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Assessment Of Difficulty Index Of Impacted Maxillary Third Molar Extractions: An Institutional Study

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Abstract:

Estimating the problem of removing third molars may be a common dilemma. However, the estimation of the problem related to maxillary third molar surgery has not yet been defined. The aim of this study was to assess the degree of difficulty and identify predictor variables related to the occurrence of difficulty with the removal of impacted maxillary third molars.

MATERIALS AND METHODS: The data was collected from patient records and the data was analysed between june 2019 to march 2020, Saveetha dental college and hospital, chennai. Predictor variables indicative of surgical difficulty were classified by their demographic, clinical, and radiographic aspects. Degree of surgical difficulty was categorized as low, moderate, or high based on the surgical technique used. Then the data was entered in spss software to obtain statistical analysis. Categorical variables were expressed in terms of frequency and percentage and bar graphs were plotted. The statistical significance of the associations were tested using chi - square test at p<0.05.

RESULTS: In males 16.67%of the extractions were minimally difficult, 15% of the extraction were moderately difficult and 18.33% of extraction were severely difficult.In females 13.33% of the extractions were minimally difficult, 18.33% of the extraction were moderately difficult and 18.33% of extraction were severely difficult. In cases of 18, 15% of the extractions were minimally difficult, 10% of the extraction were moderately difficult and 26.67% of extraction were very difficult. In cases of 28, 15% of the extractions were minimally difficult, 23.33% of the extraction were moderately difficult and 10% of extraction were very difficult.

CONCLUSION: From the study we can conclude that the assessment of difficulty index in performing the maxillary third molar extractions reveals moderate to severe difficulty in most of the cases and it is influenced by various factors like age, periodontal condition and the complexity of the impaction and the co-morbidity of the Patients. For cases with a high degree of difficulty, identification of predictor variables could be useful for graduate students and inexperienced clinicians, to plan before executing the procedure, thus avoiding complications that always require complex management.

KEYWORDS: Difficulty index, Extraction, Innovative technique, Mandibular third molar.

Introduction:

Greater awareness on the part of the population and advances within the democratization of access to dental treatment are reflected during a significant increase within the number of surgeries for the removal of impacted third molars(1,2).Third molar extraction is that the commonest procedure in oral surgery and requires considerable planning and skill in diagnosis and intraoperative and postoperative management(3). Thus, surgeons should base their protocol on scientific evidence regarding the estimation of the degree of surgical difficulty of each case. Historically, several efforts are made to determine a reliable assessment model(4–9). Although many proposals are postulated, all are directed at lower third molar surgery; maxillary third molar surgery has been overlooked, which predisposes the surgery to complications.

Winter grouping of impaction, number of roots, root bend, tooth connection to maxillary sinus(10–13)(14–19), tooth connection to second molar, profundity of lift tip, crown width, and periodontal space)(20,21). There are no prospective studies beyond the preventive aspect of the measurement of surgical difficulty(22).Our team has extensive knowledge and research experience that has translated into high quality publications(23–26).(27).In a study the authors propose the existence of predictors of surgical difficulty within the removal of impacted upper third molars which will be detected in the preoperative phase.(28).

The precise aims of our study were to 1) determine the degree of surgical difficulty encountered in impacted maxillary third molar surgeries and 2) correlate preoperative factors with surgical difficulty in patients undergoing this procedure

Materials and Methods:

Data retrieval
Saveetha dental college and hospital manages its patients' data using the dental information archival system. Patient demographics (age/gender/annual family income), contact, address (rural/urban), chief complaint, treatment plan, consent, treatment performed, high definition pre/post-operative photographs are fed into the software to allow smooth inter-departmental coordination and have a single source of information portal to avoid delays and ambiguity. Each case is allotted a unique identification number by DIAS which prevents duplication of cases. Furthermore, each case was checked thoroughly for completeness with regard to details required for the study. Data was extracted, and treatments were categorized for each patient based on the ADA classification/nature of treatment and entered into an excel sheet; and data was randomly checked at regular intervals for accuracy by two independent dentists to verify veracity and avoid errors.

