

Evaluation of difficulty index of impacted mandibular third molar extractions

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ABSTRACT

When compared to other teeth, third molars have a greater rate of impaction. Third molars that have been impacted are commonly encountered in dental practice, and it is the reason for complications in third molar surgery. The most commonly performed surgical procedure by dental practitioners is the third molar extraction. Despite a well-planned surgical approach, there are complications in lower third molar extractions. This study analyzes the expected difficulty during surgical removal of lower third molars that are impacted. This study analyzes the expected difficulty during the removal of impacted lower third molars by surgery. With the data from our dental institution database, the difficulty index by Pederson was used to evaluate the difficulty level of the extraction. Using SPSS, data were analyzed and results were obtained. Among impacted left mandibular third molars (38), minimal difficulty in 20.60% of the extractions, moderate difficulty in 29.58% of the extractions, and most difficulty in 2.77% of extractions were present. Among impacted right mandibular third molars (48), minimal difficulty in 18.80% of the extractions, moderate difficulty in 25.78% of the extractions, and most difficulty in 2.47% of extractions were present. According to our study, there is moderate difficulty in impacted lower third molar surgery, and it depends on factors such as systemic status and patient's age, periodontal condition, and complexity of tooth position in the dental arch.

Key words: Difficulty index, extraction, impacted teeth, innovative technique, lower third molar

INTRODUCTION

Impacted third molar surgery is commonly performed in dentistry. Third molars have a higher rate of developmental

abnormalities, are unsuitable for soft-tissue environments and it has poor access to oral hygiene. The indications for extraction of third molars may be dental caries, periodontal disease, orthodontic treatments, pericoronitis, cyst, and tumor formation associated with the impacted teeth.^[1-3]

Infections are prevalent both preoperatively and postoperatively after third molar removal, unlike any other operation. This appears to be more prevalent following partial and complete removal of bony impactions. Infections can appear as quickly as a few days after the treatment or later, and they can be restricted to the location of the third molar or spread to other parts of the face. The majority of

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infections may be treated with simple local measures and antibiotics.^[4,5]

Complications in lower third molar surgery are common. Possible complications include swelling, pain, trismus, mandibular fracture, nerve injury, and space infections. Another complication of the mandibular third molar extraction is root fractures, especially apical thirds. During their retrieval, additional bone removal is necessary, thereby leading to the risk of damage to the surrounding structures such as the inferior alveolar canal.^[6,7] Common postoperative complications of third molar extractions are bleeding, dry socket, sensory nerve injury, and infection.^[8,9] Our team has done enormous research in this field and has published high-quality research in various journals.^[10-24] A proper knowledge regarding the difficulty to be encountered during the impacted lower third molar surgery will help in adequate preparation for surgery and result in uneventful treatment outcomes. This study analyzes the expected difficulty during the removal of impacted lower third molars by surgery.

MATERIALS AND METHODS

All the patients who underwent impacted mandibular third molar extraction in our dental institution were evaluated in this study. The study was initiated with the ethical approval number-(SDC/SIHEC/2021/DIASDATA/0620-0321/). The difficulty index used for evaluating the difficulty of the extraction of the lower third molars was the Pederson difficulty index. It is a universally accepted standardized and validated difficulty index with scores of 7–10 indicating very difficult; 5–7 denoting moderately difficult and 3–4 indicating minimally difficulty, while removal of impacted mandibular third molars.

Data were collected from 4000 cases using the patient database from June 1, 2020, to March 31, 2021. This study included patients who underwent impacted lower third molar surgery. The extraction's complexity level was determined using the Pederson difficulty index. Anatomical and radiographic parameters such as angulations, depth, and ramus relationship are used to calculate the Pederson difficulty index.

Statistical analysis

Using SPSS statistical package for social science for windows versions, 20.0, SPSS Inc, (Chicago IU, USA) with the Pearson's Chi-square test (at $P < 0.05$), results were obtained.

RESULTS

Results obtained in our study are depicted in Figures 1-5.

