



The assessment of need for suturing following maxillary third molar extractions

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ABSTRACT

Maxillary third molar extractions (MTME) are one of the most common procedures done in maxillofacial surgery. Nevertheless, there are general complications that arise with every surgery. In our study, we have aimed to understand why suturing had been done following MTME and to observe a predilection in age and gender. By attempting to do so, we may establish when suturing is required and if age and gender have a role to play. A retrospective cross-sectional study was conducted after reviewing and analysing the data from 86,000 patient records between June 2019 and March 2020. Patients with an established record of MTME were selected from the age group of (20-60) years. The females of the study population had a larger frequency for having undergone MTME (52.7%) compared to the males (47.3%) and lastly trans-genders (0.1%). The highest incidence of MTME was found in the age group of (31-40) years with 30.6% followed by (20-30) and (41-50) years with 26.9% each. (51-60) years had the least MTME done (15.6%). There was a higher incidence of extracted 28's than 18's (52.1% > 47.9%). The placement of a suture following exodontia is not always mandatory, but when a complication such as a maxillary tuberosity fracture arises, suturing must be done. It is imperative to be equipped with the knowledge on how to manage possible complications, because even simple exodontias can prove to have fatal outcomes. Thus, further studies must be done to confirm our findings and to test other geographical locations and ethnicities.

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INTRODUCTION

Exodontia is the removal of a tooth from the dental alveolus in the alveolar bone. A tooth may be removed from the oral cavity for a variety of reasons such as tooth decay, infection, periodontitis, pericoronitis, prosthetics, cosmetics and in the past for prophylaxis (Nice, 2000; APHA, 2008; Zadik *et al.*, 2008; Hollins, 2019). Molar teeth are the most frequently extracted teeth (Mosha and Lema, 1991) and the third molar is the most common molar extracted (Reich and Hiller, 1993) followed by premolars in recent years (Alesia *et al.*,

2013). Thus, third molar surgery is one of the most commonly performed procedures in maxillo-facial surgery units (Patturaja and Pradeep, 2016). Nevertheless, accurate planning and sound surgical skills are required as complications arise in general following any surgery (Packiri et al., 2017; Jain et al., 2019). The incidence of complications following third molar surgery ranges between 2.6% to 30.9% (Bui et al., 2003; Brauer et al., 2013). The spectrum of complications that could possibly occur range from expected post-operative pain and swelling to permanent nerve damage, mandibular fractures, maxillary tuberosity fractures, maxillofacial trauma, alveolar osteitis, life threatening infections and abscess formation (Jerjes et al., 2006; Kim et al., 2006; Christabel et al., 2016).

A suture is placed to hold body tissues together after an injury or a surgery and several studies have hinted that placing sutures increases post-operative pain (Rao and Kumar, 2018; Sweta et al., 2019) and swelling when opposed to leaving the extraction site sutureless (Hashemi et al., 2012). But sutures must be placed following surgical complications such as maxillary tuberosity fractures and mandibular fractures (Bertram et al., 2011). Third molar extractions are one of the most difficult teeth to extract, thus our study aims to highlight when and where suturing is needed and to pinpoint the age and gender in which maxillary third molar extractions are common in, such that we may better excel in our prophylactic, pre-operative anxiety (Kumar, 2017b), waste (Rahman and Kumar, 2017) and complication management standards (Patil et al., 2017; Kumar, 2017a).

MATERIALS AND METHODS

Study Design and Setting

This retrospective study examined the records of 86,000 patients who underwent treatment at Saveetha Dental College, Chennai during June 2019 to March 2020. Ethical approval was obtained from the Institutional Ethics Committee. The study population included patients who had undergone maxillary third molar extractions from the age of 20 years to 60 years. They were separated according to their sex, age and tooth number extracted and were checked for suture placements and complications. Mentally or physically disabled individuals were excluded from the study due to the difficulties in obtaining reviews.