This retrospective study was conducted by inspecting data of all the maxillary third molar extraction cases managed in our institute from March 2019 to December in the year 2020. Study protocol was approved by the institutional ethical committee and parental consent was obtained for all the patients included in the study prior to treatment. All the cases who were provided with dental care in our center were included. Patients with incompletely filled case sheets, patients who were not willing for treatment, and

treated under general anaesthesia were excluded from analysis.The study was based on Random sampling method to minimise the sampling bias, all the cases were reviewed priorly and included.

In the preoperative stage, the indicator factors were arranged into the accompanying gatherings: demo-realistic (sexual orientation, age, and weight list), clinical (mouth opening and related pathologies), and radio-realistic (level of occlusal plane, accessible retro-molar space, Winter grouping of impaction, number of roots, root shape, tooth connection to maxillary sinus, tooth connection to second molar, profundity of lift tip, crown width, and periodontal space).

Statistical Analysis: The variables were coded and the data was imported to SPSS Using SPSS Version 23.0. categorical variables were expressed in terms of frequency and percentage and bar graphs were plotted The statistical significance of the associations were tested using chi - square test.

**Difficulty index for removal of impacted maxillary third molars**

CLASSIFICATION	DIFFICULTY INDEX VALUE
Angulation	
Mesioangular	1
Horizontal/transverse	2
Vertical	3
Distoangular	4
Depth	
Position A	1
Position B	2
Position C	3

Sinus relationship	
No Sinus Approximation	1
Sinus Approximation	2

Difficulty index: very difficult: 7–10, moderately difficult: 5–7, minimally difficult: 3–4

Results:

The association between the impacted tooth number and gender of the patients is depicted in figure 1. The association between the impacted tooth number and the age of the patients is depicted in figure 2. The association between the difficulty index of the impacted tooth and the age group of patients is depicted in figure 3. The association between the difficulty index of the impacted tooth and the gender of patients is depicted in figure 4. The association between the difficulty index of the impacted tooth and the impacted tooth number is depicted in figure 5.
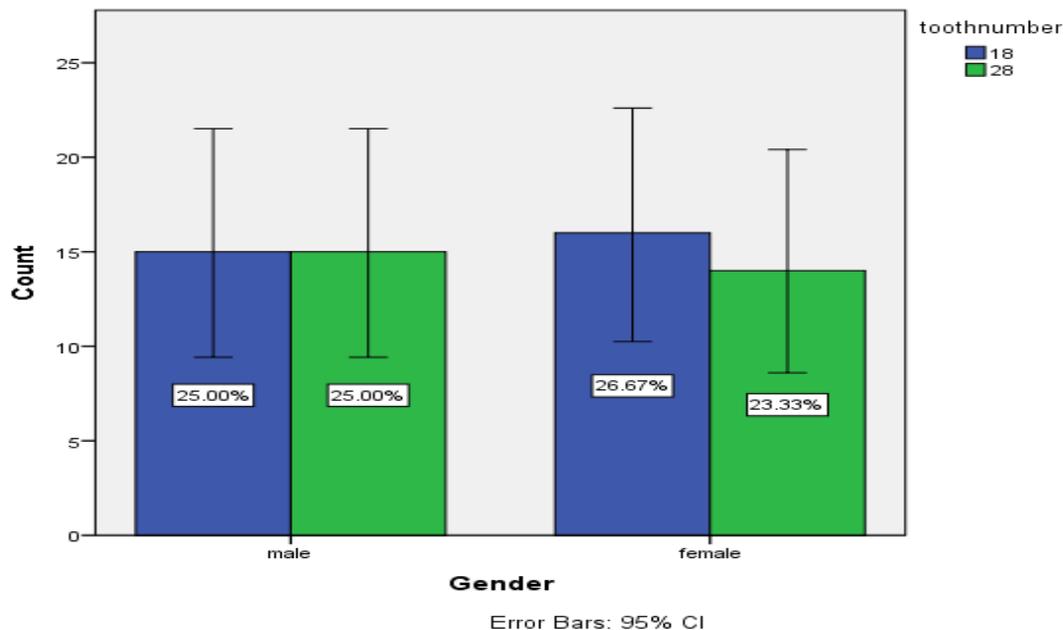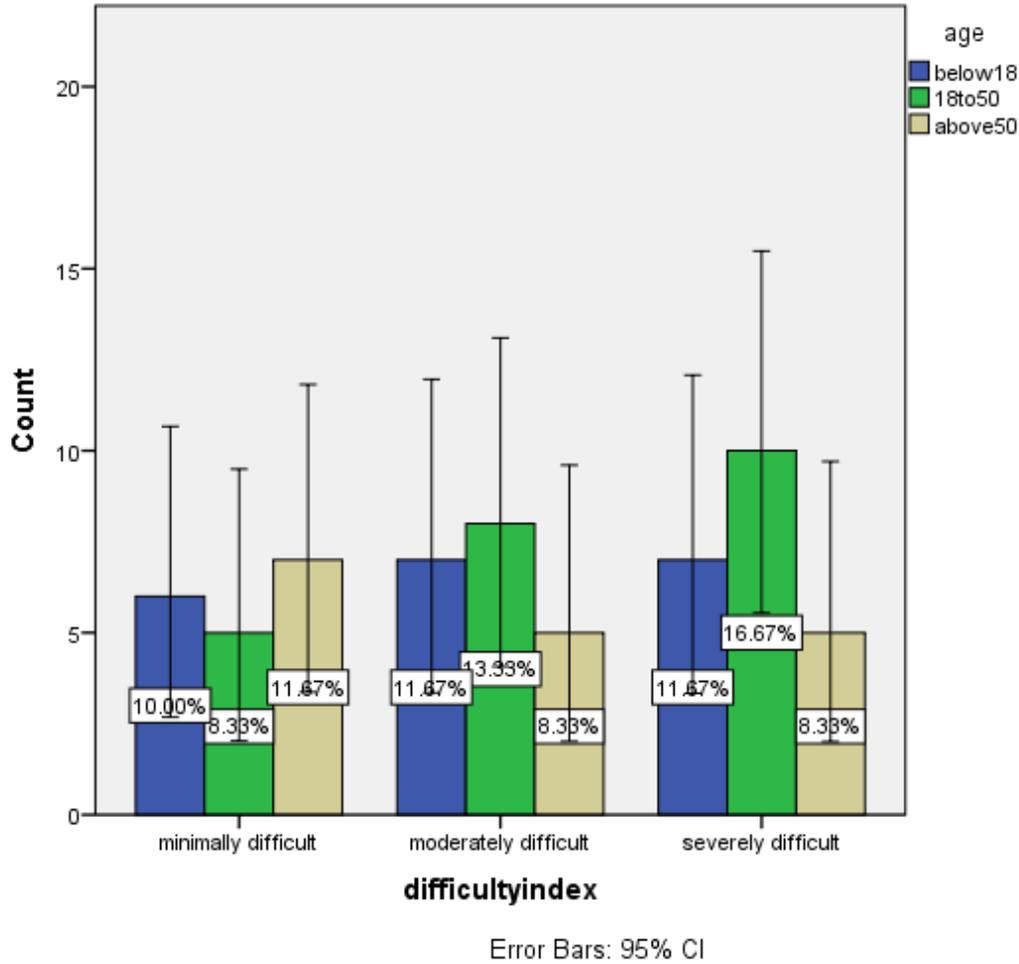

Figure 1. Bar graph denoting the association between the impacted tooth number and gender of the patients. X axis denotes the gender of the patients and the Y axis denotes the tooth number. Blue colour

denotes 18 (maxillary right third molar), and the green colour represents 28 (maxillary left third molar). Males who came to the hospital had equal extraction of 18 and 28, that is 25%. 26.67% of females extracted 18, whereas 23.33% of females extracted 28. Chi-square test was done and the association was found to be statistically not significant. The P value: 0.222 (p>0.05). Hence statistically not significant.


