SURGICAL REMOVAL OF THIRD MOLARS AND POSTOPERATIVE COMPLICATIONS – AN INSTITUTIONAL STUDY

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ABSTRACT

Third molar extraction without doubt remains one of the most ubiquitous procedures performed by oral and maxillofacial surgeons, and most third molar surgeries are performed without intraoperative or postoperative difficulties. Predictability helps in rightly predicting, eliminating and treating impactions that arise in the oral cavity. The aim of this study is to determine the frequency of impacted third molars that need surgical removal and the postoperative complications encountered. This is a single centre retrospective study done from June 2019 – March 2020. 701 patients who underwent surgical removal of their impacted teeth were considered. The parameters examined and processed with relevance to impacted third molar teeth were type of impaction based on Winter’s classification, age and gender of patient, the presence or absence of post-operative complications, and type of complications. IBM SPSS Version 20 was used for statistical analysis. Out of a total of 701 patients considered with impacted third molar requiring surgical removal, the most common type of impaction was mesioangular.
(43.2%). Out of the total 701 patients, 682 patients showed no signs of post-operative complications. However, 19 patients accounting for 2.7% of the considered patients showed signs of post-operative complications out of which 47.4% accounted with alveolar osteitis, 26.3% had trismus, 15.8% of patients had lingual nerve paresthesia, and 10.6% had swelling and ulceration. This study concludes to establish the predominance of third molar impactions that arise in the age group of 21-30 years with a gender predilection to males over females. The most common impacted tooth was mesioangular with definitive association to alveolar osteitis as postoperative complication and distoangular impaction to swelling and trismus.

Keywords: Third molar extraction; impaction; complication of third molar extraction


INTRODUCTION:

Impaction is defined as an organ or structure which because of an abnormal mechanical condition has been prevented from assuming its normal position. It’s a tooth which is completely or partially interrupted and is positioned against another tooth or bone or soft tissue so that its further eruption is unlikely (Archer et al, 1975). Impacted teeth are the most clinically relevant and common cases in Oral and Maxillofacial Surgery. Out of many teeth, third molars are the most common of all teeth to be surgically removed from the oral cavity.

Third molar extraction without doubt remains one of the most ubiquitous procedures performed by oral and maxillofacial surgeons, and most third molar surgeries are performed without intraoperative or postoperative difficulties. (1) Clinicians are often confused due to the lack of statistical evidence on third molar impaction because of specific indications, benefit-risk ratios and timing for the procedures are estimated only by clinical impressions and statistically proven clinical findings. (2) Till date, the institutional team of research has conducted several clinical trials, (3–8) in-vitro studies (9), and awareness surveys (9–17) in the field of Oral and Maxillofacial Surgery. Hence, a retrospective epidemiological setup is used for this study in order to highlight the differences in trends among the population.

This study was conducted to determine the prevalence of various types of third molar impactions and their relationship to the complications that arise post operatively among patients who have undergone surgical removal of impacted teeth. It also aims at establishing their association to age group and gender predilection.

MATERIALS AND METHODS:

Clinical records of patients who underwent surgical removal of third molars from the Department of Oral and Maxillofacial Surgery, between June 2019 and April 2020 were retrieved for this study. Radiographs and clinical
records were comparatively evaluated in this study. Institutional ethical clearance was obtained for data retrieval and usage as needed for the study (SDC/SIHEC/2020/DIASDATA/0619-0320)

A total of 784 patients were examined with photographic and radiological cross verification of data for the elimination of errors which could’ve aroused in the course of the study. Patients who underwent surgical removal of impacted teeth with preference to the availability of data of age, gender, availability of radiographs (IOPA/OPG), type of impaction (According to winter’s Classification) and follow up reviews were considered in the study. Inclusion of all available data with no sorting process has helped minimize sampling bias and stating applicable validity to the study.

Data was collected from the patient information archives. Patient data with absence of specified tooth, winters classification, radiograph and follow up review notes along with simple extractions were excluded from the study.

