

The effect of scan parameters on cone beam CT trabecular bone microstructural measurements of the human mandible

Type: Article

Abstract:

The objective of this study was to investigate the effect of different cone beam CT scan parameters on trabecular bone microstructure measurements. A human mandibular cadaver was scanned using a cone beam CT (3D Accuitomo 170; J.Morita, Kyota, Japan). 20 cone beam CT images were obtained using 5 different fields of view (4X4 cm, 6x6 cm, 8X8 cm, 10x10 cm and 10X5 cm), 2 types of rotation steps (180 degrees and 360 degrees) and 2 scanning resolutions (standard and high). Image analysis software was used to assess the trabecular bone microstructural parameters (number, thickness and spacing). All parameters were measured twice by one trained observer. Intraclass correlation coefficients showed high intraobserver repeatability (intraclass correlation coefficient, 0.95-0.97) in all parameters across all tested scan parameters. Trabecular bone microstructural measurements varied significantly, especially in smaller fields of view ($p = 0.001$). There was no significant difference in the trabecular parameters when using different resolutions (number, $p = 0.988$; thickness, $p = 0.960$; spacing, $p = 0.831$) and rotation steps (number, $p = 1.000$; thickness, $p = 0.954$; spacing, $p = 0.759$). The scan field of view significantly influences the trabecular bone microstructure measurements. Rotation steps (180 degrees or 360 degrees) and resolution (standard or high) selections are not relevant.

Author	Ibrahim, N. ;Parsa, A. ;Hassan, B. ;van der Stelt, P. ;Aartman, I. H. A. ;Wismeijer, D.
Source	Dentomaxillofacial Radiology (A paid open access option is available for this journal.)
ISSN	0250-832X
DOI	10.1259/dmfr.20130206
Volume (Issue)	42(10)
Page	7
Year	2013

Keyword:

COMPUTERIZED-TOMOGRAPHY; VOXEL SIZE; ACCURACY; CBCT; QUALITY; REPRODUCIBILITY; RELIABILITY; RESOLUTION; ARTIFACT; IMPACT

URL:

- <http://apps.webofknowledge.com> search via Accession No >> 000328796300012
- Full text available at : <http://www.birpublications.org/doi/abs/10.1259/dmfr.20130206>