

# MALE FEMALE RATIO AMONG PATIENTS UNDERGOING IMPACTION REMOVAL IN SAVEETHA DENTAL COLLEGE

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**Abstract:** Impaction refers to the condition whereby the tooth fails to erupt and attain a proper level of occlusion. The procedures wherein the teeth cannot be removed only with the help of extraction forceps are considered to be difficult extraction procedures. Moreover, they require direct access and minimal reduction of the alveolar bone. Mandibular 3rd molars followed by maxillary canines are the most commonly impacted teeth till date. There are 2 types of impaction namely partial and complete impaction. A condition wherein only a fraction of the impacted tooth is erupted and visible to the naked eye, though it does not reach its level of occlusion is termed as partial impaction. Complete impaction is a condition where the tooth completely fails to erupt in the arch. Lack of space in the jaws or crowding of existing teeth is the main cause for impaction. This elicits access to the tooth and cleaning, difficult, thereby causing dental caries and resorption of root to the adjacent tooth depending on the type of impaction. The degree of difficulty of Impaction of mandibular third molars depends on the type of operation and the risk of postoperative complications, mainly iatrogenic trigeminal nerve injury. Difficult extraction procedures such as impaction inflicts trauma to the tissues which inturn leads to inflammatory reaction culminating in postoperative complications. The most common postoperative complications are trismus or lockjaw and neurological disturbances. In recent days, there is a necessity for minimizing trauma in terms of difficult extraction procedures for better healing and to avoid post-operative complications. From the study, it can be estimated that among 760 patients who have undergone impaction removal procedures, among which the number of male patients were 436 and the number of female patients were 324. The male female ratio was 1.3:1 (male: female). Predominant gender with maximum number of impaction removals was Male. To estimate the predominant age group of impaction removal, patients were divided into 3 age groups. Group 1 includes 18-30 years, group 2 includes 31-45 years and group 3 includes 46-70 years of age. From the study, it was estimated that impaction removal was commonly undergone by group 1 patients i.e. 18-30 years of age.

**Keywords:** Extraction, Impaction removal, Inferior alveolar nerve, Mandibular canal, Neurosensory disturbances

**INTRODUCTION:**

A condition wherein the tooth fails to erupt and attain its level of occlusion is termed as impaction. Numerous theories were proposed owing to the high incidence of mandibular third molar impaction, among which one of the most popular theories is impaction due to insufficient development of the retromolar space<sup>1</sup>. The growth of the Mandibular ramus is related to the resorption at anterior surface and deposition at posterior surface, but if there is a disturbance in this process, then the mandibular third molars

will be impacted due to insufficient spacing for its complete growth. Proper eruption of mandibular third molars also depends on their path of eruption which can either be favourable or unfavourable. If the tooth bud is mesially angulated during initial stages of root development and calcification, then the path of eruption will be unfavourable. In general, it can be stated that impaction of mandibular third molars mainly occurs when there is a decrease in the angulation of the mandibular plane and an increase in the angle of mandible. Studies have found the relation between the root angulation and impaction wherein angulated roots were more common in impacted mandibular third molars as compared to completely erupted mandibular third molars<sup>2</sup>. Some authors have also stated the other important third molar impaction causes which includes, malposition of the tooth germ, hereditary factors, lack of sufficient eruption force for third molars, and the theory of phylogenetic regression of the jaw size which causes insufficient mesial movement of the dentition of modern human due to the lack of interproximal attrition.

Some of the well-known classification systems for determining the difficult extraction procedures based on radiological evaluation are Wharfe, Winters lines, and Pell and Gregory classification. Pell and Gregory put forth a classification that established 9 groups of impacted lower third molars utilizing the various levels of impaction and their relationship with the ramus. This classification does not consider the angulation of impacted teeth<sup>3</sup>. Winters classified impacted lower third molars according to their axial angulation such as mesioangular, vertical, distoangular and horizontal<sup>4</sup>. Pederson's index makes use of both the classifications of Winters and Pell and Gregory to determine the surgical extraction difficulty. However, these classifications aren't the only reliable sources for determining the difficulty of the extraction procedure because there are other factors such as age, body mass index, root morphology, bone quality, and tooth proximity to the mandibular canal that can affect as well<sup>5</sup>.

Complications related to mandibular third molar extraction can be classified into intraoperative and postoperative complications. Intraoperative complications include mandibular fracture, damage of adjacent teeth, tooth or tooth fragments displacement into soft tissues and severe bleeding during extraction<sup>6</sup>. In cases where excessive intraoral force was applied and part of bone was removed, risk of mandibular fracture and damage of adjacent teeth is increased. Improper operation technique can lead to displacement of tooth or tooth fragments during the surgery<sup>7</sup>.