Data Collection

The patient records of 86,000 patients who visited Saveetha Dental College from June 2019 to March 2020 were analysed and were used to iden-

tify 1836 patients in the hospital database who had undergone maxillary third molar extractions. Relevant data such as patient age, sex, tooth number extracted, complications and suture placement were recorded. Repeated patient records, incomplete entries and extractions with no history of reviews were excluded. The data obtained was then verified by an external reviewer.

Statistical Analysis

Data was recorded in Microsoft Excel 2016 (Microsoft Office 10) and was later exported to the Statistical Package for the Social Sciences for Windows. (Version 20.0, SPSS, Inc., Chicago, USA) and was subjected to statistical analysis.

RESULTS AND DISCUSSION

The final dataset consisted of 1836 patients, predominantly of South Indian origin who had undergone left, right or both maxillary third molar extractions. There was a clear female predilection with the females having undergone 52.7% of the extractions, followed by males (47.3%) and finally 0.1% of trans-genders as inferred from Figure 2. The most number of maxillary third molar extractions was seen in the age group of (31-40) years with 30.6% of all the total extractions, followed by the age groups of (20-30) years and (41-50) years with 26.9% of the extractions each and lastly, 15.6% of the extractions in the age group of (51-60) years. There was also a predominance of tooth number where upper left third molars (28) were more commonly extracted than upper right third molars (18) 52.1% > 47.9%. Sutures were placed only in 1.6% of the total cases to contain the complication of maxillary tuberosity fractures (1.6%).

The data for this retrospective study was based on residents of South Indian cities seeking treatment at Saveetha Dental College, Chennai, India. Currently there are no studies directly seeking to identify the same — to assess the need for suturing following maxillary third molar extractions (Kumar and Skena, 2016; Abhinav et al., 2019; Jesudasan et al., 2015). Since there was no filtration process involved, this study mostly remains free of bias in regard to the selection of patients – except for the exclusion of patients below the age of 20 years and above the age of 60 years, those with mental and physical disabilities and extractions left unreviewed which was classified as incomplete data. According to most studies, females are reported to have a higher incidence of third molar extractions when compared to males (Quek et al., 2003; Alsadat-Hashemipour et al., 2013; Nejat et al., 2014). This is in accordance to our findings, where 52.7% of the

total study population undergoing maxillary third molar extractions were females, followed by 47.3% of males and 0.1% of transgenders.

