

## Visibility of the Borders of the Mandibular Canal: A Comparative in Vitro Study Using Digital Panoramic Radiography, Reformatted Panoramic Radiography and Cross Sectional Cone Beam Computed Tomography

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**Abstract :** Objectives: Determining the position of the mandibular canal prior to implant placement and surgeries of the posterior mandible are important to avoid the nerve injury. The visibility of the mandibular canal varies according to the imaging modality. Although panoramic radiography is the most common, slowly cone beam computed tomography is replacing it. This study was conducted with an aim to determine and compare the visibility of superior and inferior borders of the mandibular canal in digital panoramic radiograph, reformatted panoramic radiograph and cross-sectional images of cone beam computed tomography. Study design: digital panoramic, reformatted panoramic radiograph and cross sectional CBCT images of 25 human mandibles were evaluated for the visibility of the superior and inferior borders of the mandibular canal according to a 5 point scoring criteria. Also, the canal was evaluated as completely visible, partially visible and not visible. The mean scores and visibility percentage of all the imaging modalities were determined and compared. The interobserver and intraobserver agreement in the visualization of the superior and inferior borders of the mandibular canal were determined. Results: The superior and inferior borders of the mandibular canal were completely visible in 47% of the samples in digital panoramic, 63% in reformatted panoramic and 75.6% in CBCT cross-sectional images. The mandibular canal was invisible in 24% of samples in digital panoramic, 19% in reformatted panoramic and 2% in cross-sectional CBCT images. Maximum visibility was seen in Zone 5 and least visibility in Zone 1. On comparison of all the imaging modalities, CBCT cross-sectional images showed better visibility of superior border in Zones 2,3,4,6 and inferior border in Zones 2,3,4,6. The difference was statistically significant. Conclusion: CBCT cross-sectional images were much superior in the visualization of the mandibular canal in comparison to reformatted and digital panoramic radiographs. The inferior border was better visualized in comparison to the superior border in digital panoramic imaging. The mandibular canal was maximumly visible in posterior one-third region of the mandible and the visibility decreased towards the mental foramen.

**Keywords :** cone beam computed tomography, mandibular canal, reformatted panoramic radiograph, visualization

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