Error Bars: 95% CI
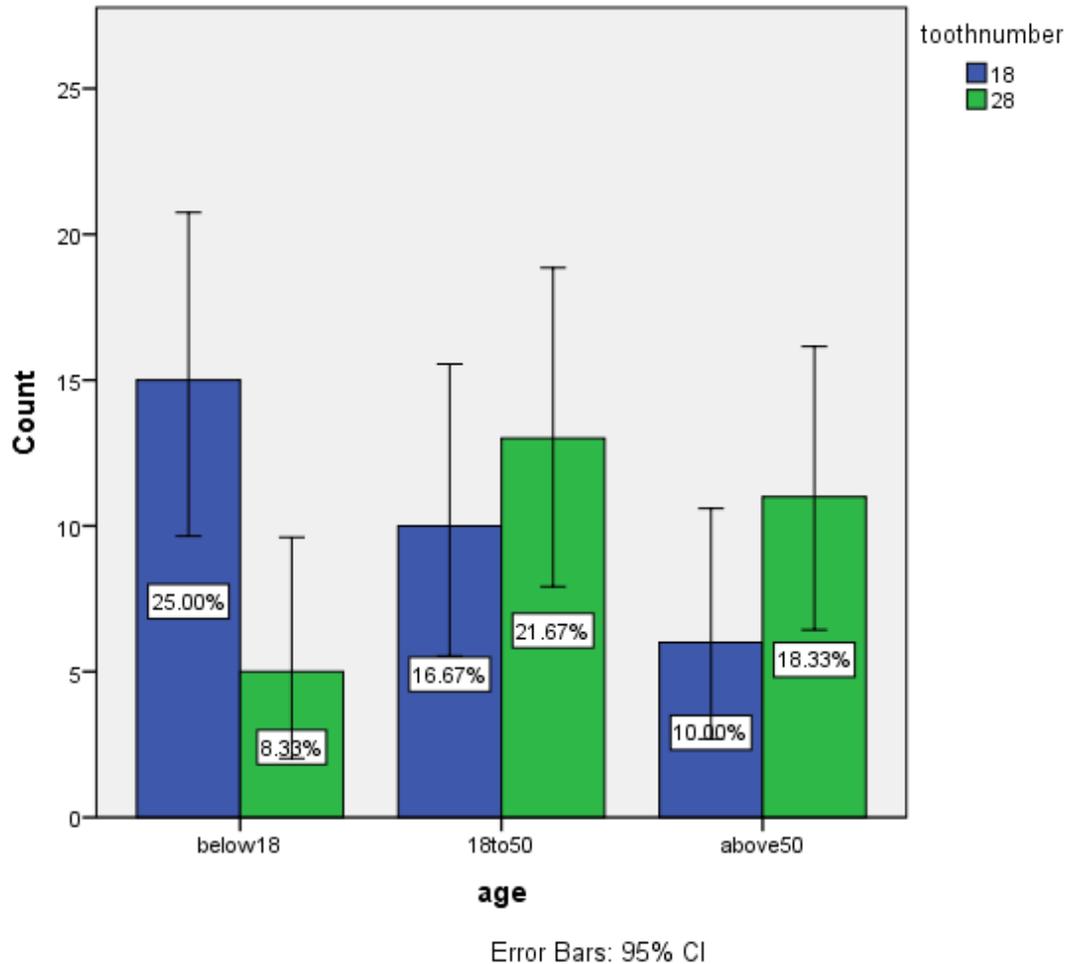
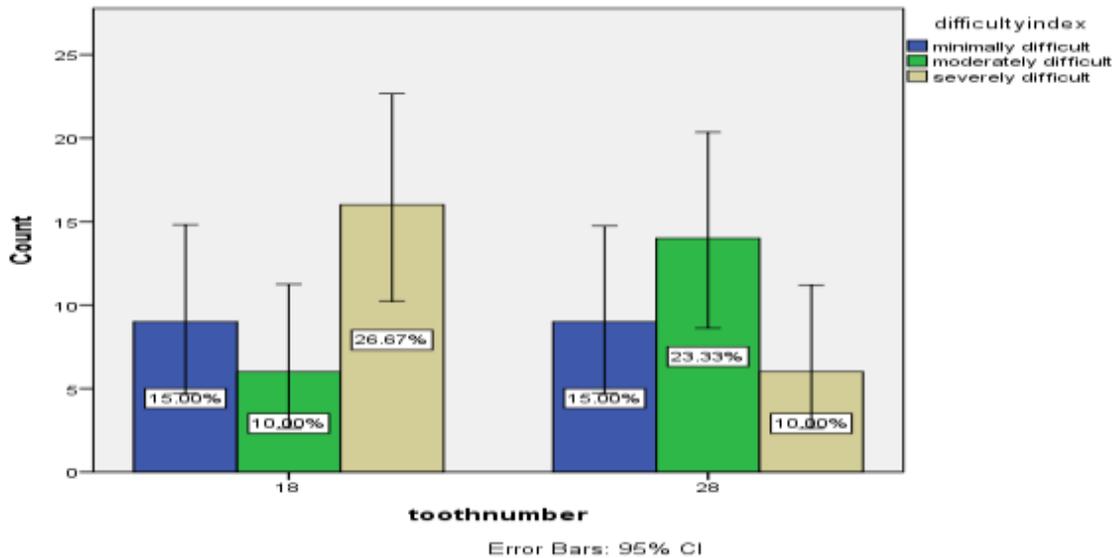**Figure 2 :The association between the tooth number and the age group of patients.**
X axis denotes the age group of patients and the Y axis denotes the impacted tooth number. Blue
colour denotes the 18 which is maxillary right third molar and green colour denotes 28 which is
maxillary left third molar. 25% of below18 age group patients had their 18 extracted 8.33% of
the same age group people had their 28 extracted. 16.67% of 18-50 age group patients had their
18 extracted 21.67% of the same age group people had their 28 extracted. 10% of patients above 50 years
had their 18 extracted 18.33% of the same age group people had their 28 extracted.
Chi-square test was done and the association was found to be statistically not significant: The p
value :0.224 (p>0.05).Hence statistically not significant.

