

Concealed anatomy revealed in routine endodontic treatment: two case reports

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Abstract:

In-depth comprehension of the dental anatomy and its variation of the human teeth becomes an essential prerequisite for the forensic science. Studies have documented a plethora of variations in canal configurations of the mandibular incisors and bicuspid. Anatomical variations have a major role in the identification of individuals who cannot be identified visually or by other means. Teeth can act as positive identification for an individual by keeping the accurate dental records. The current cases illustrate the peculiar morphology serving as a reminder that these variations can occur, which can add value to forensic science experts.

Key Words: 1.Revealed anatomy, 2.rare anatomy, 3.mandibular central incisors, 4.mandibular 2nd premolar.

Introduction

In-depth comprehension of the dental anatomy and its variation of the human teeth becomes an essential prerequisite for the forensic science. Vertucci has classified morphological configuration of the root canal systems in mandibular permanent incisors into eight types¹. Usually, the mandibular incisors have one root canal with one apical foramen (Vertucci Type I) or two root canals with one apical foramen (Vertucci Type II) but here we are reporting a rare case with occurrence of two root canals with two separate foramina (Vertucci Type IV) in the mandibular central incisor which has incidence of only 3% in population². Another case is also a rare anatomy with occurrence of two canals in mandibular 2nd premolar, which has reported incidence of 2.5% in population by Lu et al³.

Case 1: Mandibular Central Incisor

A 32 year-old female patient reported to the Department of Dentistry with the chief complaint of moderate pain in the lower front tooth since past 15 days. The medical history was non-contributory. The clinical examination revealed tenderness on vertical percussion and no response to thermal and electrical pulp sensitivity tests. Preoperative radiographic examination revealed radiolucency involving enamel, dentine and pulp with periapical lesion, two roots with two canals were also appreciated. The diagnosis of pulpal necrosis with chronic periapical abscess of the mandibular left central incisor was made. The radiographs

showed bifurcation at the level of middle third of root suggesting two roots with two canals having Type IV configuration stated by Vertucci. Root canal therapy was indicated (Figure 1 A,B,C,D).

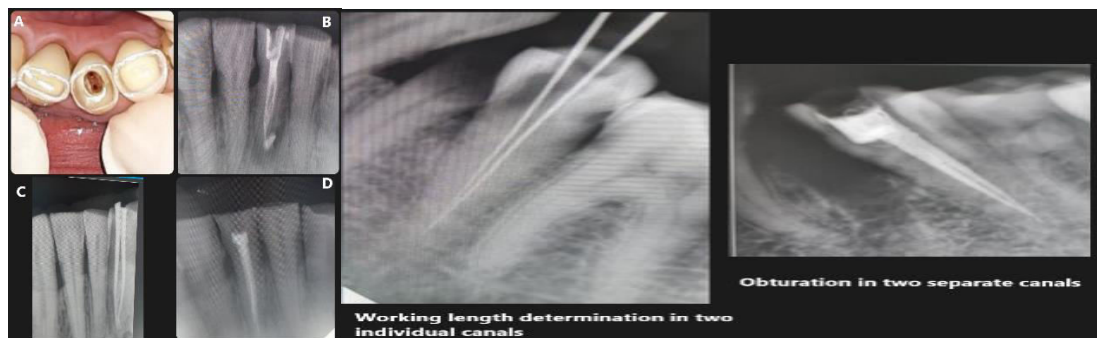


Figure 1: A: Revealing two foramina; B: Ca(OH)₂ dressing revealing two separate canals; C: Gutta Percha in two separate canals; D: Final obturation.

Figure 2: 2nd Premolar revealing two separated canals.

A 55 year-old female patient reported to the Department of Dentistry with the chief complaint of spontaneous pain which usually occur during night in the lower left back tooth since past 10 days. The medical history was noncontributory. The clinical examination revealed tenderness on vertical percussion and exacerbated response to thermal and electrical pulp sensitivity tests. Preoperative radiographic examination revealed radiolucency involving enamel, dentine and pulp with no periapical lesion, two roots with two canals were also appreciated. The diagnosis of Acute irreversible pulpitis of the mandibular 2nd premolar was made. The radiographs showed bifurcation at the level of middle third of root suggesting two roots with two canals (Figure 2). Root canal therapy was indicated.

Endodontic intervention followed for both cases;

Under local anesthesia administration and rubber dam isolation, access was gained with number four round bur and air turbine handpiece. Access cavity was made in accordance to tooth pulp chamber configuration. Both canals were negotiated with 10 k-file with copious irrigation with 5.25% sodium hypochlorite. Number 15 k-file was used to locate the working length. Canals were sequentially irrigated using 5.25% sodium hypochlorite and 17% EDTA during cleaning and shaping procedure. Biomechanical preparation was done, and calcium hydroxide intracanal medicament was placed inside the canal for 4 weeks in case 1. In next appointment, canals were cleaned once again with 5.25% sodium hypochlorite and 17% EDTA and normal saline. The canals were thoroughly dried, master cone was inserted, and obturation was done using standardized Gutta-percha with inert material. These patients were follow up for 3, 6, 8 months and found to be asymptomatic.

Discussion

Studies have documented a plethora of variations in canal configurations of the mandibular incisors and bicuspid. Thorough knowledge of these variations are insight to forensic experts. Anatomical variations have a major role in the identification of individuals who cannot be identified visually or by other means. Teeth can act as positive identification for an individual by keeping the accurate dental records. These unique traits and characteristics can provide key information to recognize malpractices, negligence, and fraud child abuse and identify an individual/deceased.

Conclusion

The current cases illustrates the peculiar morphology serving as a reminder that these variations can occur, which can add value to forensic science experts. Apart for this, in routine endodontics thorough knowledge of these variation can prevent endodontic failures or missed canals.

References

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