ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

Post-Operative Complications Associated with Impacted Mandibular Third Molar Removal

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Submitted for Publication: 26-04-2023
Accepted for Publication 01-09-2023

How to Cite: Kalsoom F, Hassan L, Khan UQ, Soomro H, Siddique S, Nawadat K. Post-Operative Complications Associated with Impacted Mandibular Third Molar Removal. APMC 2023;17(3):340-343. **DOI: 10.29054/APMC/2023.1390**

ABSTRACT

Background: The extraction of the third molar is a commonly done treatment that is often accompanied by a diverse range of difficulties. The problems most frequently observed are discomfort, paresthesia, trismus, edema, and mandibular fractures. **Objective:** To determine the post-operative complications associated with impacted mandibular third molar removal. **Study Design:** Cross sectional study. **Settings:** Department of Oral Pathology, Frontier Medical and Dental College, Abbottabad Pakistan. **Duration:** September 2022 to February 2023. **Methods:** The study involved cross-sectional analysis of all surgical removals of third molars. The analysis encompassed postoperative complications such as bleeding, trismus, or edema, along with demographic characteristics and the type of impaction. The collected data was organized into a tabular format and analyzed using SPSS software. Statistical significance was defined as a P-value of less than 0.05." **Results:** There were 133 females (59.1%) and 92 males (40.9%) in the study. In terms of age distribution, the majority of patients (60.0%) were in the 21–30 age group. Regarding retention type, advanced cases were accounted for the majority at 75.6%, simple cases at 21.8%, and complex cases at 2.7%. Among the cases, 34.7% were categorized as minimally difficult (scores 3 to 4), 57.3% fell into the moderately difficult category (scores 5 to 6), and 8.0% were classified as very difficult cases (scores 7 to 10). The data indicates that there were 129 cases of pain, accounting for 57.3% of the total complications. Paresthesia occurred in 17 cases, representing 7.6% of the complications. Mandibular fracture was rare, with only one case, making up 0.4% of the complications. Alveolar osteitis was reported in 28 cases, comprising 12.4% of the total complications. Bleeding occurred in 5 cases, accounting for 2.2% of the complications. **Conclusion:** The most frequently observed complication was pain, with swelling and trismus following as the next most common.

Keywords: *Paresthesia, Pain, Trismus, Swelling, Complication, Bleeding.*

INTRODUCTION

Impacted teeth refer to a dental condition in which a tooth is unable to emerge into its designated location. The volcanic eruption may have occurred either in its whole or to some extent. The extraction of mandibular third molars, which are commonly impacted, has consistently been a primary focus for oral surgeons.[1] Typically, under ordinary circumstances, the eruption of this phenomenon occurs during the age range of 16 to 24 years. The mandibular and maxillary third molars are frequently affected, with the upper canine being the next most commonly impacted tooth. These impacted teeth often go unnoticed due to their typical lack of symptoms.[2,3]

Third molar impaction can be attributed to local factors such as dental crowding or the presence of supernumerary teeth. Additionally, it may be associated with various pathological conditions.[4,5] The discussion among clinicians over the surgical extraction of symptom-free or pathology-free impacted third molars as a prophylactic measure has persisted for an extended period. Over the past few decades, there has been a

growing body of research indicating a higher occurrence of periodontal deterioration and other oral health issues in the neighboring second molars when third molars are present or impacted.[6] This prevalence tends to increase as the patient's age advances. There have been recommendations to perform surgical extraction of impacted third molars that are asymptomatic and free of pathology before the onset of any pathological conditions, taking advantage of the ideal post-surgical healing period and minimizing the risk of problems.[7]

Prior to any surgical interventions, it is imperative to ensure that patients are well informed of the advantages and disadvantages of the procedure, as well as the potential risks during the perioperative period and issues that may arise afterwards.[8] The surgical extraction of the internal limiting membrane (iLM3) frequently requires the performance of odontectomy. Dry socket, also known as alveolar osteitis, is a postoperative complication characterised by delayed healing and inflammation at the site of tooth extraction, resulting from the dislodgement or dissolution of the blood clot.[9,10]

Conducting a local study on post-operative complications in impacted mandibular third molar removal is essential because it allows us to validate findings in our specific patient population and healthcare context. Our research will contribute by uncovering any region-specific trends, demographics, or practices that may influence complication rates. This localized data will enable us to tailor surgical approaches and post-operative care strategies more effectively, improving patient outcomes in our region and bridging the gap between global and local knowledge. In essence, our study will enhance the precision and relevance of clinical practices for impacted molar removal.