Figure 3: the bar graph denotes the association between the difficulty index of the impacted tooth and the age group of patients. The X axis denotes difficulty index of the impacted tooth and the Y axis denotes the age of the patient.The blue colour depicts the age group below 18 years, the green colur depicts the age group 18-50 and the yellow colour depicts the age group above 50 years. The results were as at the age group of below 18, the extraction was 10% minimally difficult, 11.67%were moderately difficult and 11.67%were severely difficult. At the age group of 18-50 the extraction was 8.33%minimally difficult, 13.33%were moderately difficult, and 16.67% were severely difficult. At the age group of above 50 the extraction were 11.67%minimally difficult 8.33 were moderately difficult and 8.33% were severely difficult. Chi-square test was done and the association was found to be statistically not significant: The p value :0.346(p>0.05).Hence statistically not significant.
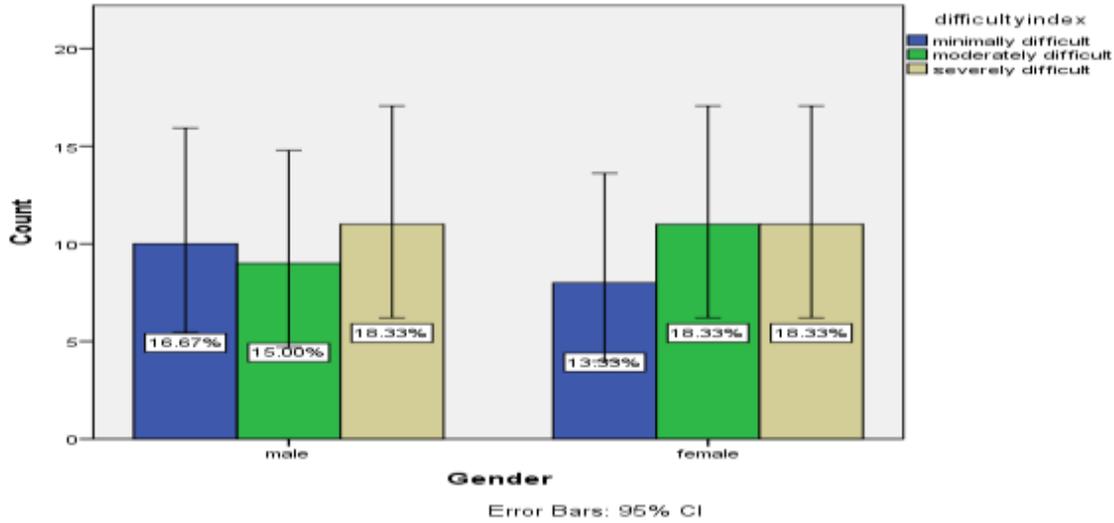
Figure 4: The bar graph denotes the association between the difficulty index of the impacted teeth and the gender of patients. The X axis denotes the gender and the Y axis denotes the difficulty index of the impacted tooth. Blue colour denotes minimally difficult extraction. Green colour denotes moderately difficult extraction and Yellow colour denotes severely difficult extraction. In males 16.67%of the extractions were minimally difficult, 15% of the extraction were moderately difficult and 18.33% of extraction were severely difficult.In females 13.33% of the extractions were minimally difficult, 18.33% of the extraction were moderately difficult and 18.33% of extraction were severely difficult.Chi-square test was done and the association was found to be statistically not significant: The p value :0.119 (p>0.05).Hence statistically not significant.