DISCUSSION

It is crucial to assess the extraction's complexity in an outpatient clinic, so that the procedure's duration and

appointment time with the patient may be predicted. Furthermore, postoperative problems have been linked to the pattern of the impacted third molar and the difficulty of extraction.^[25] The surgical difficulties of third molar surgery are critical in determining the best treatment strategy. Surgical extractions are often performed for both preventive and therapeutic reasons. Although their removal is a frequent minor oral surgical treatment, it can cause problems such as swelling, alveolar osteitis, inferior alveolar nerve paresthesia, pain, and trismus.^[7]

In the present study, patients in the age group 19–50 had the 49.25% of difficult third molar extraction which is in accordance with that reported by Renton *et al.*^[26] The increase in bone density also increases the difficulty of the extraction. Patients at an early age have very high bone density and the periodontal status of the patient also highly influences the difficulty level of the extraction.^[27] A higher degree of difficulty was recorded in patients of advancing age. During third molar surgeries, old patients had more complications than young patients.^[28]

In our study, 4.82% of the patients of age below 19 years had difficult third molar extraction which is in accordance with that reported by Osunde and Saheb.^[29] The bone surrounding tooth is softer in younger patients when compared to the elderly and hence surgical removal of the tooth is difficult in the latter.^[30,31]

The study limitations include the difficulty of the extractions was only assessed using the Pederson difficulty index and

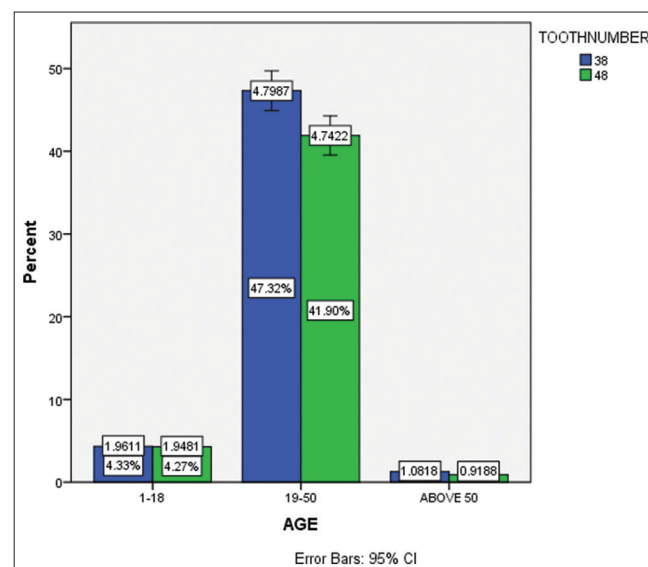


Figure 1: Bar chart describing the distribution of impacted tooth numbers based on the age group category of the patients. 4.33% and 4.27% of 1–18 age group patients had their 38 and 48 extracted, respectively. 47.32% and 41.9% of 19–50 age group patients had their 38 and 48 extracted, respectively. 1.26% and 0.9% of patients above 50 years had their 38 and 48 extracted, respectively. $P = 0.224$, statistically not significant. CI: Confidence interval

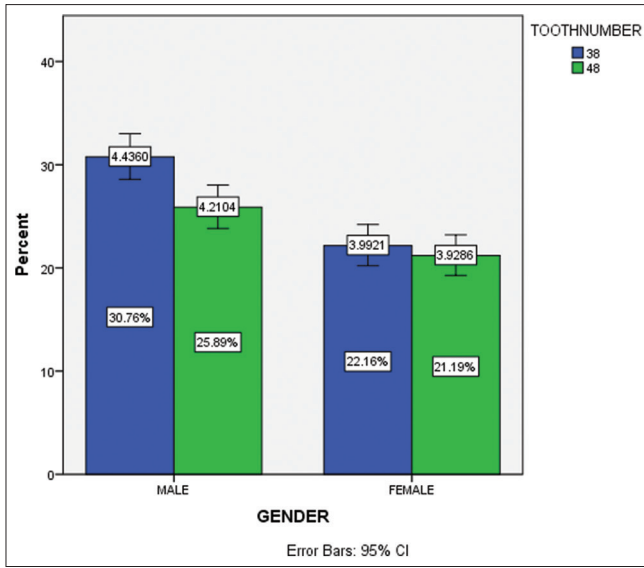


Figure 2: Bar chart describing the distribution of impacted tooth numbers based on the gender category of the patients. 30.76% of the males and 22.16% of the females had their 38 extracted. 25.89% of males and 21.19% of females had their 48 extracted. $P = 0.196$, statistically not significant. CI: Confidence interval