The most unpleasant iatrogenic complication that arises from third molar impaction surgery is inferior alveolar injury leading to disturbances in the neurosensory function. The incidence of inferior alveolar nerve injury varies from 0.81% to 22% of the cases according to different authors. 1% to 4% of patients are at the risk of permanent injury due to the surgery<sup>8</sup>. Lingual nerve injury incidence was reported between 0.4% and 25% of the patients. Inferior alveolar nerve injury paresthesia to complete numbness and pain in the region of lower lip, mucous membranes, and the gingiva as far posteriorly as the second premolar<sup>9,10</sup>. Previously our team has done many researches, systematic reviews and surveys which has led to the idea of the current topic on impaction removal<sup>11-25</sup>. The aim of this study is to analyse the male and female ratio on the removal of impacted teeth in saveetha dental college and to know the gender predominance of impaction removal.

## **MATERIALS AND METHODS:**

### **Sampling:**

Non-probability sampling was collected from June 2019 to March 2020. The case sheets of the patients above 18 years of age who had reported to Saveetha Dental college for removal of impacted teeth were reviewed. The data was verified using the DIAS software to prevent sampling bias. The external validity was good, as it is generalisable among patients of the same ethnic origins within the state and country.

### **Ethical approval**

Ethical approval was obtained from the Institutional Ethical Committee and scientific review board [SRB] of Saveetha Dental College. SDC/SIHEC/2020/DIAS/DATA/0619-0320

### **Data collection:**

The data was obtained from the dental information archiving software - DIAS, patient management software. The data collected included parameters such as the patient's name, age, gender and diagnosis. Patient data obtained was cross verified with the DIAS treatment photographs. The data was collected and tabulated in the excel sheet and imported to spss software for statistical analysis.

### **Statistical analysis:**

The data was imported to spss software by IBM version 25.0 for Windows OS in which the output variables were defined. The independent variables were age and gender whereas the dependent variables were the impacted teeth removed and the statistical mean value obtained. The statistical test used was correlation test to establish the results.

### **Methodology**

The data was imported to spss software by IBM version 25.0 for Windows OS in which the output variables were defined. The independent variables were age and gender whereas the dependent variables were the number of cases with impaction removal and the statistical mean value obtained for the prevalence. The study patients diagnosed with impaction removal were collected from DIAS records and statistical tests were performed to obtain the results.

## RESULTS AND DISCUSSION:

From the study, it can be estimated that among 760 patients who have undergone impaction removal procedure, among which the number of male patients were 436 and the number of female patients were 324. The male female ratio was 1.3:1 (male: female). Predominant gender with maximum number of impaction removals was male. To estimate the predominant age group of impaction removal, patients were divided into 3 age groups. Group 1 includes 18-30 years with 502 patients, group 2 includes 31-45 years with 222 patients and group 3 includes 46-70 years of age with 36 patients. From the study, it was estimated that impaction removal was commonly undergone by group 1 patients i.e. 18-30 years of age. From the statistical test, it can be estimated that figure-I indicates the distribution of study population based on age wherein 66% of patients belonged to group-1 with highest frequency and 5% of patients belonged to group-3 with a lowest frequency. Figure-II indicates the distribution of the study population based on gender, wherein 57% of the patients were males with the highest frequency and 43% were females with the lowest frequency.

Previous study by Passi D et al had a male female ratio of 1.5:1 thus indicating male predominance which coincides with the study<sup>26</sup>. Other studies by Hashemipour et.al proved the incidence of impacted third molars in male (65%) thus coinciding with the study<sup>27</sup>. Another study by Rajasuo A et al, compares the removal of impacted teeth among young men with a male population of 45% more than the female population<sup>28</sup>. Akadiri and Obiechina in their study demonstrated that the depth angulation and root morphology of the impacted tooth are the most consistent determinants of extraction difficulty<sup>29</sup>.

Previous studies on the same area of interest also had a female predominance than male, wherein the male:female ratio was 1:1.3 which is not coinciding with this study<sup>30</sup>. The most common types of impaction include mesioangular, distoangular, horizontal, vertical. The commonest signs and symptoms of impaction are pain, soreness, gingivitis, and food lodgement. The common complications include periodontal disease, pericoronitis, dental caries. The removal of impacted teeth is done through surgical extraction or trans-alveolar extraction. The study gives us a broad idea on Impaction, each type of classification and its difficulties and also on the management in a minimally traumatic way in order to prevent postoperative complications.

