccal plate

Ingle has classified Endodontic surgical procedures as

1. Surgical drainage

a. Incision and drainage (I & D)
b. Cortical trephination (fistulative surgery)

2. Periradicular surgery

a. Curettage
b. Biopsy
c. Root-end resection
d. Root-end preparation and filling

3. Corrective surgery

a. Perforation repair
b. Mechanical (iatrogenic).
c. Resorptive (internal and external)
d. Root resection
e. Hemisection

1. Replacement surgery (extraction/replantation)
2. Implant surgery

a. Endodontic implants
b. Root-form osseo integrated implants

Stockdale broadly classified Endodontic surgerical procedures in to

1. Apical resection with retro-sealing of a root filled tooth.
2. Immediate orthograde root filling with retro-sealing.
3. Sealing of accessible root perforations.
4. Apical curettage.
5. Decompression of large periapical areas prior to 1 to 3 above.
6. Endodontic stabilizers or diadontic implants.

Indications of Endodontic surgery

Traditionally, the rationale for surgical Endodontic treatment of a tooth was to attain bacteria-tight seal of the root canal by means of a filling placed in a retrograde fashion in the root canal.

Primary surgical treatment of tooth with periapical lesion is taken up as the last resort in certain teeth where obliteration of the root canal makes it impossible to negotiate the canal.[9]

Contraindications for Endodontic Surgery

Few absolute contraindications to Endodontic surgery exist. Most contraindications are relative, and they are usually limited to three areas.

- Patient's medical status.
- Anatomic considerations.
- Dentist's skill and experience.
- General considerations.
- Medically compromised patient - uncontrolled diabetes, tuberculosis, syphilis etc.

Prophylactic Regimen for Oral, Dental Procedures for High Risk Patients (American Heart Association AHA 1997)

1. Standard Regimen: Amoxicillin:

- Adults: 2g orally,1 hour priorly
- Children:50mg/kg, 1 hour priorly

2. If patient cannot take orally:

- Adults: 2g im or iv
- Children:50mg/kg, 30 mins priorly

3. Allergy to penicillin:

Clindamycin

- Adults: 600mg, 1 hour priorly
- Children:20mg/kg, 1 hour priorly

Cephalexin or Cephadroxil:

- Adults: 2g
- Children:50mg/kg, 1 hour priorly

Azithromycin or Clarithromycin:

- Adults: 500mg
- Children:15mg/kg, 1 hour priorly

4. If cannot take orally: Ampicillin:

- Adults: 2g im or iv, 30 min priorly followed by 1g im or iv after 6 hours.
- Children:50mg/kg im or iv, 30 mins priorly followed by 25 mg im or iv after 6 hours

5. Patients allergic to Amoxicillin, Ampicillin and Pencillin:

Clindamycin:

- Adults: 300mg,iv 30 mins priorlyfollowed by150 mg iv after 6 hours
- Children:10mg/kg, 1 hour priorly

6. For high risk patients: Ampicillin, Gentamycin and Amoxicillin

- Adults: Ampicillin 2g + Gentamycin1.5 mg/kg im or iv 30 min priorly followed by Amoxicillin1.5g orally after 6 hours
- Children: Ampicillin 50mg/kg + Gentamycin 2 mg/kg and then half the initial dose after 6 hours.

7. Allergy to Ampicillin, Gentamycin and Amoxicillin: Vancomycin

- Adults: 1g iv, I hour priorly
- Children:20mg/kg im or iv and then half the initial dose after 6 hours

Preoperative medications

- Anti inflammatory agents: Ibuprofen 800 mg immediately before surgery and continue for 48 hours
- Tranquilizers: Valium 5 mg
- Antibiotics: Amoxicillin 500 mg, QID X 1 week
  Erythromycin 500 mg, QID X 1week
  Clindamycin 300 mg, QID X 1week
- Antibacterial rinses: Chlorhexidine gluconate 0.12%; previous night, in the morning, 30 minutes before surgery and continue for 1 week. (Gutmann and Harrison)

The various procedures include

1. Curretage
2. Root resection
3. Retrograde techniques[6]
4. Barrier Membrane techniques
5. Replantation
6. Root amputation / Resection
7. Hemisection
8. Bisection or Bicuspidization
9. Implant

CONCLUSION

The view that endodontic surgery is the last resort is based on past experience with unsuitable surgical instruments, inadequate vision within the surgical site, postoperative complications and failures that often lead to extraction of the tooth. Fortunately, this era has ended with the introduction of miniaturized surgical instruments, ultrasonics and the microscope to accommodate the small scale needs of endodontic surgery. This concurrent development of microscopic techniques has resulted in a new understanding of the apical anatomy, better surgical and apical resection techniques, better patient response, and greater treatment success. These developments have marked the beginning of the endodontic microsurgery era.

Bibliography

1. Carr GB: Surgical Endodontics In: Cohen S, Burns RC, editors: Pathways of the Pulp. 6th Edition, St. Louis, Mosby. 1998; 531-567.
2. Carr GB: Surgical Endodontics In: Cohen S, Burns RC, editors: Pathways of the Pulp. 8th Edition, St. Louis, Mosby. 2002; 786-810.
3. Guttman JL, Harrison JW. Surgical Endodontics. Medico Dental Media International, Saint Louis, Mosby. 1994.

4. Taylor JA. History of Dentistry: A Practical Treatise for the Use of Dental Students and Practitioners. 5th Edition, BiblioBaazar. 2015; 145-166.
5. Barnes IE. Surgical Endodontics, A Colour Manual. 1st Edition, MTP Press Limited. 1984; 35-97.
6. Torabinejad M, Hong CU, McDonald F, Pitt Ford T. Physical and chemical properties of a new root-end filling material. *J Endod*. 1995; 21:349.

How to cite this article:

Swadheena Patro (2018) ' Microvascular Surgery in Endodontics', *International Journal of Current Advanced Research,* 07(10), pp. 16083-16086. DOI: http://dx.doi.org/10.24327/ijcar.2018.16086.2954

****