

## **Analysis of Pattern of Mandibular Third Molar Impaction and the Presence of Caries of Adjacent Second Molar Tooth – A Retrospective Cone Beam Computed Tomography Study**

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Mandibular third molar is the commonest tooth to get impacted due to various local and systemic factors. Impacted mandibular third molar (ILTM) may lead to complications in adjacent mandibular second molar, such as caries development, root resorption and periodontal disease. This study aims to evaluate the pattern of ILTMs and its relationship with the occurrence and progression of caries in adjacent second molars. This retrospective descriptive study was conducted at the Division of Radiology, Department of Oral Medicine and Periodontology, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka. Out of the 478 Cone Beam Computed Tomography (CBCT) images of the patients who underwent CBCT examinations from January 2021 to December 2023, 400 CBCT images were selected with a convenient sampling method and analysed. Impaction was assessed by two classifications in relation to occlusal plane, mandibular ramus and long axis of second molar. The collected data were statistically analysed using IBM SPSS version 25.0. The chi-square tests were performed for the statistical analysis. Pell and Gregory Position-A Class-I impaction was the commonest type (41.50%), while mesioangular impaction was the predominant orientation (39.25%) under Winter's classification. Individuals aged 21-30 years old showed higher impaction rates, greatly affecting second molars. The prevalence of mandibular second molar caries was found to be 47.25%. Females were more prone to mesioangular impaction (20.50%) and had higher occurrence of Position-A or Position-B with Class-I impactions, frequently associated with second molar caries than males. A significant correlation for caries on mandibular second molar with position ( $p = 0.011$ ,  $p < 0.05$ ), class ( $p = 0.007$ ,  $p < 0.05$ ) and angulation ( $p = 0.000$ ,  $p < 0.05$ ) of ILTM was detected using both classifications accordingly. This study emphasizes the significant association between mesioangular ILTM and adjacent second molar caries with sex and age, influencing impaction pattern and caries risk. Age-specific strategies, further studies with larger sample sizes, and longitudinal studies are suggested to understand prolonged effects of mandibular third molar impaction.

**Keywords:** Impaction, mandibular third molar, second molar caries, mesioangular