METHODS

The present investigation was conducted as a cross-sectional retrospective study at Department of Oral Pathology, Frontier Medical and Dental College Abbottabad from September 2022 to February 2023. The study received ethical approval from the hospital's Ethics Committee. The primary data sources utilized in this study were the medical records of the patients, as well as panoramic pictures obtained by the researchers to provide further evidence for the diagnosis. The study sample consisted of 225 individuals who had previously undergone surgical extraction of impacted mandibular third molars utilizing local anesthesia and the split technique, employing a low-speed straight handpiece, throughout the specified time frame. Conversely, individuals who did not adhere to the postoperative evaluation schedule, lacked complete medical records, did not have X-rays of impacted teeth, and did not exhibit craniofacial anomalies, congenital anomalies, or accompanying syndromes were excluded from the study sample. The researchers conducted an analysis of patient data, specifically focusing on the first-day preoperative assessment and the seventh-day postoperative assessment. The purpose of this analysis was to identify any postoperative complications experienced by the patients, including persistent pain, swelling, trismus, and paresthesia. Additionally, the researchers examined how these complications were influenced by patient characteristics, such as age and sex, as well as the level of surgical difficulty. The rates of postoperative pain were assessed via the visual analogue scale (VAS). The measuring of edoema through the comparison of preoperative and postoperative measurements using a ruler. The assessment of trismus involved the quantification of the greatest interincisal opening. The classification of the surgical complexity of extracting impacted mandibular third molars was determined by Sailer and Pajarola, taking into consideration the kind of retention.

We employed Statistical Package for Social Sciences (SPSS) version 23.0 for data analysis. For quantitative variables such as age, post-operative pain score, and swelling, we expressed the results as mean ± Standard Deviation (SD). Qualitative variables, like gender, were represented in terms of frequency and percentage. The descriptive data were subjected to analysis using the Chi-Square test and to assess the differences between the two groups, we utilized an independent sample t-test, with a significance threshold set at ≤0.05.

RESULTS

There were 133 females (59.1%) and 92 males (40.9%) in the study. In terms of age distribution, the majority of patients (60.0%) were in the 21–30 age group, while other age groups had fewer representations. Angulation analysis showed that mesioangular cases were the most prevalent at 43.1%, followed by horizontal at 30.2%, while buccoversion was the least common at 0.4%. Regarding retention type, advanced cases accounted for the majority at 75.6%, simple cases at 21.8%, and complex cases at 2.7% given in table 1.

The table 2 presents the difficulty index categories for the patients. Among the cases, 34.7% were categorized as minimally difficult (scores 3 to 4), 57.3% fell into the moderately difficult category (scores 5 to 6), and 8.0% were classified as very difficult cases (scores 7 to 10).

The data indicates that there were 129 cases of pain, accounting for 57.3% of the total complications. Paresthesia occurred in 17 cases, representing 7.6% of the complications. Mandibular fracture was rare, with only one case, making up 0.4% of the complications. Alveolar osteitis was reported in 28 cases, comprising 12.4% of the

total complications. Trismus was reported in 55 cases, making up 24.4% of the complications given in table 3.

Table 1: Age, sex and angulation distribution of patients

Variables	Variable	Total (%)
Gender	Female	133 (59.1%)
	Male	92 (40.9%)
Age	11–20	41 (18.2%)
	21–30	135 (60.0%)
	31–40	33 (14.7%)
	41–50	10 (4.4%)
	51–60	4 (1.8%)
	61–70	2 (0.9%)
Angulation	Vertical	49 (21.8%)
	Mesioangular	97 (43.1%)
	Distoangular	10 (4.4%)
	Horizontal	68 (30.2%)
	Buccoversion	1 (0.4%)
	Distoversion	0 (0%)
	Inverted	0 (0%)
Retention type	Simple	49 (21.8%)
	Advanced	170 (75.6%)
	Complex	6 (2.7%)

Table 2: Difficulty Index categorization

Difficulty Index Categories	n	%
Minimally difficult (3 TO 4)	78	34.7%
Moderately difficult (5 TO 6)	129	57.3%
Very difficult (7 TO 10)	18	8.0%

Table 3: Third molar extraction the risk of complications

Complication	Incidence	Percentage
Pain	129	57.3%
Paresthesia	17	7.6%
Mandibular Fracture	1	0.4%
Alveolar Osteitis	28	12.4%
Bleeding	5	2.2%
Swelling	100	44.4%
Trismus	55	24.4%

The table 4 shows the association between complications and gender. Among males, 46.2% experienced swelling, 13.8% had trismus, 11.6% had paresthesia, 55.1% had pain, 6.66% had alveolar osteitis, 3.1% had bleeding, and 1.77% had mandibular fractures.

