

ENDO TRIBUNE

Canals



Canal anatomy
Siju Jacob says that if you don't recognise and treat aberrant canal anatomy, it can affect the prognosis of endodontic therapy.
▶ pages 11-12

Treatment



Different perspectives
Whether root canal treatment can be successful after just one or multiple sessions is a common topic of discussion.
▶ pages 13

Evaluation



Learning curve
Clearing the teeth is a valuable process that allows us to evaluate endodontic failures. Dr Barrington and Dr Willis explain why.
▶ pages 14-15

Products



Useful website
Professor Liviu Steier looks at a new website which aims to simplify the process of choosing products and materials.
▶ pages 18

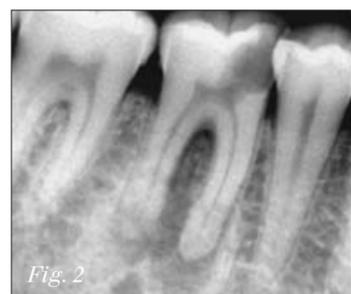
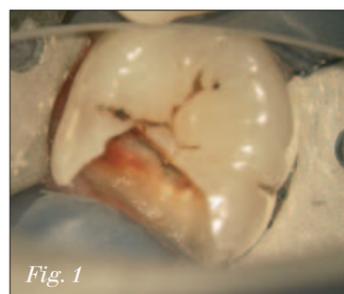
Clinical skills



Following up
Dr Barrington suggests that although treatment failure is unfavourable, it's a chance to improve our skills.
▶ pages 20-21

Case report: Middle mesial canal

Siju Jacob shows why it pays to be aware of the possibility of a third mesial canal when treating mandibular molars



Abstract

Failure to recognise and treat aberrant canal anatomy can affect the prognosis of endodontic therapy. This case report shows a variation in conventional anatomy in mandibular first molars. A third mesial canal may be present between the Mesio-lingual and Mesio-buccal canal in Mandibular molars. A clinician should be aware of the possibility of this extra anatomy when treating mandibular molars.

variations is essential to ensure consistency in endodontic therapy. Variations from conventional anatomy are encountered occasionally in all teeth. Inability to recognise, detect and treat this additional anatomy can lead to failure of endodontic therapy¹.

In mandibular first molars, the normal anatomical pattern consists of two mesial canals and one or two distal canals². However, a third mesial canal may be occasionally present between the mesio-buccal and the

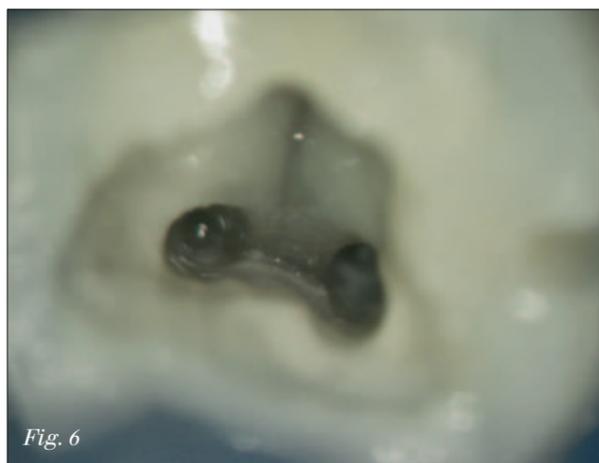
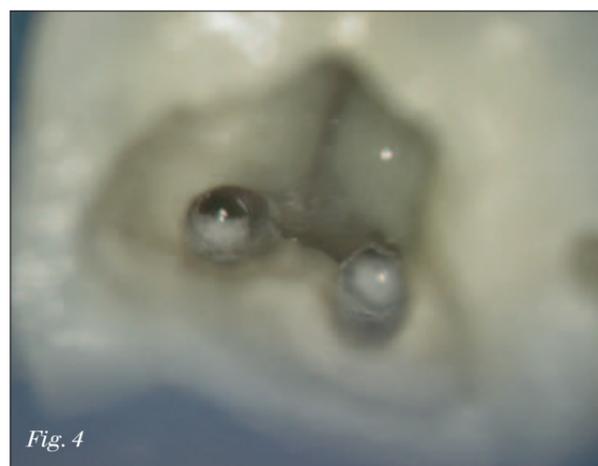
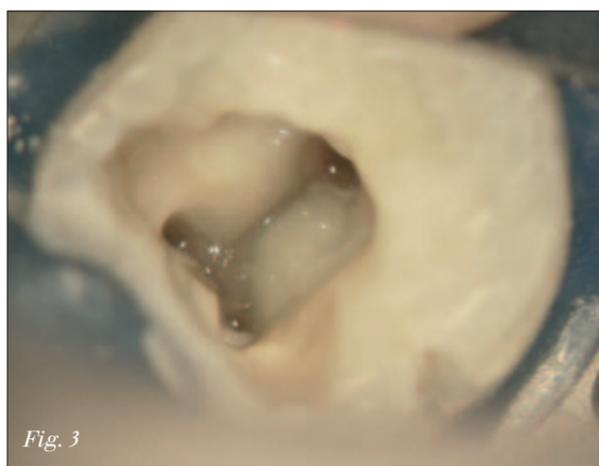
Introduction