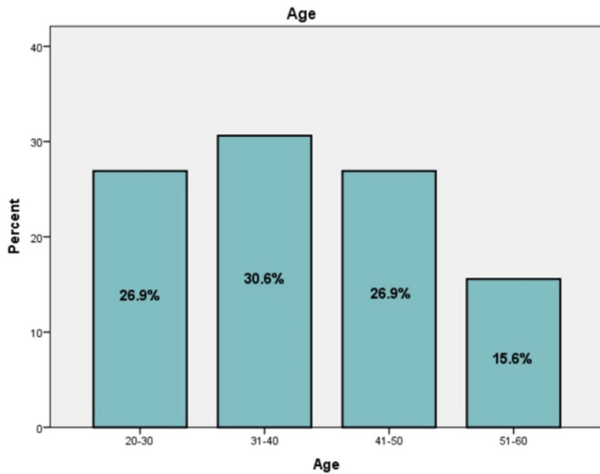


Figure 1: Frequency of extraction Distribution in different age groups

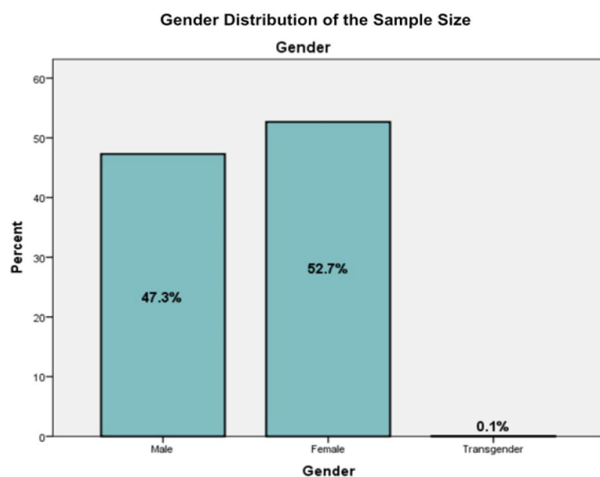


Figure 2: Gender distribution

In a study conducted by Marimuthu *et al.* (2018). They found a subject incidence of 57.3% of the study population to be females (Susarla and Dodson, 2005), which is comparable to our result of 52.7%. To identify the incidence of the highest number of maxillary third molar extractions with respect to age, the patients of our study population aged (20-60) years were divided into four smaller age subsets: (20-30) years, (31-40) years, (41-50) years and (51-60) years. As inferred from Figure 1, the highest incidence of maxillary third molar extractions was seen in the age group of (31-40) years with 30.6% of the total extractions, followed by the age groups of both (20-30) years and (41-50) years with 26.9% each and lastly by the age group of (51-60) years with 15.6% of the total extractions. This data suggests that maxillary third molar extractions are commonly undergone between the age of 31 years and

40 years.

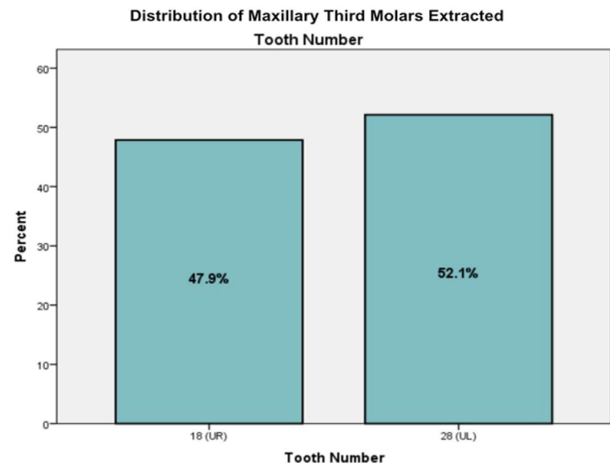


Figure 3: Frequency of distribution of the samples according to Tooth Number

This is inconsistent with a study performed by Sayed *et al.* (2019) where they concluded that (20-29) years is the most common age for third molar extractions. This contrast could be an attribute to the difference in number of individuals in each group in both the studies. But in this same study, they have suggested that the incidence of tuberosity fracture as a complication was 1.2% (Sayed *et al.*, 2019), which is in line with our finding of 1.6% for the same.

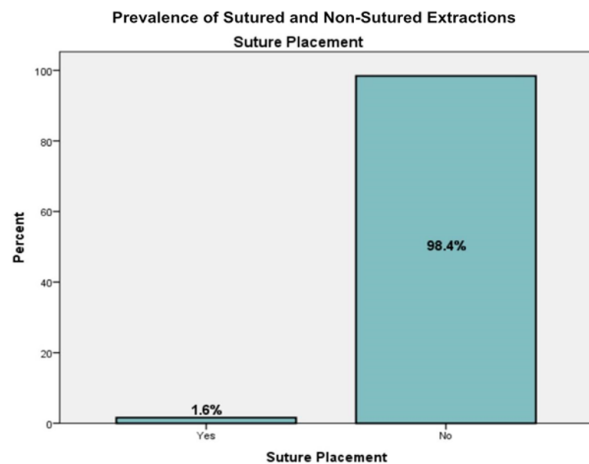


Figure 4: Frequency of distribution of samples requiring sutures placement

In another study by Kandasamy *et al.* (2009), they suggest that the incidence of fracture during third molar removal alone is 0.6% (Kandasamy *et al.*, 2009), which is also in line with our results. The fracture of the maxillary tuberosity, an important retentive area for maxillary complete dentures (Venkateshwar *et al.*, 2011), can even result - on rare occasions - in torrential haemorrhage due to its close proximity with significant blood vessels and other life-threatening complications (Bertram *et al.*,

Table 1: Cross tabulation between suture placement and complications

Count		Complications		Total	P Value
		Tuberosity Fracture	Nil		
Suture Placement	Yes	29	0	29	0.000
	No	0	1807	1807	
Total		29	1807	1836	

2011).

