

Three-dimensional representation of teeth with root dilaceration

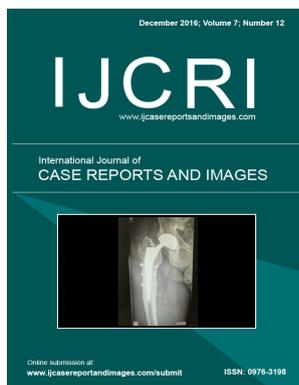
Toshiko Inoue, Makoto Saito, Fumio Nishimura, Takashi Miyazaki

ABSTRACT

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CASE REPORT

Dentists and maxillofacial surgeons may occasionally encounter various dental anomalies in number, shape, size, and eruption. One such anomaly is dilaceration of the root. The term “dilaceration” refers to an angulation, or sharp bend or curve, in the root or crown of a formed tooth [1].

Figures 1A, 1C and 1E show micro-computed tomographic images representing teeth with root dilaceration (indicated by arrows). Figure 1B, 1D and 1F show the three-dimensional root canal morphology of each tooth, confirming that the root canal morphology is also dilacerated.

DISCUSSION

Traumatic injuries to the primary teeth can result in a wide range of anomalies in the permanent successor teeth. Dilaceration is thought to be due to trauma during the period in which the tooth is forming, with the result that the position of the calcified portion of the tooth is changed and the remainder of the tooth is formed at an angle [2]. Intrusive trauma to the primary teeth is often associated with developmental anomalies in the permanent successors. The prevalence of intrusive

trauma to the primary incisors varies from 4.4–22% and the resulting developmental anomalies in the permanent incisors range from 12–74% [3].

Teeth with dilacerated roots pose a challenge to dentists. The root canal anatomy is complex (Figure 1), and dilacerated roots frequently present problems if the tooth requires extraction. Additionally, failure to recognize the curvature of the dilacerated root is one factor contributing to the higher incidence of failure of endodontic treatment in these teeth. To view the root canal morphology in three dimensions, computed tomography produces high-resolution images. Regarding as radiation exposure, the measured doses for the scans do not cause any radiation damage [4]. Furthermore, it has been reported that conventional micro-computed

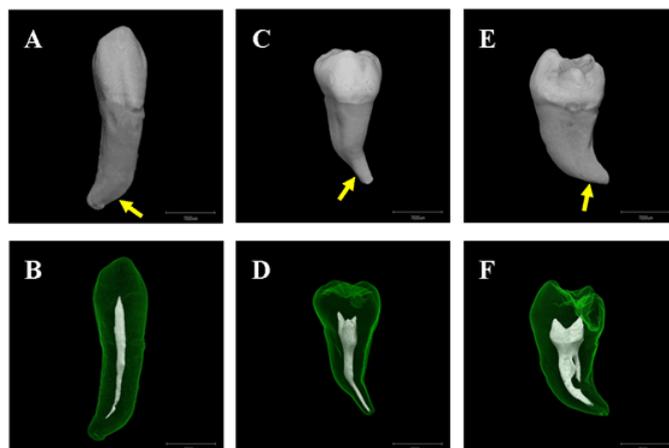


Figure 1: Examples of some types of curves and angles in dilacerated roots (A) Micro-computed tomographic image of root dilaceration of the maxillary canine in a 62-year-old male; (B) Three-dimensional representation of the root morphology of the tooth in Figure 1A; (C) Micro-computed tomographic image of root dilaceration of the lower premolar in a 58-year-old female individual; (D) Three-dimensional representation of the root morphology of the tooth in Figure 1C; (E) Micro-computed tomographic image of root dilaceration of the maxillary molar in a 67-year-old male; (F) Three-dimensional representation of the root morphology of the tooth in Figure 1E.

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tomography usually does not reach the risky dose level, while classical synchrotron imaging can degrade a DNA significantly [5].

CONCLUSION

Knowledge of tooth morphology and root canal anatomy in three dimensions is essential for successful treatment of teeth with dilacerated roots. Computed tomography images are useful guides for the successful treatment of anomalies such as root dilaceration.

Keywords: Teeth, Root, Dilaceration, Micro-computed tomography

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Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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