

Abstracts

Adriaens, P.A. & de Boever, J. (1978) *Revue Belge de Medecine Dentaire*, 33, 213–234
Diagnosis and treatment of furcation-involved teeth

The furcation stage of periodontal breakdown of multirrooted teeth can be accelerated by endodontic complications and occlusal trauma. Clinical and radiographic diagnoses are valuable but in many cases the extent of the lesion can be determined only by surgical exploration.

The treatment of a first-degree lesion (maximum 3 mm horizontal bone loss) consists in removing all the inflammatory tissue. Osteo- and odontoplasty will restore physiological contours to allow optimal hygiene.

A second-degree lesion includes infra-bony pockets. The first step in treatment consists of thoroughly curetting all the inflammatory tissue. Minor osseous defects can be corrected by an osteoplasty procedure, while more advanced lesions can be filled with grafting material.

A third-degree lesion includes a 'see-through' defect of the furcation. Treatment may consist of widening the 'see-through' lesion to create a more cleansable tunnel. However, this procedure is now less widely used because of root caries. Alternatively the tooth may be divided, premolarization, in which the inter-radicular area is transformed into an interdental area. A third choice consists of dividing the tooth and extracting the worst affected part. Vertical amputation is favoured to horizontal amputation as it allows better cleaning.

The prognosis depends in part on the correct diagnosis and treatment but the patient's oral hygiene will be decisive. With these procedures and the co-operation of a motivated patient it becomes possible to treat multirrooted teeth with furcation involvement thus conserving them for many years.

35 references

Author's abstract

Detsch, S.G., Cunningham, W.T. & Langloss, J.M. (1979) *Journal of Endodontics*, 5, 60–62

Endoscopy as an aid to endodontic diagnosis

The authors describe the use of a paediatric cystoscope to examine the interior of a root canal.

They report a case in which a maxillary central incisor developed a purulent discharge from the gingival sulcus following endodontic treatment. The palatal surface of the tooth showed a crack which they suspected extended subgingivally,

causing the continuing infection. Both a paediatric cystoscope and a laryngoscope were used to view directly inside the canal and the crack could be seen to extend not further than a few mm subgingivally, hence permitting conservative treatment to be carried out.

The use of a cystoscope with a diameter of 1.7 mm and a rigid structure limits its use to straight canals or coronal abnormalities. It cannot provide observation of the external surface.

4 references

Lesley M. L. Price

Goldberg, F., Gurfinkel, J. & Spielberg, C. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 275–276

Microscopic study of standardized gutta-percha points

Eleven brands of standardized gutta-percha points were examined with an optical microscope. All brands displayed various depressions and protruberances which would not allow correct apical adaptation. The authors advocate development of precision manufacturing techniques as well as softening of the gutta-percha by heat or solvents to improve the apical seal.

6 references

J. E. Reuter

Goldman, L.B., Goldman, M., Kronman, J.H. & Lin, P.S. (1979) Scanning electron microscopy study of a new irrigation method in endodontic treatment. *Oral Surgery, Oral Medicine and Oral Pathology*, 48, 79–83

Scanning electron microscopy study of a new irrigation method in endodontic treatment

The scanning electron microscope was used to study the debris left in the root canal after preparation and irrigation with 5.25 per cent sodium hypochlorite. The investigators found that a perforated needle with a sealed distal aperture left a cleaner canal than a conventional 23-gauge needle, both in terms of soft tissue debris and dentine chips. However, all groups studied exhibited a 'smeared layer'.

8 references

D. J. Eldridge

Harrison, J.W., Bellizzi, R. & Osetek, E.M. (1979) *Journal of Endodontics*, 5, 42–47

The clinical toxicity of endodontic medicaments

Whilst accepting the importance of mechanical cleansing of the root canal, the authors suggest that intracanal medicaments have a valuable role to play in root canal treatment. This study sets out to assess clinically the toxicity of two such preparations by evaluating the incidence and degree of inter-appointment pain.

One hundred and ninety-one patients who had symptomless teeth after endodontic treatment each had either formocresol, camphorated para-chlorophenol, or sterile water on cotton wool sealed in the pulp chamber of the teeth at the end of the first visit.

At follow-up, 82.2 per cent had been free of pain, 13.6 per cent had had slight discomfort, and 4.2 per cent had required treatment with analgesics. Statistical analysis showed no significant difference in pain between the two test medicaments and the control, and no difference between teeth which had been vital initially and those which had been non-vital. Multirooted teeth had a significantly higher incidence of inter-appointment pain than single-rooted teeth.

