Impacted Third Molars Increase the Risk for Caries and Periodontal Pathology in Neighboring Second Molars

**SUMMARY**

**Subjects**

The material was drawn from the US Department of Veterans Affairs Dental Longitudinal Study beginning in 1969 in Boston, Massachusetts. From a group of 1231 men the authors identified 416 subjects (mean age 45.8 ± 7.4 years) who had both first and second molars present in at least one quadrant. Upper and lower quadrants were included. Third molar status (n = 804 teeth) was assessed from panoramic and intraoral radiographs. Subjects were examined clinically every 3 years by a periodontist. Subjects were included in the analysis if they had had at least one follow-up examination.

**Key Risk/Study Factor**

It was suspected that the status of the third molar is associated with the pathology of the neighboring tooth. Third molar status was examined from radiographs and classified into one of four categories: (1) absent, (2) erupted, (3) unerupted and impacted in soft tissue, or (4) unerupted and impacted in bone. A tooth was regarded as impacted in bone if more than two-thirds of the crown was covered by bone.

**Main Outcome Measure**

The distal surfaces of the second molars were examined for caries and periodontal pathology. Caries on the distal coronal surface of the second molar was recorded as caries experience, including primary or secondary caries or a filled surface. Periodontal pathology of the second molar was defined as distal alveolar bone loss of 20% or greater or a distal probing depth of more than 4 mm.

**Main Results**

Cross-sectional analysis provided the prevalence of distal surface caries and periodontal pathology. Second molars adjacent to erupted third molars were more likely than second molars adjacent to absent third molars to have distal caries (p < 0.001, odds ratio [OR] = 1.73; 95% confidence interval [CI]: 1.23, 2.43). Related to periodontal pathology, second molars adjacent to soft tissue impacted third molars were more likely than second molars adjacent to absent third molars to have distal bone loss (OR = 4.93; 95% CI: 1.59, 15.2) and distal probing depth > 4 mm (OR = 3.98; 95% CI: 1.57, 10.1). Second molars adjacent to bony impacted third molars were more likely than second molars adjacent to absent third molars to have distal bone loss (OR = 2.64; 95% CI: 1.31, 5.34). All analyses were adjusted for age, smoking status, and educational status.

Longitudinal analysis showed the incidence of distal surface pathology. Compared to second molars adjacent to absent third molars, those adjacent to soft tissue impacted third molars were at highest risk (relative risk [RR] = 4.88; 95% CI: 2.62, 9.08) for developing any one of the measured pathologies, followed by those adjacent to bony impacted third molars.
(RR = 2.16; 95% CI: 1.56, 2.99), and those adjacent to erupted third molars (RR = 1.74; 95% CI: 1.34, 2.25).

Conclusions
Second molars adjacent to absent third molars were at lowest risk for developing pathology, whereas second molars adjacent to soft tissue impacted third molars were at greatest risk. The authors concluded that retention of third molars was associated with an increased risk of second molar pathology in middle-aged and older adult men.

COMMENTARY AND ANALYSIS
The results of this article confirm the findings of earlier studies. Merit comes from the excellent statistical analysis. I agree with the conclusion of the authors that third molars are responsible for the pathology of second molars. In addition to the cited references, which are mostly from the United States, our study group has presented similar results regarding the third molar status related to the health of adjacent second molars. The harmful effect of an existing third molar on the neighboring tooth can be detected even in young adults. We also found differences between the upper and lower jaws that were not reported in the present study.

This study represents exceptionally long follow-up of subjects with third molars and may be one of the longest studies conducted. However, not all subjects were followed up for 25 years, with the inclusion criteria limited to having at least one follow-up examination. This means that some subjects had been followed up for only 3 years. In addition, the exact data about individual follow-up periods are not presented.

The age range of the subjects was rather wide, from 28.1–76.2 years. The standard deviation of the mean age was also high (±7.4 years). The exact age distribution of subjects was not given. Therefore the proportion of different age cohorts is not known. All analyses were, however, adjusted for age, so that the results can be considered reliable. However, the results may be of limited generalizability because all of the subjects were men. It is known that the dental health of men is generally worse than that of women, so the second molar status of the entire population may be better than in the study sample.

Third molars in the elderly have not been frequent subjects for study. This study offers insight into the survival and side-effects of third molars. Third molars are usually the first teeth to be extracted, followed by all other molar teeth. The survival of third molars in the middle-aged male group was poor, with 57.2% of third molars already extracted from the included quadrants. According to the present study, however, this low prevalence of third molars proved to be beneficial for the health of neighboring teeth.

With respect to the clinical relevance of the study, caries and periodontal diseases are common oral diseases. Second and third molars are not immune to these phenomena. Second molar caries may be treated conservatively as all other carious teeth. Periodontal pathology is nearly inevitable, and regular visits to the dentist are needed throughout life. Furthermore, the results of the study emphasize the responsibility of individuals to take care of everyday individual oral hygiene measures, especially in the molar area. Finally, removal of third molars because of increased risk of pathology on the neighboring tooth may be a relevant consideration in selected patients.

REFERENCES

REVIEWER
Ventä Irja, DDS, PhD
Associate Professor, Department of Oral and Maxillofacial Surgery, Institute of Dentistry, University of Helsinki, P.O. Box 41, 00014 University of Helsinki, Finland
irja.venta@helsinki.fi