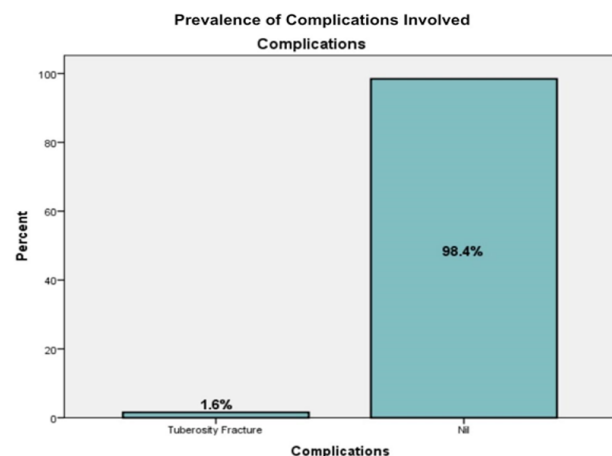


Figure 5: Distribution of samples based on Complications involved

In our study population, 1.6% of the total extractions were sutured because the same 1.6% of the cases had maxillary tuberosity fractures as complications of exodontia. The remaining 98.4% were left unsutured because of the absence of complications. When comparing the incidence of extractions between the right (18) and left (28) maxillary third molars, 28 seemed to be more frequently extracted (52.1%) when compared to 18 (47.9%). Thus, our results pointed to a female predilection with a commonly affected age group of (31-40) years with 28 being more frequently extracted than 18 and maxillary tuberosity fractures (complications) caused the need for suturing following maxillary third molar extractions (Marimuthu *et al.*, 2018; Kumar and Rahman, 2017).

Figure 1, Bar chart showing the frequency of extraction distribution among different age groups where the statistically significant incidence of maxillary third molar extractions is the highest in the age of (31-40) years and lowest in the age of (51-60) years across the scale of percentage study population in the 'y' axis and age in the 'x' axis. (Chi Square Test, $p < 0.05$)

Figure 2, Bar chart showing the frequency of third molar extractions according to gender with a statistically significant female predilection of 52.7%

across the scale of percentage study population in the 'y' axis and gender in the 'x' axis. (Chi Square Test, $p < 0.05$).

Figure 3, Bar chart showing the distribution of involved tooth number - 18 & 28 with a statistically significant predilection towards 28 over 18 across the scale of percentage study population in the 'y' axis and tooth number in the 'x' axis. (Chi Square Test, $p < 0.05$).

Figure 4, Bar chart showing the frequency of the population requiring suture placement statistically significant across the scale of percentage study population in the 'y' axis and the placement of a suture in the 'x' axis. (Chi Square Test, $p < 0.05$).

Figure 5, Bar chart showing the distribution of complications involved statistically significant with 1.6% being maxillary tuberosity fractures across the scale of percentage study population in the 'y' axis and complications in the 'x' axis. (Chi Square Test, $p < 0.05$).

Table 1 showing the cross tabulation between suture placement and complications statistically significant with $p = 0.000$ (Chi Square Test, $p < 0.05$)

CONCLUSION

Within the limits of our study, there is a need for suturing only when complications such as maxillary tuberosity fractures are present, otherwise it is acceptable for it to even remain suture less, with better prognosis, in fact. This is assuming that the individual undergoing the exodontia is not systemically compromised or prone to secondary health problems. Since the study does pose with certain limitations such as geographical barriers that lower the study's generalizability, further research must be done while actively trying to nullify said limitations.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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