# SUMMARY

Relationship between status of third molars and occurrence of dental and periodontal lesions in adjacent second molars in the Polish population: a radiological retrospective observational study.

INTRODUCTION

Third molars (M3) are the last teeth to erupt in the permanent human dentition and account for 98% of all impacted teeth. Difficulties with proper oral hygiene of this anatomical area and M3 malposition may influence prevalence of caries, external resorption from pressure and loss of periodontal tissues in the distal surface of the second molar (M2).

AIM OF THE STUDY

The aim of the following work was to answer the following questions:

* + - 1. Does the presence of third molar increase the odds of caries and external resorption on the distal surface of the second molar?
      2. Does the presence of third molar increase the odds of alveolar bone loss distal to the second molar?
      3. Does the degree of impaction of the third molar affect the odds of developing above-mentioned pathologies?
      4. Does the position of the third molar in relation to the long axis of the second molar affect the presence of the above-mentioned pathologies?

MATERIALS AND METHODS

The study was conducted according to Declaration of Helsinki (1973, updated in 2002) and was accepted by Ethics Committee of Medical University of Warsaw (MUW, protocol code AKBE/291/2019). 2,488 panoramic radiographs of patients who were referred to the Department of Mucosal and Periodontal Diseases of the Medical University of Warsaw in 2020-2022 were examined. The presence of the adjacent third molar along with its degree of impaction and inclination relative to the long axis of the second molar as well as the occurrence of caries, external resorption due to pressure and periodontal tissue loss on the distal surface of the second molar were assessed. Only the presence of the above-mentioned pathologies was recorded, not their advancement. Patients’ age and gender were taken from electronic records. The statistical analysis was performed using the Statistica 13 program, the threshold of statistical significance was set to p<0.05.

RESULTS

Out of all subjects, 1,842 patients (74.04%) had at least one erupted M3, 631 participants (25.36%) had at least one partially impacted M3, and 303 participants (12.18%) had at least one completely impacted M3. M3. In 1738 second molars caries were found on the distal surface, in 141 there was external resorption of the distal root, and in 1571 there was bone loss distal to M2.

Based on multivariative logistic regression analysis, odds ratios (OR) and 95% confidence intervals (CI) were calculated for caries, external resorption and periodontal tissue loss in the area of second molars in the absence and presence of an erupted, partially or completely impacted third molar. Third molars were also divided according to their inclination into horizontal, mesioangular, vertical and distoangular. In the presence of an erupted third molar, the odds ratio for the above-mentioned pathologies were 1.35 (1.14-1.47, p<0.0001), 0.33 (0.22-3.11, p=0.4534) and 0.46 (0.32-1.44, p=0.1737). When the tooth adjacent to the second molar was a partially impacted third molar, the odds ratios were 1.67 (1.20-2.45, p<0.0001), 15.55 (10.15-24.33, p<0.0001) and 6.37 (3.82-12.38, p<0.0001), respectively, and in the presence of a completely impacted third molar, the ORs for the above pathologies were 0.32 (0.11-1.43, p=0.82), 22.81 (13.37-34.91, p<0.0001) and 1.34 (1.19-2.81, p<0.0001), respectively. The greatest impact on the development of pathology in the second molar had the third molars positioned horizontally and mesioangularly [OR 1.68 (1.43-2.13, p<0.0001) and 1.18 (1.05-1.76, p<0.0001) for caries, 10.09 (5.58-19.12, p<0.0001) and 5.17 (2.86-9.15, p<0.0001) for external resorption, as well as 1.67 (1.31-2.17, p<0.0001) and 1.73 (1.16-2.56, p<0.0001) for alveolar bone loss, respectively]. The risk of caries and periodontitis increased with the patient's age. When patients’ gender was taken into account, male gender was associated with a higher risk of developing periodontal disease. On the other hand, female gender was more susceptible to caries.

SUMMARY

The presence of third molars increased the odds of caries, external resorption and alveolar bone loss on the distal surface of the second molar. The odds ratio of these pathologies increased with the age of the patients. Partially impacted third molars increased the risk of caries and bone loss on the distal surface of the second molar, while completely impacted third molars were associated with a higher risk of external root resorption of the distal second molar. In particular, mesioangularly and vertically impacted third molars increased the risk of caries, external resorption, and bone loss on the distal surface of the second molar.