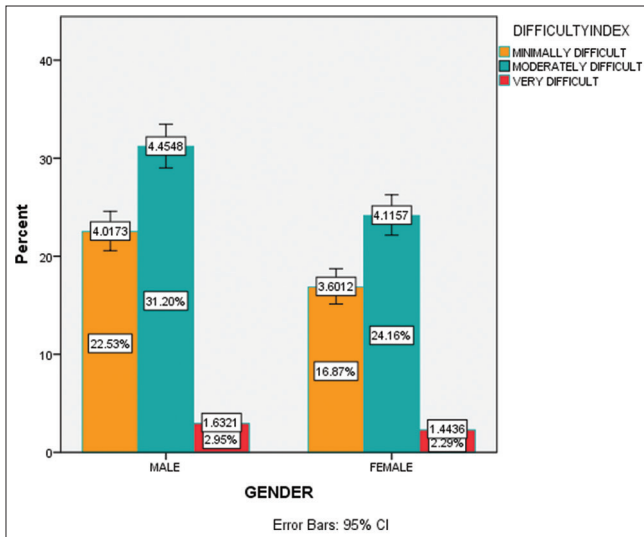


Figure 4: The bar chart denotes the difficulty index of the impacted tooth based on the gender of the patients. $P = 0.119$, statistically not significant. CI: Confidence interval

other difficulty indices were not considered. In future, to obtain accurate results correlation between various types of difficulty indices with clinical methods of difficulty assessment should be done.

CONCLUSION

It can be concluded from the study that there is moderate difficulty in the surgical removal of mandibular third molar teeth that are impacted, and it depends on factors such as systemic status and age of the patient, periodontal

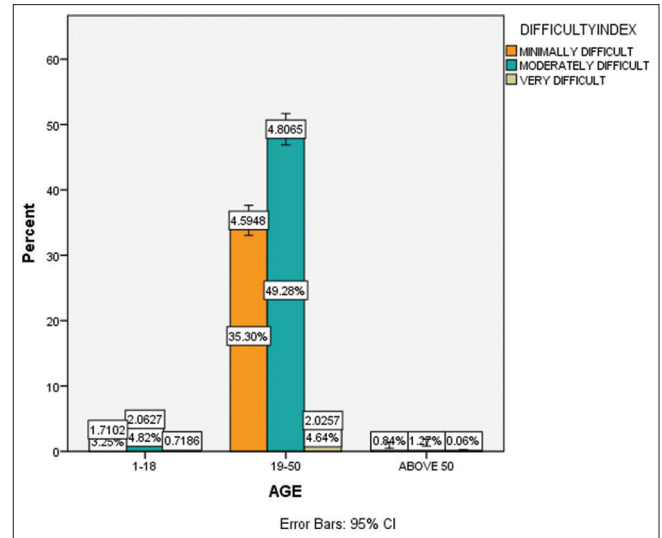


Figure 3: Bar graph depicting the difficulty index of the impacted tooth based on the age group category of the patients. $P = 0.346$, statistically not significant. CI: Confidence interval

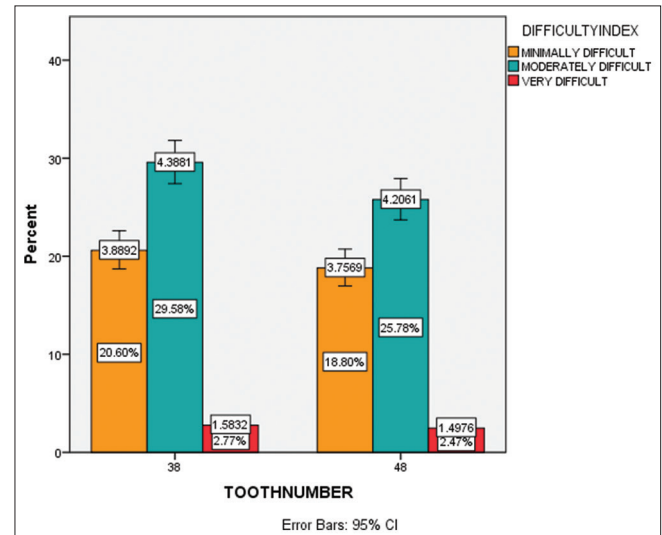


Figure 5: The bar graph denotes the difficulty index of the impacted tooth based on the impacted tooth numbers. $P = 1.365$, statistically not significant. CI: Confidence interval

condition, and complexity of the tooth position in the dental arch.

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Conflicts of interest

There are no conflicts of interest.

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