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A feasibility study of applying cone-beam computed tomography to observe dimensional changes in human alveolar bone

锥形束计算机断层摄影定位观察人类拔牙后牙槽突外形变化规律的可行性研究

Key words: Cone-beam computed tomography, Alveolar ridge remodeling, Extraction site

关键词：锥形束计算机断层摄影（CBCT）；牙槽突改建；拔牙位点

- knowledge about dimensional changes of human alveolar bone after tooth extraction is essential for implant treatment. So far, little accurate, non-invasive, and scientific systematic research has been conducted. The application of CBCT seems to be ideal. This study was designed to verify whether CBCT projection differences might influence the research accuracy.

- This study proposed an orientation method. By referencing a fixed anatomic point, the same horizontal slice from different CBCT scans of one patient could be found. By moving the same number of sagittal slices as originally recorded, the same sagittal slice could be found. The orientation method makes measurements comparable in a more scientific way.

- This study has proved that projection differences among CBCT scans taken at different time points from one patient can be neglected without affecting the accuracy of millimeter scale measurements. CBCT is a reliable imaging tool for continuously observing dimensional changes in human alveolar bone.

The orientation method to observe dimensional changes in human alveolar bone after tooth extraction

By referencing a fixed anatomic point, the horizontal slice in the first CBCT was set.

Among the first CBCT sagittal slice series, the number of sagittal slices between the starting point and the tooth to be extracted was calculated as *N*

By referencing the same fixed anatomic point, the horizontal slice in the second CBCT was set.

Among the second CBCT sagittal slice series, *N* slices was moved from the starting point to orient the extraction site