Out of a total of 784 patients considered for the study, 83 patients were excluded based on the exclusion criterion. A total of 701 patients were considered in this study. All surgical removal procedures were done with standard surgical protocol and prophylactic antibiotic and analgesic treatment modalities. Data were collected and verified by an external examiner and the statistical evaluation was done using IBM SPSS version 20.

With the dependent variables being age, complications and gender and Independent variable being the impacted tooth, the statistical correlation ‘chi-square’ test was used to obtain the analysis of association in consideration. All results underwent statistical analysis at a confidence interval of 95%.

RESULTS AND DISCUSSION:

Out of a total of 784 patients considered, 83 samples were excluded from the study as 16 patients did not have a radiograph for evaluation, 43 patients had impactions other than third molars and 24 patients failed to turn up for post-operative follow up and review. Out of the considered 701 samples, according to age, 397 (56.2%) belonged to the age group of 21-30 years, 169 (24.1%) belonged to the age group of 31-40 years, 76 (10.8%) in the age group of 11-20 years, 50 (7.1%) in the age group of 41-50 years and 12 (1.7%) belong to the age group of 51-60 years. [Figure 1]

In consideration of the gender, out of the total 701 patients included in the study, 401 patients (57.2%) were male whereas 300 patients (42.8%) were female. On evaluation of the tooth and arch of predominance, only 60 cases showed with impaction of maxillary tooth with 34 cases of the right side and 26 cases on the left side respectively together accounting for 8.6% of the total impacted teeth. A total of 641 cases fell under impacted mandibular teeth according to which 351 cases on the left side and 290 cases for the right-side accounting for 91.5% of the total impacted cases.[Figure 2]
According to the Winter’s Classification of third molar impaction, 303 cases of 701 total cases (43.2%) were mesioangular, 223 cases (31.8%) were horizontal, 99 cases (14.1%) were distoangular followed by 76 cases (10.8%) of vertical impactions were recorded. [Figure 3]

Post-operative complications of impactions removed surgically are of many. Out of a total 701 cases, 682 patients (97.3%) showed no signs of postoperative complications. However, 19 patients, accounting for 2.7% of the considered patients showed signs of post-operative complications out of which 47.4% accounted with alveolar osteitis, 26.3% had trismus, 15.8% of patients had lingual nerve paresthesia, and 10.6% had swelling and ulceration. [Figure 4]

On evaluating the association of post-operative complications to the types of impaction according to Winters Classification, 55.6% of mesio-angular impacted teeth showed the presence of alveolar osteitis post operatively followed by horizontal impacted teeth accounting for 33.3%. Trismus and swelling developed in 31.6% of patients who have undergone surgical removal of impacted third molars with disto-angular impaction accounting for 66.6% of these. Most postoperative complications were seen in mesio angular form of impaction which was of clinical significance, though not statistically significant, p= 0.293 > 0.05 by Chi square test. [Figure 5]

Impaction of teeth is defined as failure in eruption within the expected time by Peterson et al. (18) In this present study, impacted third molar has proved to be most common to the age group of 21-30 years. Extensive studies have proved to be in sync with the results obtained in this study. (19)(20) However, other studies have also reported age groups of 31-40 years as most common for impacted third molar. (21,22) Many local and systemic factors lead to the impaction of teeth.

Many theories and studies have stated that females have a higher predilection to impacted third molar over males. The reduced retromolar space in female population is one accepted factor for female predilection concluding the prevalence of female over male in presence of impacted third molar. (19,21) However, other studies in definitive concordance with our result have proved to have a higher predilection of male impacted molar cases over females. (2,20)

Winters classification of impacted third molars proves to be a universal yet valid reproducible scale for the identification of third molar impactions. This study has proved to have higher cases of mesio angular impacted cases followed by horizontal type of impaction. Kumar et al in his study has supported stated in correlation with our result of mesio angular impactions being predominant than other types of impactions of third molars. (19) Ryalat et al and Yilmaz et al have proved else that vertical type of impaction is more common in third molar impaction of age above 20 years. (19,21,23) However in younger patients of age less than 20, horizontal impaction of third molars are the most common. (23)