33 references

N. E. Carter

Kemp, W.B., Calhoun, R.L. & Andrews, C.H. (1979) *Journal of Endodontics*, 5, 154–157
Subcrestal retention of endodontically treated roots: a discussion and report of case

This paper describes intentional subcrestal retention of three endodontically treated roots in two patients. They were both teenage boys with fractured incisors due to trauma but with otherwise good periodontal health.

The intention was to and promote formation of supradicular bone over the submerged roots which might discourage the coronal migration of the root. After the surgical procedure both patients wore a transitional partial denture with a view to replacement by a fixed bridge at a later date.

The roots were resected 2–4 mm below the level of the crestal bone and root-filled to reduce the possibility of pulpitis. After 12 months there was some evidence of coronal bone formation. However, the question of the value of retention of roots under a fixed bridge remains unanswered.

The authors note that although the case reports illustrate techniques and observe clinical findings they are of limited scientific value unless a large number of patients are studied with control over other variables.

7 references

E. M. Hardie

Kerekes, K. (1979) *Journal of Endodontics*, 5, 145–150

Evaluation of standardized root canal instruments and obturating points

The International Organisation for Standardization, in an attempt to standardize endodontic instruments and obturating points, suggested that manufacturers should conform to specific dimensions. This paper examines the degree of accuracy achieved by current manufacturers in relation to the diameter, taper and length of selected reamers, files and points.

In view of the extreme accuracy of the apparatus employed most instruments conformed reliably although gutta-percha points demonstrated erratic results.

In the ideal belief that mechanical preparation can render a canal circular in its apical third the author encourages greater manufacturing accuracy with gutta-percha to facilitate safer endodontic techniques.

19 references

D. W. Davidson

Maerki, H.S., Huget, E.F., Vermilyea, S.G. & de Simon, L.B. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 479–481

Stress relaxation of interim restorations

This paper reports the results of a study of stress relaxation of four temporary filling materials: zinc oxide-eugenol cement, a resin reinforced zinc oxide-eugenol cement, Cavit and gutta-percha. These materials were tested at various temperatures on a constant strain-rate machine.

The authors concluded that, at mouth temperatures, the relaxation characteristics of zinc oxide-eugenol cement were more favourable (i.e. relaxed less) than both the modified cement and Cavit. The thermoplastic behaviour of gutta-percha precluded its assessment above 22°C.

6 references

B. J. Smith

Malooley, J., Patterson, S.S. & Kafrawy, A. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 545–554

Response of periapical pathosis to endodontic treatment in monkeys

This study investigated histologically the periapical tissue response to root fillings in four macaque monkeys.

The root canals of thirty-seven teeth were opened and contaminated with saliva for 1 week before the access cavities were closed. After a period varying from 30 to 90 days the canals were

prepared and filled except for four which were left as controls. The treated canals were irrigated with 4 per cent chloramine T solution during preparation, and camphorated monochlorophenol was used as a medicament between visits. The canals were filled with laterally condensed gutta-percha and 'Tubli-seal' after a negative culture had been obtained. The treated teeth were left for time intervals varying between 15 days and 1 year before the animals were killed. The jaws were prepared for histological examination. Sections were stained with haematoxylin and eosin or the Brown and Brenn stain, or left unstained to examine for Procion Red dye which had been injected into the animals while they were alive.

Of thirty-three root-filled teeth only one had a discharging sinus whereas three of the four infected control teeth had sinuses. Abscesses were found around the apices of all the control teeth, every root of which contained micro-organisms. Of the thirty-seven treated canals micro-organisms were found in fifteen, despite negative cultures being obtained. Inflammation was found around the apices of nineteen canals, while a further fourteen were considered to be healing, although inflammatory cells were present. Micro-organisms were often found in canal debris and the tissue reaction around these teeth was more severe. No micro-organisms were found in the periapical tissues around any treated tooth.

The examination of radiographs showed that of twenty-five periapical areas which had decreased in size after treatment, eleven were regarded histologically as granulomas or more severe lesions. There was poor correlation between the radiographic diagnosis and the histological condition.

10 references

T. Pitt Ford

Matusow, R.J. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 48, 70–76

Acute pulp-alveolar cellulitis syndrome. I. Clinical study of bacterial isolates from pulps and exudates of intact teeth, with description of a specific culture technique

This study involved the bacteriological investigation of pulps from seventy-six intact teeth associated with acute cellulitis. Organisms were cultured both aerobically and anaerobically. Streptococci were isolated most commonly (62 per cent of total microbes). Forty per cent of the streptococci were α -haemolytic. Anaerobes constituted 32 per cent of total organisms. A wide variety of organisms was found. Aerobes were usually found in pure culture whereas anaerobes were mixed.

