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Case Report

Management of a maxillary first molar with morphological aberration using spiral computed tomography



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This case report presents treatment of a maxillary first molar with an unusual morphology of only two roots and two canals unilaterally with the use of Spiral CT as a diagnostic tool.

Case report

A 33-year-old female patient with non contributory medical history was referred for endodontic treatment of maxillary right first molar (Tooth No. 16) by general practitioner. The clinical and radiographic examination revealed an endodontic access cavity prepared in 16 with temporary restoration (Fig. 1a).

Local anaesthesia containing 2% lidocaine with 1:80,000 adrenaline (Lignox 2% ADR, Warren, India) was administered and the tooth was isolated with rubber dam (Hygienic, Coltène Whaledent Inc, USA). Temporary access cavity material was removed and the endodontic access opening was redefined with cavity access set (Dentsply Maillefer, Ballaigues, Switzerland). Examination of the floor of the pulp chamber revealed a peculiar pattern of the dentinal map suggestive of only two root canal orifices, a buccal and palatal (Fig. 1b). No other orifice was found, even by exploration under the dental operating microscope (Seiler Revelation[®], Seiler Instruments, St Louis, Missouri, USA) under $\times 8$ magnification. Though IOPA findings were suggestive of two canals, it was unable to rule out the absence of third canal.

Introduction

Recognition of root canal morphology and its possible variations is essential for successful endodontic therapy and to obviate endodontic failures caused by iatrogenic mishaps.^{1,2} An intricate literature search indicate that maxillary first molars have a wide range of variations with respect to the number of roots and the canals in-situ.^{3–5} Intraoral periapical radiographs (IOPA), though a cardinal diagnostic tool for assessing the canal configuration, is inexact with its inherent limitations. Contemporary diagnostic methods such as cone beam computed tomography (CBCT) and computed tomography (CT) have emerged as a cogent tool for evaluation of root canal morphology and fill the diagnostic voids of an IOPA.^{2,6}

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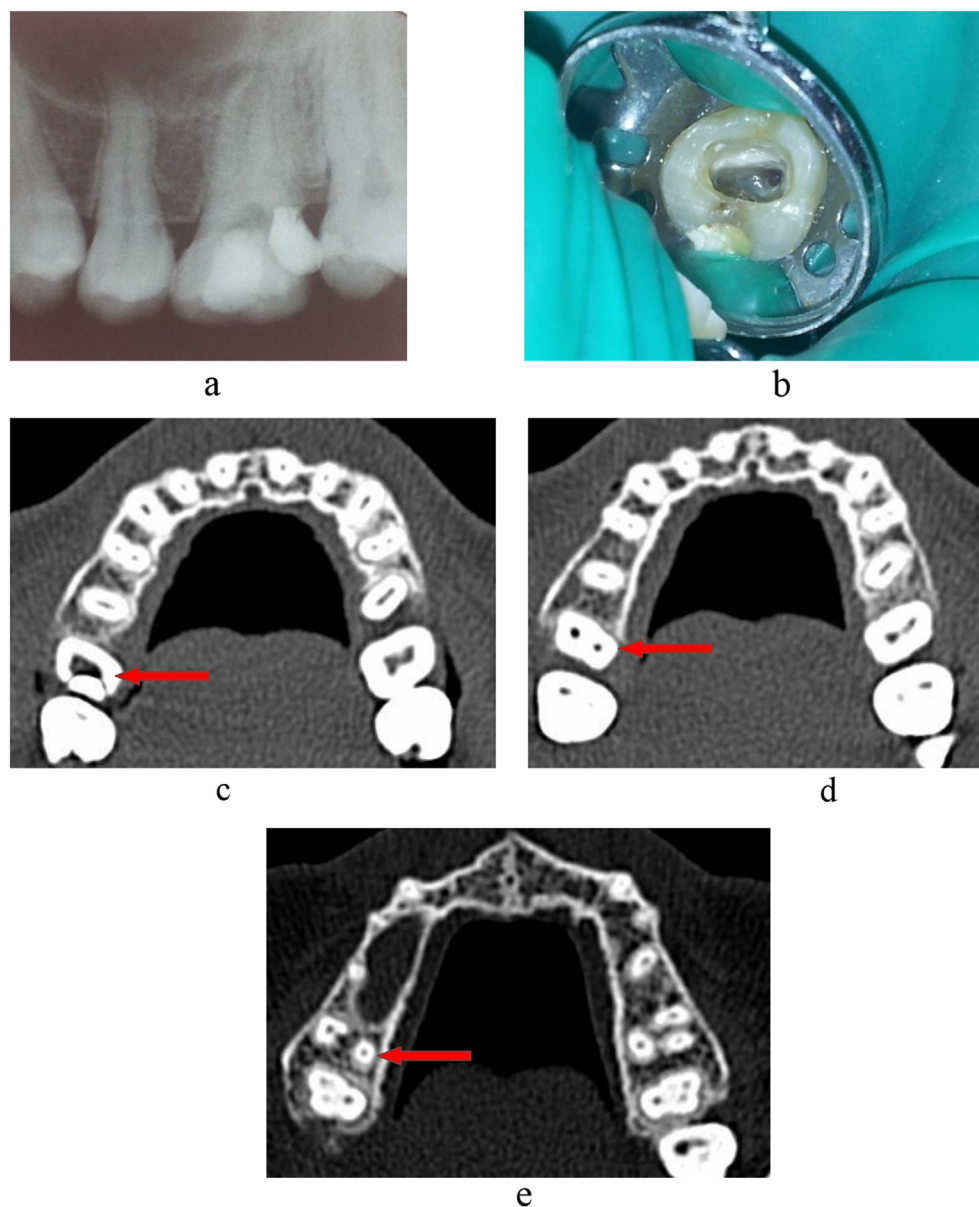


Fig. 1 – (a) Pre-operative radiograph. (b) Intraoperative photograph showing buccal and palatal root canal orifices. (c), (d) and (e) CT scan showing axial sections of coronal, middle and apical third of the tooth respectively (arrow).

To authenticate the clinical finding, the patient was referred for spiral CT and scanning was performed using Dentascan (GE Healthcare, USA) software. The morphology of 16 was obtained in cross sections of 0.5 mm thickness. Axial evaluation at coronal, middle, and apical third confirmed two separate roots with single canals in each (Fig. 1c, d and e).

The working lengths of the canals were determined by a Root-ZX II apex locator (J. Morita, Tokyo, Japan) and were confirmed with a periapical radiograph. The two root canals were biomechanically prepared using Mtwo rotary instruments (VDW GmbH, Germany) well supplemented with 2.5% sodium hypochlorite solution and 17% ethylene diamine tetra-acetic acid (EDTA) alternatively between each

instrumented files. Calcium hydroxide (Metapex, Meta Biomed Co., Ltd.) was placed as an intracanal medicament for canal disinfection and the tooth was temporized.

The patient was recalled after a week. The canals were re-entered and irrigated to remove calcium hydroxide. 2% of chlorhexidine (Asep RC, Stedman Pharmaceuticals Pvt. Ltd) was used as final irrigant. The canals were dried with absorbent paper points (Dentsply Maillefer, Ballaigues, Switzerland), and obturated using cold lateral compaction of appropriate gutta-percha points (Fig. 2a and b) (Dentsply Maillefer, Ballaigues, Switzerland) along with AH Plus resin sealer (Dentsply Maillefer, Ballaigues, Switzerland). Six month review radiograph (Fig. 2c) showed no signs of periapical pathosis and the patient was asymptomatic.

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