The four most common postoperative complication reported in literature after a surgical removal of impacted third molar are alveolitisosteitis, trismus, infection and paresthesia. (20) Frequency of reported cases of alveolitisosteitis...
ranges from 1% to 3% for all extractions exclusive to third molars, but was as high as 30% in cases of impacted mandibular third molars. (24,25) Consistent with previous studies, alveolitisosteitis was the most common complication of surgical removal of impacted third molars in this study. 47.4% of all accounted complications that arose in this study were of alveolitisosteitis. This rate is slightly higher than the cited range of previous studies. However we have stated in accordance with other studies proven earlier that mesio angular type of impaction shows more prevalence in development of alveolitisosteitis post operatively. (25)

Trismus, commonly referred to as “lockjaw” refers to the restriction of the range of motion of the jaw. It stems from a sustained, tetanic spasm of the muscles of mastication. (26) Trismus is a condition associated with or following surgical extraction of impacted third molar. (27) Our findings have proved that 26.3% of complications post-operative were due to trismus. Distoangular type of impaction showed more correlation in our study to the development of postoperative trismus. Balakrishnan et al has also stated the proportional relation of trismus being a postoperative complication in distoangular impaction cases. (28)

Infection rates range according to earlier reports from 0.9% to 4.3%. (29,30) This study when comparing the postoperative complications, showed an infection rate with swelling and ulceration as 10.6% of the total complication. Chiapasco et al has reported a level of infection in sync with our result. (29,30) (31) however, Herpy et al has proved to bring higher rates of infection postoperatively. (31)

A major complication postoperatively from the surgical removal of impacted third molar tooth is the lingual nerve or inferior alveolar nerve damage. It results in a considerable amount of morbidity and litigation. Literature has evidently proved the prevalence of Inferior alveolar nerve injury ranging from 1.3% to 5.3%, and lingual nerve injury ranging from 0% to 23%. (31–37) This study showed among all postoperative complications, inferior alveolar nerve injury and lingual nerve injury rates as 0% and 15.8%, respectively.
Figure 1: Pie chart showing percentage of incidence of third molar impactions based on different age groups. Patients within age group 21-30 years showed the highest incidence.
Figure 2: Pie chart showing percentage of incidence of third molar impactions based on gender of the patient. Incidence in males was more than half of the study population.
Figure 3: Pie chart showing percentage of incidence of various types of third molar impactions based on Winter's classification of third molars. Most common type of impaction was mesioangular and least were distoangular and vertical.
Figure 4: Pie chart showing percentage of incidence of various types of complications post third molar disimpactions. Most common type of complications were dry socket (alveolar osteitis) and least swelling and ulceration.
Figure 5: Bar graph showing association between type of impaction and post surgical complications; where X axis denotes the complication and Y axis denotes the frequency percentage of complications. Mesioangular and horizontal impactions showed more association to alveolar osteitis whereas trismus and swelling was seen more for distoangular impactions. The associations were however not of statistical significance, with $p = 0.293 > 0.05$ by Chi square test.

CONCLUSION

This study concludes that post surgical complication following disimpactions can be predictable with the type of impaction. Alveolar osteitis was the most frequent post surgical complication associated with the most frequent type of impaction - mesioangular. Trismus and swelling as post surgical complication was seen more frequently in association with distoangular impactions.
ACKNOWLEDGEMENT

The authors express their sincere gratitude to Saveetha Dental College and Hospitals, Chennai for their relentless support in helping us carry out this study each step of the way.

AUTHORS CONTRIBUTION

Dr. Sam John Koshy carried out the retrospective study data retrieval, statistical analysis, sequence alignment and drafted the manuscript. Dr. Madhulaxmi M. conceived the study, participated in its design and coordination and helped draft the manuscript. Dr. Sivakumar M. helped coordinate the study and review the manuscript. All authors read and approved the final manuscript.

CONFLICTS OF INTEREST

There were no conflicts of interest as defined by the authors.

REFERENCE:


