Comparison of the diagnostic value of indices localizing mandibular third molar roots relative to inferior alveolar canal in panoramic view and CBCT

Y Kheirandish[1*], M Panjnoush[1], H Bashizadeh[1], M Niknami[1], M Soltani[2]
[1]*Department of Oral and maxillofacial radiology,Tehran University of Medical Sciences , Iran*
[2] *Department of Prosthodontics, University of Islamic Azad Isfahan (Khorasgan) Branch, Iran*

Introduction
Although evaluation of mandibular impacted third molars and their vicinity to IAC could be achieved using panoramic view, this modality has some limitations including two dimensional nature and uneven magnification which emphasize the necessity of CBCT technique for more accurate results.

Materials and Methods
In this descriptive analytic study, 103 radiographs of mandibular impacted third molars were assessed using both panoramic and CBCT techniques. Roots' position in relation to IAC was evaluated by three oral& maxillofacial radiologists and was repeated two weeks later one more time. The results were compared to CBCT images afterwards. According to signs observed in panoramic view, the position of third molar roots in relation to IAC was designated as buccal, lingual or middle position. A chi- square test was used for data analysis and comparison between the observers. The significance level was determined as 0.05.

Results
Among 103 teeth, 56 were lingually positioned in relation to IAC (54.4%), 25 had middle position (24.3%) and 22 were buccally positioned in relation to IAC (21.3%) (P-value< 0.002). Root deviation, mandibular canal deviation, narrowing of roots, borders discontinuity and narrowing of mandibular canal were more frequent in buccal positions of roots in relation to IAC. However the sign of roots darkening was more frequent in lingual positions of roots in relation to IAC. Observers' agreement in assessing the signs and indices was in an acceptable level.

Conclusions
Although there are some indices in panoramic view to determine the relationship of third molar and IAC, this modality does not provide high diagnostic accuracy in this regard. On the other hand, CBCT is a valuable tool in evaluating the relationship of third molar and canal; therefore the risk of nerve damage during surgeries in third molar region could be reduced using this technique.

Keywords: Mandibular canal, Cone Beam Computed Tomography, Panoramic radiography, impacted mandibular third molars