The study of correlation between inferior alveolar nerve canal and mandibular third molar

Advisors Rapeeporn Malungpaishrope, DDS., Kanjana Singkharotai, DDS

Researchers Chanakarn Sapkrueyart, Hasamon Ballungpattama, Lalita Likidpongpaisarn
Kruekfar Kasorntumkittiwuit, Ronnaporn Tusangiam

Background

When performing mandibular third molar (M3M) surgical removal, there was a possible risk of nerve injury. The main reason for the complications were the proximity between the inferior alveolar nerve (IAN) and the root of the M3M. Therefore, this research had recognized the importance of the pre-operative procedure of assessing the relationship between the nerve and the M3M before the operation by using cone beam computed tomography images (CBCT) to reduce the chances of nerve injuries.

Objective

This study aimed to determine the relationship between angulation, class, and position of M3M and the nerve proximity, and study the position and distances between M3M and the inferior alveolar nerve canal (IANC).

Materials and methods

The study used panoramic and CBCT images of 61 M3M from the database of College of Dental Medicine, Rangsit University. Panoramic images assessed using Planmeca Romexis® dental imaging software to measure angulation, class, position and nerve proximity. CBCT images assessed using CS 3D imaging software to measure nerve position and nerve distance. The results were analyzed for relationship level using bivariable logistic regression analysis.

Results

The horizontal impaction was most likely to have nerve proximity. This result was not statistically significant (p >0.05), while vertical/distoangular impaction showed nerve proximity 7.81 times lesser than mesioangulation and this result was statistically significant (p=0.018). Class II impaction was most likely to have nerve proximity. Position B impaction was most likely to have nerve proximity. These results were not statistically significant (p>0.05). Lingual position of IANC was 100% nerve contact in nerve proximity cases.

	Odd ratios	P-value	95% conf. interval
Angulation			
Mesioangulation *(reference)*	1†		
Vertical/distoangulation	0.1211	0.018*	0.0209 - 0.7013
Horizontal angulation	0.4014	0.396	0.0487 - 3.3039
Class			
I *(reference)*	1†		
II	3.2573	0.201	0.5332 - 19.8972
III	N/A	N/A	N/A
Position			
A *(reference)*	1†		
B	2.7653	0.222	0.5397 - 14.1690
C	N/A	N/A	N/A

*Shows statistical significance (p < 0.05)
† Reference category

Conclusions

Vertical/distoangular impaction had the least chance of IAN proximity compared to other variables, while the horizontal impaction had the most chance of proximity. The nerve contact tended to be in the lingual position.

Keywords

cone beam computed tomography, mandibular third molar, inferior alveolar nerve

scan me