

Changes Over Time in Position and Periodontal Probing Status of Retained Third Molars

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Purpose: This study was designed to assess changes over time in third molar position relative to the occlusal plane and in the periodontal probing status of third molars in asymptomatic subjects who had at least 1 third molar below the occlusal plane at baseline and retained all third molars to follow-up.

Patients and Methods: Between 1998 and 2002, healthy subjects with 4 asymptomatic third molars and adjacent second molars were enrolled in an institutional review board (IRB)-approved longitudinal study. Clinical and radiographic data of 146 subjects who had at least 1 third molar not fully erupted at baseline with at least 2-year follow-up were analyzed. At baseline and longest follow-up, full mouth periodontal probing, 6 sites per tooth, including third molars was conducted. An indicator variable was used to record periodontal status (probed, not probed) for each third molar. A periodontal probing depth (PD) greater than or equal to 4 mm in the third molar region was considered indicative of periodontal pathology. Panoramic radiographs were analyzed to assess whether unerupted third molars erupted to the occlusal plane. To assess descriptively the influence of age and length of follow-up on the change in third molar position and periodontal status, subjects were stratified by age at enrollment as younger (<25 years) or older (≥25 years) and by length of follow-up as shorter follow-up (2 to <4 years), or longer follow-up (4 or more years). Because of the small sample sizes in each stratum, analyses are limited to descriptive statistics only.

Results: Sixty-six percent of the 146 subjects were less than 25 years old at enrollment. The majority were female and Caucasian. Sixty-eight percent of the 97 younger subjects and 43% of the 49 older subjects presented at baseline with all 4 third molars not fully erupted. Of 584 third molars evaluated, 79% were not fully erupted at baseline; of 462 molars, 80% could not be probed at baseline. Eruption to the level of the occlusal plane occurred in all 4 strata although only a third of the unerupted molars reached the occlusal plane even in the younger subjects with the longer follow-up. Of 369 molars that could not be probed at baseline, approximately 35% could be probed at follow-up with the highest percentage of change in the older subjects with the longer follow-up (46%).

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Conclusions: The anatomic position of third molars was not static over time even if subjects were greater than 25 years old. Thus, unerupted third molars should be monitored for changes in position and periodontal pathology as long as the teeth are retained.

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Clinicians are often questioned by patients about potential for future changes in the position and clinical health of third molars that are not fully erupted. Epidemiologic studies reviewing changes in third molar position over time are few and incomplete, primarily because the outcome data are skewed by third molars often being missing. In a cross-sectional analysis of a Scandinavian population, Hugoson and Kugelberg¹ reported that 77% of those 20 years old had 4 third molars whereas only 32% of 30-year-olds had 4 third molars. Third molars could have been removed during the decade to treat pathology or to prevent it. These circumstances make it difficult for clinicians to confidently advise patients about the probable fate of retained third molars not erupted to the occlusal plane, the functional anatomic position of these teeth in the mouth.

The position of unerupted third molars can change in a number of ways. The teeth may change angulation without any communication or exposure to the oral cavity. Alternately, third molars may change position and become exposed to the oral cavity with the likelihood that oral flora will colonize in a nonshedding biofilm on the exposed surface. This biofilm may be clinically inaccessible because of the anatomic position of the third molars. In this circumstance repeated mechanical removal of the biofilm is likely impractical or impossible. If the persistent biofilm is colonized by periodontal pathogens, periodontal disease progression may follow.

Although clinicians believe it less likely after jaw growth is complete, third molars may erupt to the occlusal plane becoming functional and useful clinically without clinical evidence of periodontal pathology.

This study was designed to assess changes over time in third molar position, and the periodontal probing status of third molars and the adjacent second molars at longest follow-up, in asymptomatic subjects who had at least 1 third molar below the occlusal plane at baseline and retained all third molars from baseline to follow-up.

Patients and Methods

The data for these analyses are derived from a larger project involving volunteer subjects enrolled with 4 third molars and adjacent second molars in an IRB-approved trial at 2 academic clinical centers, the Uni-

versity of Kentucky and the University of North Carolina. Subjects were enrolled over a 4-year period ending in 2002.

Participants were asked to retain third molars for the duration of the trial and were compensated for data gathering visits. Inclusion criteria for the larger longitudinal trial dictated that participants be healthy (American Society of Anesthesiologists Physical Status Classification I, II as determined by the clinician examiner) and have no third molar symptoms. Participants who had the most severe form of periodontal disease determined by clinical exam (American Academy of Periodontology IV), reported being pregnant, or reported having taken any systemic antibiotics within the previous 3 months were excluded from participation.

Subjects did not receive their routine dental care from the study, but were encouraged to seek regular care from a general dentist of their choosing. After clinical data were collected, however, each subject had a dental prophylaxis at baseline and at each subsequent data gathering visit, assuring that each subject considered for these analyses had a minimal level of periodontal care for at least 2 visits.

Study subjects for these analyses had to have at least 1 third molar below the occlusal plane at baseline and a follow-up at least 2 years after baseline data were collected.

Baseline demographic data and data assessing oral health were available for each subject. Panoramic radiographs were taken at baseline and follow-up to assess the degree of eruption of each third molar at or below the occlusal plane as suggested by Hugoson and Kugelberg.¹

Full mouth periodontal probing, 6 sites per tooth including third molars, was conducted at baseline and longest follow-up to assess periodontal status. The third molar region was defined as the 6 periodontal probing sites around the third molars and the 2 sites on the distal of the second molars. A PD greater than or equal to 4 mm in at least 1 site was considered indicative of periodontal pathology at the tooth or region level.^{2,3} If the third molar was not clinically accessible by periodontal probe at a data gathering visit, the probing status of the third molar was considered to be "not probed."

Subjects were stratified both by age at enrollment, under 25 years old or at least 25 years old, and by longest follow-up, 2 to 3 years, or at least 4 years. The

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