In recent studies, tooth position, morphology, adjacent bone, age and gender of the patients were considered to be the factors determining the difficulty of extraction. Few studies also indicated that the most common age group that underwent extraction is from 18-35 years of age<sup>31</sup>. A study by Otasowie D, Osunde et al discussed the level of pain and trismus, post extraction does not change in different age groups. In other studies, it had been indicated that the wisdom tooth's depth and angulation served to be major factors for determining the level of difficulty of extraction<sup>32</sup>. According to Elsey and Rock, impaction of third molars is common in about 73% of young adults. Generally the age for the eruption of the mandibular 3rd molars is 3-6 months late, in males, when compared to females<sup>33</sup>. Historically dental extractions were carried out by a variety of methods before the advent of antibiotics. In spite of the newer advancements in instrumentation and techniques of tooth removal, the postoperative complications are not uncommon. One of the most common complications is a dry socket which does not heal within the anticipated healing time<sup>34</sup>.

A study by Silver-Stein P determined that smoking is one of the main adverse effects that leads to delayed wound healing<sup>35</sup>. A study by Johnson et al had demonstrated the atraumatic modality of treatment for the impaction removal. Dental purpose lasers selectively cause genetic disintegration of the cells in the tissue thereby leading to minimal trauma and almost no bleeding and pain<sup>36</sup>. In our study the bar graph represents the correlation between the number of patients who have undergone extraction and the predominant age group. A study by Bui CH et al discussed the complications following impaction surgery wherein males were the predominant gender group undergoing impaction removal<sup>37</sup>. This study coincides with our study. Another study by Tenbosch JJ et al, also discussed the gender predominance of impaction removal in which males undergo maximum impaction removal thereby coinciding with our study<sup>38</sup>. Studies have also discussed the complications of such difficult extraction procedures, precautions to be taken while doing extraction for patients with high blood pressure and the need to prescribe patients with postoperative antibiotics<sup>39</sup>. Studies by other authors have also discussed postoperative bleeding to be the most common complication of difficult extraction procedures. Following the surgical extraction, it is necessary for a surgeon to make the patients aware of the postoperative complications and it is important for the patient to have sufficient knowledge regarding proper oral hygiene maintenance<sup>40</sup>.

## LIMITATIONS:

The data may have discrepancies since the study is retrospective. It is limited to impaction removal confined to a specific geographic location and does not include any other criteria other than age and gender groups.

## FUTURE SCOPE:

This study gives a vast idea on impaction, their difficulties and postoperative complications. It also gives a broad idea on the management of these procedures in a minimally traumatic and effective way, thereby preventing postoperative complications.

## CONCLUSION:

Awareness on Impacted tooth removal and its complications and need for treatment has to be insisted on among young adults. Performing oral screening to diagnose impacted teeth at the earliest can be done to take necessary steps to treat the condition and also to save the adjacent tooth structure. Patients must be instructed on proper oral hygiene maintenance to prevent post operative pain and complications following impaction removal

**Author Contributions:**

First author [Nivesh Krishna R] performed analysis, interpretation and wrote the manuscript. Second author [Dr. Bala Krishnan] contributed to conception, data designs, analysis, interpretation and critically revised the manuscript. Third author [Dr. Arvind S] participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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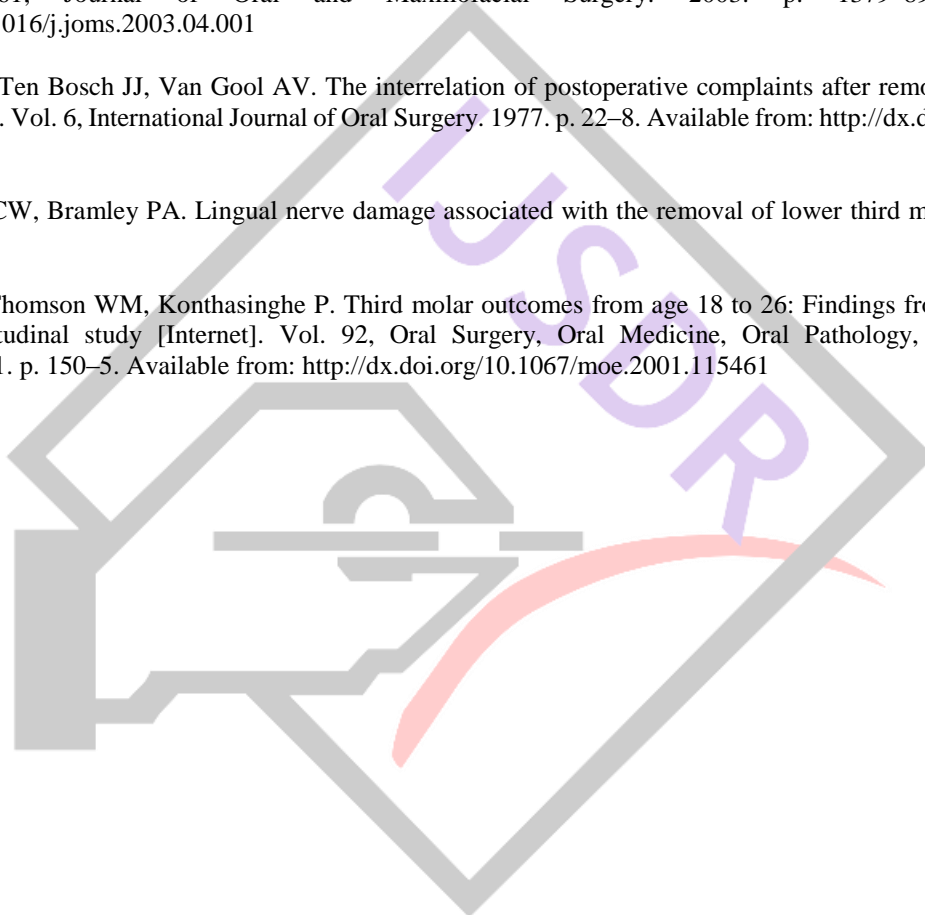
**Conflict Of Interest:** Nil.