Figure 5: The bar graph denotes the association between the difficulty index and the tooth number. X axis denotes the tooth number and the Y axis denotes the difficulty index. Blue colour denotes minimally difficult extraction. Green colour denotes moderately difficult extraction and yellow colour denotes very difficult extraction. In cases of 18, 15% of the extractions were minimally difficult, 10% of the extraction

were moderately difficult and 26.67% of extraction were very difficult. In cases of 28, 15% of the extractions were minimally difficult, 23.33% of the extraction were moderately difficult and 10% of extraction were very difficult.

Chi-square test was done and the association was found to be statistically not significant: The p value :0.365 (p>0.05).Hence statistically not significant.

Discussion:

The aim of the present study was to determine the degree of surgical difficulty and identify predictor variables associated with the occurrence of difficulty in the removal of impacted upper third molars. The authors propose the existence of predictor variables that can be detected in the preoperative phase. The following were the specific aim of the study is to assess the difficulty index and surgical complications in extraction of maxillary third molars. The scarcity of publications addressing maxillary third molar surgery may potentially lead students and dental surgeons to underestimate this procedure, thus exposing patients to a greater chance of develop- ing serious complications Third molars in both the mandible and maxilla may develop at a distance from their normal location because of unusual proliferation of odontogenic epithelium before development of tooth germ. In the maxilla the teeth may be displaced as far as the floor of the orbit. Access to such displaced and inverted maxillary teeth can be a problem.(29).

Authors in a previous study stated that radiographs are not a reliable method for predicting the possibility of oroantral perforation. Therefore, surgeons should obtain reliable tomographic information regarding the depth of impaction when planning to remove such teeth. The associations of age with depth of impaction and classification of the mesial-distal position were significant. In older patients, maxillary third molars tended to be classified as low and in the mesioangular and vertical positions. These associations are important because the incidence of radiographic lesions increases with age, and partially impacted mesioangular third molars exhibit a high incidence of caries or periodontal bone loss in the adjacent second molar. Moreover, mesioangular and horizontal third molars are more strongly associated with the external root resorption of second molars, and one study reported that a significantly greater number of cases were diagnosed based on CBCT images than panoramic radiographs (30)

According to several studies, age is the single most consistent factor in the determination of difficulty in the removal of lower third molars. This positive correlation may be related to the increase in bone density, which can result in a need for greater management during the procedure. However, for maxillary third molars, the results showed that age was not a determinant factor(31). Surgical difficulty during the removal of impacted maxillary third molars is generally moderate. For cases with a high degree of difficulty, identification of predictor variables could be useful for graduate students and inexperienced clinicians, to plan before executing the procedure, thus avoiding complications that always require complex management.

Thus, surgical difficulty may be expected when the tooth is in a deeper position inside the bone due to limited access to the surgical site and the need to remove a larger amount of bone.

Conclusion:

From the study we can conclude that the assessment of difficulty index in performing the maxillary third molar extractions reveals moderate to severe difficulty in most of the cases and it is influenced by various factors like age, periodontal condition and the complexity of the impaction and the co-morbidity of the Patients. This study addresses the assessment of the difficulty of extraction, which has previously been overlooked by students, dental surgeons, and researchers. The underestimation of such surgical difficulty predisposes patients to a greater risk of complications.

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Conflict of Interest :NIL.

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