21 references

M. P. Bennetts

Meyer, F.W. & Sayegh, F.S. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 267–274

Wound healing following curettage of bifurcation abscesses of human primary molars

Pulpal necrosis in primary molars frequently leads to abscess formation at the bifurcation of the roots and a discharging sinus. Forty-five such mandibular teeth were radiographed and treated by formocresol pulpotomy. At the first appointment a biopsy was taken of the overlying buccal tissues, followed by curettage of the abscessed area.

Seven days later the pulp chambers were filled with zinc oxide cement. Healing was uneventful and resulted in closure of the fistulae.

The cases were observed over a period of up to 5 years and assessed with periapical radiographs and punch biopsies.

With the elimination or arrest of rarefaction of the original lesions, 87 per cent of these treatments were considered successful. The punch biopsies of the healing tissues showed an early proliferation of fibroblasts, the formation of a collagen network and deposition of new bone.

41 references

Alan A. Robinson

Okada, T., Ito, A. & Asai, Y. (1979) *Bulletin of Tokyo Dental College*, 20, 61–82

Clinico-pathological studies of the effects of various kinds of calcium hydroxide compounds as indirect pulp capping agents on human vital pulp tissues

This study investigated the effect of calcium hydroxide compounds as indirect pulp capping agents on 100 healthy human permanent teeth, which were divided into four groups and treated according to the following methods. An occlusal cavity was prepared in each tooth, and then the floor of each cavity was covered with a thin layer of one of the following materials: Group 1 – Dycal, Group 2 – MPC, Group 3 – pure calcium hydroxide mixed with sterile water, and Group 4 – gutta-percha temporary stopping as a control. The teeth were extracted at various time intervals up to 560 days after treatment, and prepared for histological examination.

This study showed both Dycal and MPC to be clinically valuable when used as indirect pulp capping agents on vital human pulp tissues.

15 references

Authors' abstract

Palmer, G.R., Weine, F.S., Palmer, M.T. & Healey, H.J. (1979) *Journal of Endodontics*, 5, 116–120

A study of the tissue reaction to silver cones and Ti-6Al-4V in the rhesus monkey

This paper describes the tissue reaction to root filling cones made from either silver or an alloy of titanium, aluminium and vanadium in rhesus monkeys.

Twenty-four root canals were prepared in two monkeys and the root filling cones were placed through the apices with Proco-Sol cement as a sealer. After 155 days the animals were killed and the tissues prepared for histological examination. Sections were stained with haematoxylin and eosin.

The tissue reaction was classified on a scale 1 to 4 as the severity increased. The average grade of response of the tissues to the silver cones was 3.33 whereas that to the titanium alloy was milder, 1.75. No tooth in the silver cone group showed a grade 1 reaction whereas five showed a grade 4 response. In the titanium alloy group four showed grade 1 reaction but none showed a grade 4 response. Gross examination of the silver cones which were removed from the teeth prior to histological preparation showed surface corrosion.

The authors concluded that the tissue reaction around the silver cones was more severe but considered that the root canal cement may have had some influence. They recommended further evaluation of the titanium alloy in view of its more favourable tissue response.

17 references

F. J. Thomas

Paquette, O.E. & Del Rio, C.E. (1979) *Journal of Endodontics*, 5, 158–159

Modified film holder for endodontics

This short note recognizes the problem of positioning a film holder in the mouth when rubber dam has been placed. A simple modification of a commercially obtainable film holder which overcomes the difficulty is described.

No references

I. A. Nelson

Ram, Z. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 48, 84–86.

Endodontic–periodontic interrelationships

The author briefly discusses the interrelationship between pulp and periodontal lesions and divides them into five categories according to aetiology. The five categories are 1 pulp lesions, 2 primary pulp lesion with secondary periodontal lesion, 3

periodontal lesion, 4 periodontal lesion with secondary pulp lesion and 5 true combined lesion.

A case history is given to illustrate the second category.

9 references

R. K. Webster

Thé S.D. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 555–557.

Sectional gutta-percha point, second apical seal, and coating of the inner dentine walls

The author states that coating a gutta-percha point and inserting it into position is unlikely to produce a satisfactory seal at the apex, whereas introducing a sealer before the gutta-percha point may result in the sealer being forced into the periapical tissues. The author then describes his method of achieving a satisfactory seal by the use of a section of gutta-percha as well as a root canal sealer.