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## FIGURES:

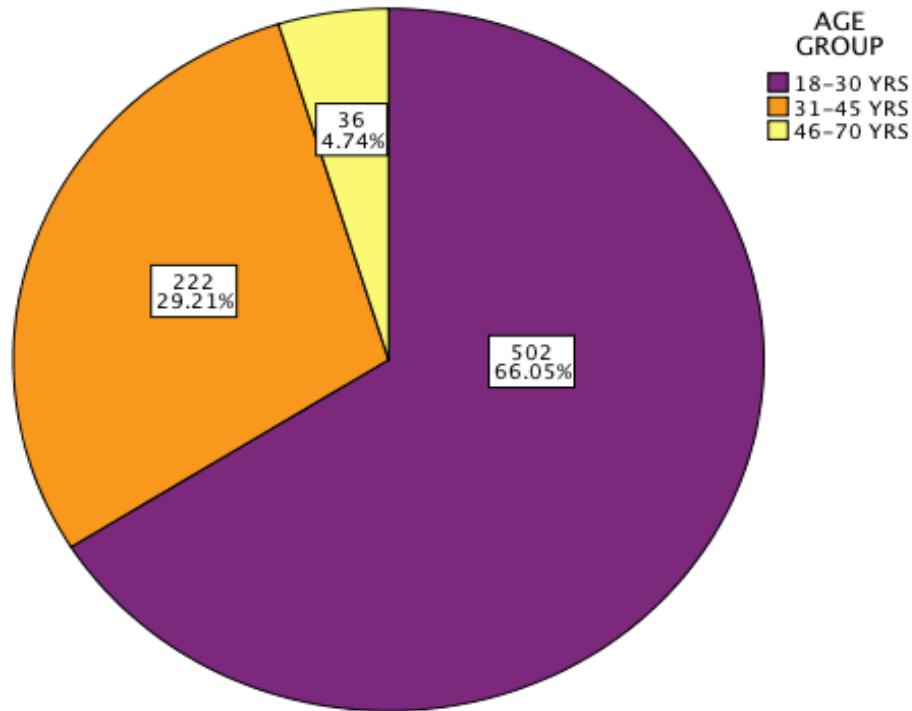


Figure 1 pie chart showing the distribution of the patients across the three age groups. Considering the age groups, group-1(18-30 years) includes 502 patients, group-2 (31-45 years) includes 222 patients and group-3 (46-70 years) includes 36 patients. The predominant age group with the highest impaction removal cases is 18-30 years i.e. group-1.

