SOREDEX CASE STUDY

CBCT Features of the Root Canal Morphology in Second Maxillary Premolar Tooth

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A male patient, age 36, showed up in the Department of Restorative Odontology & Endodontics, School of Dental Medicine, Belgrade University, with undefined permanent pain in the right side of the upper jaw.

Since a precise location of a tooth or teeth, which could have been the source cause of pain, could not be diagnosed, neither by using all clinical tests nor by conventional radiographs, the patient was sent for a CBCT scanning.

The series of CBCT images, acquired by SCANORA® 3Dx (SOREDEX Oy, Tuusula, Finland), revealed an unusual feature of the root canal anatomy in the second maxillary premolar with type VII of Vertucci classification.

Fig. 1 Axial projection of the coronal third of the root of the second maxillary premolar indicating a single extremely oval ribbon-shaped canal (red arrow).

Fig. 2 Axial projection of the middle third of the root, revealing two round shaped buccal (green arrow) and palatal (red arrow) canals.
Fig. 3  Coronal projection of the middle third of the tooth, showing the changes in the root canal morphology.

Fig. 4  3D rendered view in the coronal projection, indicating the exact measurements of the length and width of the coronal and middle third of the root canal.

Fig. 5  3D rendered view in the coronal projection, indicating the exact measurements of the distance between the palatal and buccal root canals.

Fig. 6  3D rendered view in the sagittal projection, indicating the variation in the course of the root canals. The level, where a single canal divides and the intercanal septum is only visible, is marked with a fluo-green line.
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**Fig. 7** Sagittal projection, showing the variable course of the root canals.

**Fig. 8** Axial projection, revealing the level of the beginning of the apical third where two canals merge into a single canal.

**Fig. 9** Coronal projection of the same level as in Fig. 8. Coronal view of merging root canals.

**Fig. 10** Axial projection of the apical third, where a single canal divides into two separate canals: buccal (green arrow) and palatal (red arrow).
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**Fig. 11** 3D rendered, coronal view of the apical portion, revealing the merging and dividing of the root canals, ending in two separate foramina.

**Fig. 12** Sagittal projection, showing the curvature of the palatal root canal.

**Fig. 13** Sagittal projection, showing the curvature of the buccal root canal.

**Conclusion**

Irrespective to the complex root canal morphology of the second maxillary premolar, visualized by CBCT imaging (SCANORA® 3Dx, Tuusula, Finland), this tooth was not the cause of the diffuse pain in the right maxilla, but the first maxillary molar (showing two mesio-buccal root canals). Consequently, a root canal treatment was conducted.

CBCT imaging is a reliable and indispensable tool in complex endodontic pathology, increasing the treatment planning and the therapeutic outcome.