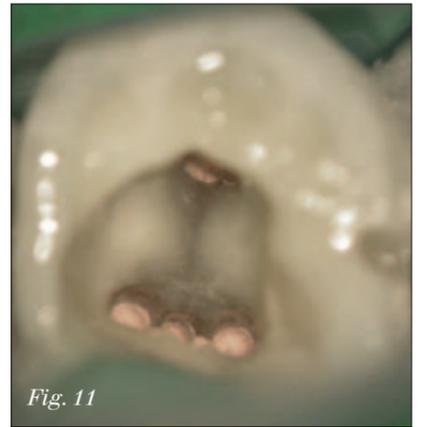
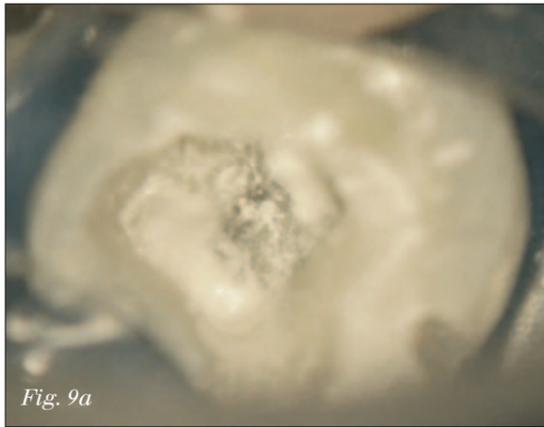
A comprehensive knowledge of canal anatomy and its

→ **ET** page 12

Authors	Year	No. of teeth	Method	Three Canals (%)
Skidmore and Bjorndol	1971	45	Vitro	0
Pineda and Kuttler	1972	300	Vitro	0
Vertucci	1974	100	Vitro	1
Pomeranz	1981	100	Vivo	12
Martinez-Berna and Badanelli	1985	1418	Vivo	1.5
Fabra-Campos	1985	145	Vivo	2.1
Fabra-Campos	1989	760	Vivo	2.6
Goel	1991	60	Vivo	15

Table 1: Prevalence of a third canal in the mesial root of Mandibular Molars according to different authors. (Courtesy Navarro et al)





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mesio-lingual canal. This is referred to as the middle mesial canal. The middle mesial canal maybe confluent or may have a separate portal of exit. The incidence of middle mesial canals varies from 1 to 15 per cent 3. (See Table. 1).

This article will illustrate the clinical management of the middle mesial canal.

lar (see Fig. 2). A diagnosis of chronic apical periodontitis was made. Treatment options were discussed with the patient and Endodontic therapy was the treatment of choice.

After local anesthesia and rubber dam application, an access cavity was prepared. Initial access revealed two mesial canals and one distal canal (see Fig. 3). On closer examination with a surgical microscope (Zeiss Germany)

cal canal. Canals were irrigated with 5.2 per cent sodium hypochlorite, 17 per cent EDTA and two per cent Chlorhexidine. Canals were dried using paper points and a calcium hydroxide paste (Apexcal, Ivoclar Vivadent, Switzerland) was placed in the canals (see Figs. 9 a and 9b). The access cavity was sealed with a layer of Cavit (3M ESPE, Germany) followed by glass ionomer cement (Fuji VII, GC, Japan).

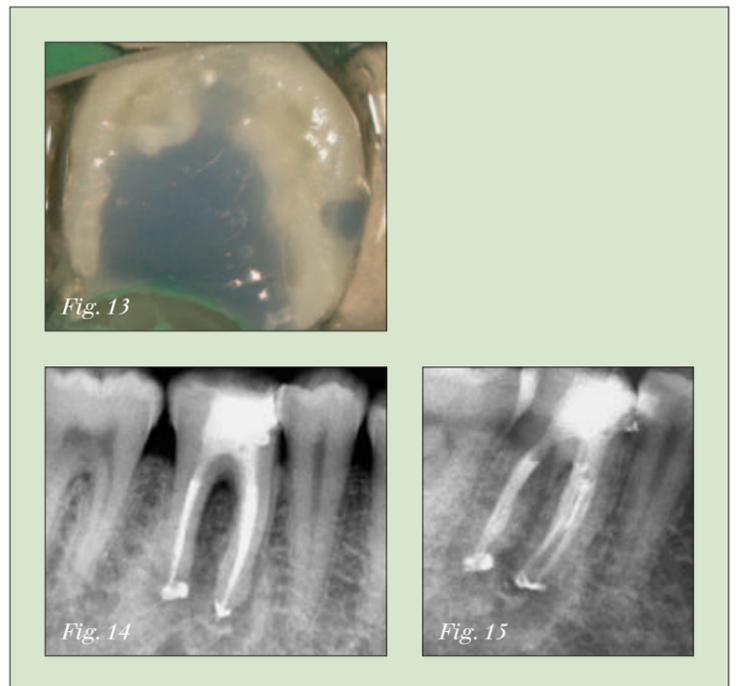
The patient was recalled two weeks later. The calcium hydroxide was removed (see Fig. 10). The canals were obturated using gutta percha and AH plus sealer (Dentsply De-Trey, Germany) in warm vertical condensation. The access cavity was sealed and the core buildup done using a dual cured resin (Luxacore, DMG, Germany) (see Figs. 11 to 15).