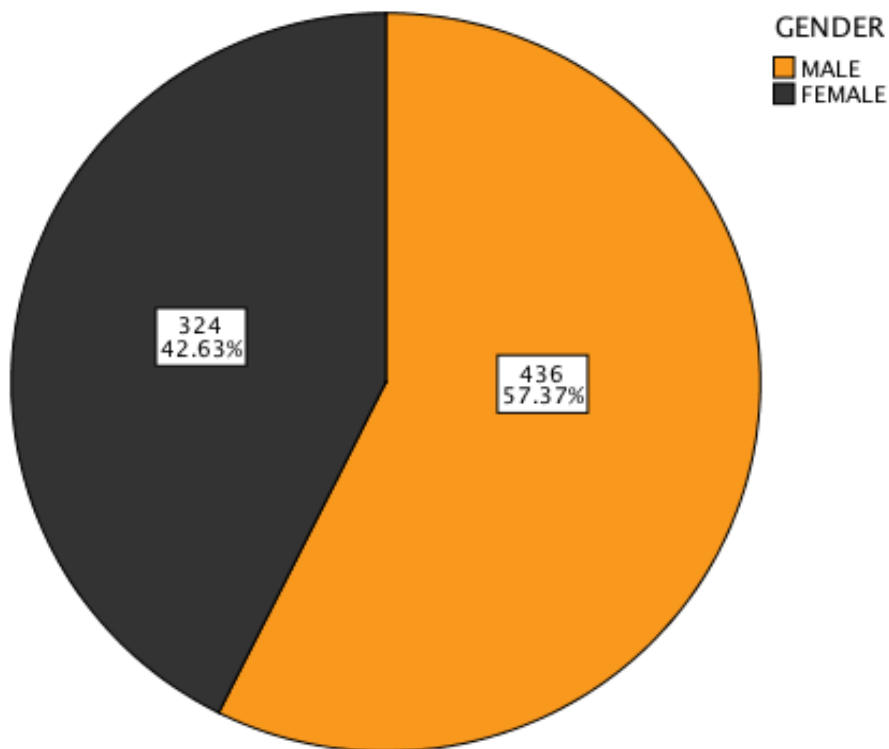


Figure 2 pie chart showing the distribution of the patients based on gender. From the study it can be estimated that among 760 patients who have undergone impaction removal, the number of male patients were 436 and the number of female patients were 324. The predominant gender was males with the highest frequency.



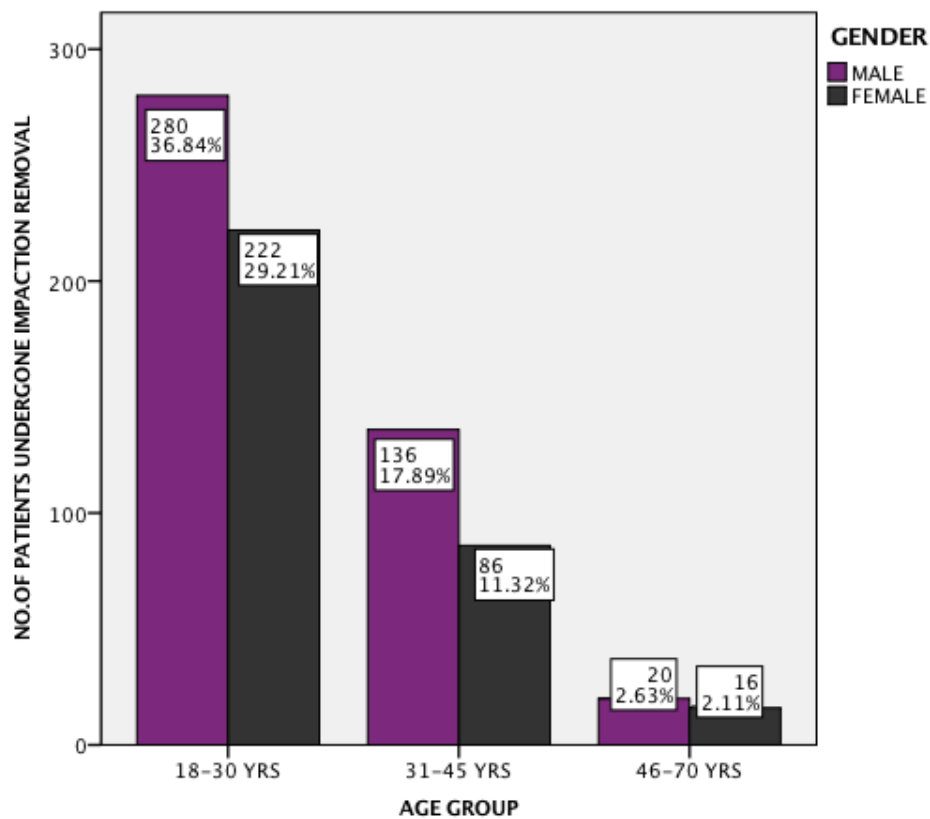


Figure 3: Bar graph showing the association between age group and gender prevalence of impaction removal. X axis represents the age group and Y axis represents the number of patients. Male female ratio of impaction removal cases was 1.3:1 thus indicating that males had undergone higher numbers of impaction removal than females.