

Difficulty of Impacted Mandibular Third Molar Tooth Removal: Predictive Ability of Senior Surgeons and Residents

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Purpose: The present study investigated whether residents are able to estimate the degree of difficulty of mandibular third molar removal to the same extent as senior surgeons.

Materials and Methods: The study included 2 residents and 2 senior surgeons, each of whom extracted 50 mandibular third molars of similar complexity. The clinical variables evaluated included patient age, gender, body size, maximal mouth opening, and tongue interference. The radiographic variables related to the third molars examined on the panoramic radiographs included spatial positioning, tooth–bone interface, root morphology, and proximity of the tooth to the inferior alveolar canal. Before each extraction, the operating surgeon estimated the level of difficulty of the surgery after considering all the variables. The predicted length of time per operation was regarded as representative of operative difficulty. At the end of each operation, its actual duration was also recorded.

Results: The residents and senior surgeons both accurately predicted the difficulty of surgery in just more than one half of the cases. A 57% agreement ($\kappa = 0.24$) was found between the senior surgeons' preoperative estimations and actual difficulty, and the agreement was 52% ($\kappa = 0.19$) for the residents' estimations. No significant difference was found between the senior surgeons and residents in the accuracy of their estimations of operation length.

Conclusions: The preoperative prediction of the surgical difficulty of mandibular third molar tooth removal was unreliable, not only for the residents, but also for the senior surgeons.

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Third molar removal is one of the most frequently performed operations in oral and maxillofacial surgery (OMS). Although it is commonly a straightforward and low morbidity procedure, complications can arise. The difficulty of the surgical removal of third molars will vary from routine to complex. An association between increased surgical difficulty and prolonged recovery after third molar removal has been reported.¹⁻³ Complications can also be expected to be more commonly encountered as the surgical difficulty increases.^{4,5} Gathering accurate information

on the variables related to the difficulty of third molar extraction is important when designing an appropriate procedure and when implementing precautions intended to minimize the risk of complications. Preoperative patient evaluation will allow the surgeon to inform the patients of the possibility of complications associated with surgery and what outcomes to expect during the postoperative period.

Numerous parameters have been investigated that have a potential bearing on the prediction of complexity and difficulty of third molar tooth surgery.

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Age, gender, angulation, impaction on the horizontal and vertical planes, morphology of the roots, follicle size, periodontal ligament width, and the relationship of the roots to the inferior alveolar canal have all been reported to be associated with operative difficulty.⁶⁻¹³

All these factors can influence the amount of bone to be removed, the need for root and/or crown sectioning, and accessibility to the surgical site. For instance, bone becomes less elastic in older individuals owing to a reduction of its organic component. Consequently, the bone surrounding the tooth will impede enlargement of the exit route, requiring the removal of more bone during extraction of the impacted tooth. The amount of bone covering the impacted tooth also dictates the amount of bone to be removed during extraction. Moreover, the inclination of an impacted tooth will govern its exit route. Root morphology is important in dictating the mode of surgical technique (eg, root sectioning) to minimize the risk of root fracture. Surgical access can also be hindered by a number of other factors, including limited mouth opening and interference by the tongue.

In OMS departments, residents will initially be assigned less difficult procedures and then gradually perform more complex cases under senior supervision. This helps to reduce the risk of intraoperative and postoperative complications. Jerjes et al¹⁴ reported a greater rate of postoperative complications after third molar surgery in the group treated by junior surgeons compared with the rate for the group treated by their senior counterparts. Therefore, the preoperative evaluation of the parameters related to the complexity of an operation and the determination of its degree of difficulty should facilitate a decision regarding whether the operation should be undertaken by a junior or senior surgeon.

Residents and senior surgeons might interpret the degree of difficulty of the given surgical parameters differently because the relative lack of experience of residents could be expected to limit their ability to predict the surgical difficulty. However, assessing the difficulty of third molar removal in conjunction with its associated factors will usually be quicker compared with most other types of procedures in OMS. Only a few studies have been published that have weighed the estimating ability of trainees against that of surgeons in relation to the difficulty of third molar removal.^{15,16} Macluskey et al¹⁵ reported no direct relationship between the predictive ability for surgical difficulty and level of experience of dental hospital staff. In contrast, Ferrús-Torres et al¹⁶ showed that human error in the estimation of the degree of difficulty of third molar tooth removal decreases as surgical experience increases. Therefore, the aim of the present study was to compare the predictive ability of the

experienced oral-maxillofacial surgeons to that of the residents regarding the difficulty of third molar removal.

Materials and Methods

RECRUITMENT OF PATIENTS AND CLINICIANS

The participants in the present multicenter study included 1 senior surgeon and 1 resident from each of the 2 oral-maxillofacial surgery clinics of the dental schools of Ondokuz Mayıs and Suleyman Demirel Universities in Turkey. The senior surgeons, both of whom were women and 43 years old, had similar experience in terms of years of practice (approximately 10 years). The 2 residents (1 woman, 26 years old, and 1 man, 25 years old) were in their second year of OMS training. Each unit included 100 consecutive patients scheduled for surgical removal of a mandibular third molar. Therefore, a total of 200 patients were included in the present study. The senior surgeons undertook the extractions of the third molar in one half of the patients, and the residents removed the teeth in the other half. The allocation of patients was conducted by assigning 1 patient from the daily appointment list, consecutively alternating between the senior and junior surgeons. The exclusion criteria were the presence of any major systemic disease and the absence of a second molar adjacent to the extraction site. The institutional clinical studies ethics committee of Suleyman Demirel University approved the study, and all participants provided informed consent.

PREOPERATIVE RECORDS

Before the surgical removal of third molars, evaluations were made of the clinical and radiographic factors that can be associated with surgical difficulty. Assessments were made of the clinical factors, which included patient age, gender, and weight and access to the surgical site (ie, maximum mouth opening and tongue interference). In addition, radiographic examination of the orthopantomographs was performed. The depth of impaction in both vertical and horizontal planes (determined according to the Pell and Gregory classification) and tooth angulation (determined according to the Winter classification) were used as variables related to spatial positioning of the tooth. Although the tooth-bone interface was examined for periodontal membrane space and follicle space, the root morphology in terms of the root form, root number, and formation was assessed. The proximity of the impacted tooth to the inferior alveolar canal was determined according to the Rood classification (1990).

Before surgery, the level of difficulty of each extraction was intuitively estimated by the operating surgeon after a consideration of the sum of the clinical

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