Table 4: The association between complications and gender

Complication	Male n (%)	Female n (%)
Swelling	104 (46.2)	121 (53.8)
Trismus	31 (13.8)	21 (9.3)
Paresthesia	26 (11.6)	36 (16)
Pain	124 (55.1)	114(50.6)
Alveolar Osteitis	15 (6.66)	21 (9.33)
Bleeding	7 (3.1)	13 (5.8)
Mandibular Fracture	4(1.77)	2(0.88)

The table 5 displays the distribution of complications based on angulation. Swelling was most common in horizontal cases (100.0%), while trismus was more frequent in horizontal (57.1%) and paresthesia in vertical (29.4%) cases. Pain had no occurrences.

Table 5: The association between complications and the angle of impaction

Complication	Mesioangular (%)	Horizontal (%)	Vertical (%)	Distoangular (%)
Swelling	115 (76.7)	7 (100.0)	10 (58.8)	43 (75.4)
Trismus	28 (18.7)	4 (57.1)	1 (5.9)	2 (3.5)
Paresthesia	21 (14.0)	1 (14.3)	5 (29.4)	9 (15.8)
Pain	(0)	0(0)	0(0)	0(0)
Alveolar Osteitis	3 (2.0)	1 (14.3)	0 (0.0)	1 (1.8)
Bleeding	9 (6.0)	2 (28.6)	1 (5.9)	4 (7.0)
Mandibular Fracture	2(1.9)	3(4.9)	5(7.11)	0(0)

DISCUSSION

According to recent research, short-term complications such as edoema, discomfort, and trismus can occur following an odontectomy due to the physiological inflammation resulting from tissue response to surgical manipulation and trauma. Despite being often occurring and manageable disorders, it is imperative for dentists to remain vigilant regarding any anomalies that could potentially result in postoperative infections or protracted difficulties.[11,12]

The study had a higher proportion of male patients (59.1%). A comparable study in the USA found 57% were males and Ayaz *et al* in Pakistan found (64.2%).[13,14] In contrast, studies in Pakistan by Khan *et al*. (2012), showed a higher prevalence of females.[15] A limited number of patients in the study were older than 40 years, which differs with the findings published by Khan A *et al*. (2012). This phenomenon could potentially be attributed to the extraction of the impacted mandibular third molar at a younger age.[15]

In this study, the prevailing angulation pattern was mesioangular impaction (43.1%), while distoangular impaction was the least prevalent (4.4%). These findings align closely with those reported by Ayaz *et al*. in 2012, where mesioangular impaction (42.5%) was the most frequent, and distoangular impaction (7.5%) was the least common.[14] Additionally, Jaffar *et al*. in another study found similar results, with mesioangular impaction (52.3%) being the most frequent and distoangular impaction (9.1%) being the least common.[16]

A study undertaken in the Nigerian population by Obiechina *et al*. (2005) yielded same findings, with a reported prevalence rate of 46.40%.[17] The data indicates that there were 129 cases of pain, accounting for 57.3% of the total complications. Paresthesia occurred in 17 cases, representing 7.6% of the complications. Mandibular fracture was rare, with only one case, making up 0.4% of the complications. Alveolar osteitis was reported in 28 cases, comprising 12.4% of the total complications. Bleeding occurred in 5 cases, accounting for 2.2% of the complications. Swelling was a common complication, with 100 cases, representing 44.4% of the total. Trismus was reported in 55 cases, making up 24.4% of the complications. According to a study conducted by Azam *et al* (2010), the prevalence of postoperative discomfort following third molar surgery was found to be 28%. Ayaz *et al*,[14] Prerana *et al* (2021)[19] and Rizqiawan *et al* (2022),[20] reported comparable findings. Certain authors regard them as temporary problems that are anticipated in surgical procedures.

CONCLUSION

The most frequently observed complication was pain, with swelling and trismus following as the next most common.

LIMITATIONS

One limitation of the study was its non-randomized nature, and the challenge of achieving standardization in assessment methods, given the subjective nature of clinical outcomes evaluation.

SUGGESTIONS / RECOMMENDATIONS

We should acknowledge the need for further research on this topic.

CONFLICT OF INTEREST / DISCLOSURE

None.

ACKNOWLEDGEMENTS

None.

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