Discussion

The biologic objectives of endodontic therapy include removal of all potential irritants from the root canal space and the control of infection and periapical inflammation. Complex root canal anatomy can prevent achievement of endodontic goals. It is important to debride, disinfect and obturate as much anatomy as possible. A missed canal can lead to failure of Endodontic therapy 1. Therefore every effort must be made to locate additional canals if any.

An extra mesial canal known as the middle-mesial canal has been documented by numerous researchers⁵⁻⁹. The percentage varies from one to 15 per cent. The majority of middle mesial canals will merge with either the mesio-buccal or mesio-lingual canals. Rarely, they may have a separate apical portal of exit.

Numerous techniques enable the clinician to look for the middle mesial canal. It is im-



portant to have an adequately flared access cavity to visualise the anatomy of the chamber. Constricted access can lead to missed anatomy¹⁰.

The use of the surgical operating microscope has vastly enhanced the quality of Endodontic therapy^{11,12}. Magnification coupled with coaxial lighting greatly enhances visualisation and the potential to discover additional anatomy.

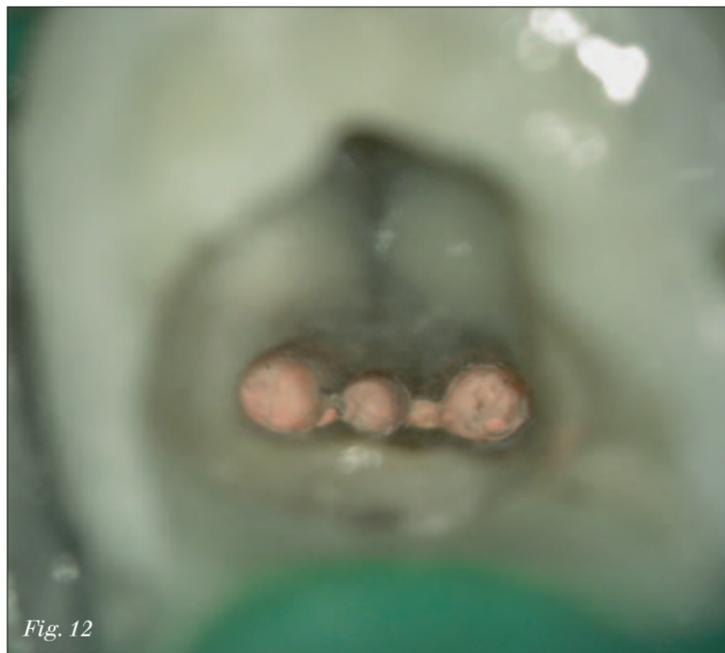
The use of ultrasonic tips for precise cutting has gained favour among clinicians in the last decade. Ultrasonics in conjunction with the surgical microscope (Microsonics) greatly enhances the clinician's ability to locate extra canals¹⁵.

Conclusion

Variations in conventional root canal anatomy can occur in any teeth. The middle mesial canal in Mandibular molars is one such variation. Knowledge of anatomical variations and the techniques to discover and manage these variations will significantly

enhance the prognosis of endodontic therapy.

References available on request. **ET**



Case report

A 27-year-old male patient reported to the clinic with chief complaint of food impaction in the right mandibular posterior tooth for the past four months. There was no history of pain. His past medical history was non-contributory.

Clinical examination revealed a large carious lesion in the right mandibular first molar tooth (see Fig. 1). The tooth was not tender to percussion and probing depths were within normal limits. Radiographic examination revealed a large radiolucent lesion in relation to the first mo-

a ledge of dentin was found between the mesio- buccal and mesio-lingual canals (see Fig. 4). The ledge was removed using ultrasonics (Proultra, Maillefer, Switzerland) (see Fig. 5). Removal of the dentinal shelf revealed an isthmus (see Fig. 6). Troughing of this isthmus with ultrasonics under magnification revealed a middle mesial canal (see Fig. 7).

All canals were cleaned and shaped (see Fig. 8) using Pro-taper (Dentsply Maillefer, Switzerland) and hand files. The Middle mesial canal was confluent with the Mesio buc-

About the author



Dr Siju Jacob BDS MDS maintains a private practice limited to Endodontics in Bangalore, India. In addition, he conducts hands-on courses in Endodontics and Microscopes for general practitioners and Endodontists at his center at Bangalore. He can be reached at drsiju@gmail.com or through his website, www.root-canalclinic.com.

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