No references

T. J. Bereznicki

Thé S.D. (1979) *Oral Surgery, Oral Medicine and Oral Pathology*, 47, 558–561.

The solvent action of sodium hypochlorite on fixed and unfixed necrotic tissue

Connective tissue from the abdominal wall of rats was used as a source of fixed and unfixed necrotic material for testing the tissue-dissolving effect of varying concentrations of sodium hypochlorite and hydrogen peroxide.

When unfixed necrotic tissue was exposed to 5 ml of a 3 per cent sodium hypochlorite solution for 30 minutes only 5 per cent of the tissue sample remained. This volume was estimated using a naked-eye comparison with an untreated tissue sample. Using 5 ml of a 1 per cent sodium hypochlorite solution (Milton's solution) 60 per cent of the tissue sample remained after 30 minutes.

The greater the volume of sodium hypochlorite used (0.5 to 5.0 ml maximum), the greater the amount of tissue that was dissolved.

Nine days-fixed necrotic tissue was much more resistant to solvent treatment although the tissue treated with parachlorophenol was slightly more soluble than that treated with formaldehyde.

Three per cent hydrogen peroxide, regardless of whether it was used alternately or together with the sodium hypochlorite, significantly diminished the solvent action of the sodium hypochlorite.

The author advised a specific technique for preparing a stable sodium hypochlorite solution with an optimal pH of 12.

4 references

Elaine Giedrys

Tidmarsh, B.G. (1979) *Journal of Oral Rehabilitation*, 6, 235–240

Accidental perforation of the roots of teeth

The causes, prevention and treatment of various types of accidental perforation are discussed. They can be divided into three groups, apical, mid-root and subgingival regions.

Perforations in the apical region usually occur with the use of large instruments in curved canals. These can be avoided by pre-bending the instruments, use of chelating agents and minimal quarter-turn rotational movements. The perforation can be sealed with gutta-percha and sealer while the original canal may be filled with sealer. If irritation continues surgery may be necessary and amalgam used to seal the defects. The author does not consider apical resection is necessary in most cases. Calcium hydroxide can be used to promote formation of mineralized tissue in cases where the root-end has split, usually due to thin dentine walls.

Mid-root perforations usually occur during post preparation. The defect can be sealed with difficulty by gutta-percha and sealer or by condensing calcium hydroxide against the periodontal ligament. Alternatively, oxidized cellulose can be packed into the perforation, followed by an amalgam seal from the coronal aspect.

Subgingival perforations usually occur in molars, lingually, buccally or most often in the furcation area. These can be avoided by care in assessing tooth angulation and depth of the pulp chamber. Perforations are best repaired by application of calcium hydroxide and a cement base. External buccal or lingual perforations may be sealed with amalgam, while more difficult perforations, particularly interdentally, may require hemisection and removal of the affected root.

3 references

C. Invest

Tilk, M.A., Lommel, T.J. & Gerstein, H. (1980) *Journal of Endodontics*, 5, 79–82

A study of mandibular and maxillary root widths to determine dowel size

Knowledge of root width is crucial in the preparation of the post hole for restoration of root-filled

teeth. In this study, the narrowest mesiodistal width of the cervical, middle and apical thirds of 125 extracted teeth of each unit of the permanent dentition was measured. On the basis of these measurements, the optimum size is given for a pre-formed post for use in each tooth.

For maxillary teeth, a size 110 post is suggested for the central incisor, a size 100 for the canine and palatal root of the first molar and a size 90 for the lateral incisor and first premolar.

For mandibular teeth, a size 70 post is suggested for the incisors, a size 90 for premolars and distal roots of first molars, and a size 100 for the canine.

9 references

Julian Webber

Yakushiji, M., Kinumatsu, T., Fuchino, T. & Machida, Y. (1979) *Bulletin of Tokyo Dental College*, 20, 47–59

Effects of glass ionomer cement on the dental pulp and its efficacy as a base material

This investigation was undertaken to determine the influence of glass ionomer cement alone upon young permanent human teeth, and its protective effect against undesirable irritation caused by filling materials. Class V cavities were prepared in twenty permanent teeth, and glass ionomer cement was applied to each of the cavities. After this, ten teeth were filled with amalgam while the other ten were filled with composite resin. The experimental teeth were observed clinically, extracted after various time intervals and examined histologically.

None of the teeth showed any clinical discomfort but various degrees of pathological pulpal response were found in all specimens. These responses were mild and similar to those caused by cavity preparation.

15 references

Author's abstract

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