

POST-OPERATIVE COMPLICATIONS ASSOCIATED WITH IMPACTED MANDIBULAR THIRD MOLAR REMOVAL

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ABSTRACT

The objective of this study was to evaluate the occurrence of post-operative complications after surgical removal of impacted mandibular third molar. This descriptive study was carried out at the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar. One hundred and six patients were included in this study. Detailed history was taken from each patient. Data were collected on a specifically designed proforma. The patients were re-evaluated on the third and seventh post-operative days. Post-operative complications recorded were based on history, clinical examination and radiographs when necessary. The data were analyzed using SPSS 17. The most common age group was the third decade (58.5%). Mesioangular (42.5%) and class 1A (43.4%) were the most common pattern. The most common post-operative complications were swelling (92.5%), pain (88.6%) and trismus (81.1%) followed by nerve injury (6.6%), dry socket (3.8%) and infection (2.8%).

Key Words: Impacted mandibular third molars, post-operative complications, difficulty index.

INTRODUCTION

The mandibular third molars are the most frequently impacted teeth and surgical extraction has become one of the commonest dentoalveolar surgeries. This procedure is usually associated with post operative complications^{1,2} (14.2%) as direct and immediate consequence of surgical procedure.^{3,4} Pain, swelling and trismus are the most common complications, followed by sensory nerve damage, dry socket, infection and hemorrhage. Less common complications are severe trismus, iatrogenic damage to adjacent second molar and iatrogenic mandibular fracture.^{5,6}

Other factors include age, gender, medical history, presence of pericoronitis, poor oral hygiene, type of impaction, relationship of third molar with inferior alveolar nerve, surgical time and technique, surgeon's experience and the use of pre and post operative medications.^{7,8}

In surgical removal of lower third molars, proper pre operative planning and the blending of surgical technique with surgical principles is of paramount importance for decreasing the incidence of complications.⁷

The purpose of this study was to evaluate the incidence of post operative complications associated with the mandibular third molar impaction surgery in patients who came to the Oral and Maxillofacial Surgery Department of Khyber College of Dentistry, Peshawar.

METHODOLOGY

One hundred and six patients included in the study were referred from the Out Patient Department of Khyber College of Dentistry, Peshawar. Informed consent was obtained and detailed history was taken from each patient to exclude any systemic illness,

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followed by clinical and radiographic examination. The data were recorded on a specifically designed proforma. The degree of difficulty of extraction was determined by Pederson's Difficulty Index as follows:

- Minimally Difficult: 3 to 4
- Moderately Difficult: 5 to 6
- Very Difficult: 7 to 10

The surgical procedure was then planned accordingly. All procedures were carried out under local anesthesia. The patients were given appropriate post operative instructions. All patients were given the same antibiotics and analgesics. Each patient was re-evaluated on the third and seventh post-operative days. The post-operative complications were recorded based on history and clinical examination. Radiographs if necessary, were taken. Visual analog scale was used for pain, according to which pain was divided into three grades, mild (1-3), moderate (4-7) and severe (8-10). Swelling was analysed by comparing the two sides of the patient's face. Trismus was determined by checking the extent to which the patient could open his/her mouth. Patients were asked about any persistent numbness after the day of surgery. Intra-oral examination was then carried out for any other complication such as dry socket, infection or wound dehiscence.

The data were analyzed using Statistical Package for Social Sciences (SPSS) version 17.0.

RESULTS

One hundred and six patients were included in this study. Sixty eight patients were males (64.2%) and 38 patients were females (35.8%) having male to female ratio of 1.7 : 1. Their age ranged from 17 to 46 years with a mean of 26.01 ± 6.48 years. Majority of the patients were in their third decade (Table 1).

Mesioangular and Class IA impaction pattern were most common and distoangular and Class IIC were least common. No cases of Class IC and IIIC were found in this study.

Based on the difficulty index, majority of the impacted mandibular third molars (60.4%) were classified as moderately difficult and only 7.5% were very difficult (Table 2).

The most common post-operative complication was swelling (n=98, 92.5%), followed by pain (n=94, 88.6%) and restricted mouth opening (n=86, 81.1%). On the third post-operative day, 98 (92.5%) patients had swelling which subsided in 69 (65.1%) patients by the 7th post-operative day. Forty (37.7%) patients had mild pain on the 3rd post-operative day and 46 (43.4%) patients had no pain on the 7th post-operative day. Mouth opening was restricted in 86 (81.1%) patients on the 3rd post-operative day and it had returned to normal in 74 (69.8%) patients by the 7th day (Table 3). There were 6 cases (5.7%) of inferior alveolar nerve injury due to

TABLE 1: AGE DISTRIBUTION

| Age (years) | n | % |
|-------------|-----|------|
| 11-20 | 24 | 22.7 |
| 21-30 | 62 | 58.5 |
| 31-40 | 18 | 16.9 |
| 41-50 | 2 | 1.9 |
| Total | 106 | 100 |

TABLE 2: DIFFICULTY INDEX

| Difficulty Index Categories | n | % |
|--------------------------------|-----|------|
| (i) Minimally difficult 3 TO 4 | 37 | 34.9 |
| (ii) Moderately difficult 5 TO | 61 | 57.6 |
| (iii) Very difficult 7 TO 10 | 8 | 7.5 |
| Total | 106 | 100 |

TABLE 3: POST-OPERATIVE COMPLICATIONS (n=106)

| Complications | Third Day n(%) | Seventh Day n(%) |
|--------------------------|----------------|------------------|
| (A) Pain | | |
| (i) No pain | 12 (11.3) | 46 (43.4) |
| (ii) Mild | 40 (37.7) | 42 (39.6) |
| (iii) Moderate | 31 (29.3) | 14 (13.2) |
| (iv) Severe | 23 (21.7) | 4 (3.8) |
| (B) Swelling | | |
| (i) Present | 98 (92.5) | 37 (34.9) |
| (ii) Not present | 8 (7.5) | 69 (65.1) |
| (C) Mouth Opening | | |
| (i) Restricted | 86 (81.1) | 32 (30.2) |
| (ii) Normal | 20 (18.9) | 74 (69.8) |

the surgical procedure and one case of lingual nerve injury (0.9%). Dry socket was seen in 4 patients (3.8%). Least common complication was infection (n=3, 2.8%).

DISCUSSION

The failure of eruption of third molars is a very common condition^{3, 6-8} and the extraction of impacted third molar teeth is one of the most frequent surgical procedures carried out.⁹ The most frequent indication for removing impacted mandibular third molar in this study was caries followed by pericoronitis. Adeyemo et al¹⁰ also reported caries and its sequelae as the major reason of extraction, followed by pericoronitis and periodontitis. However, some local and international studies reported pericoronitis as the most common pathology associated with impacted mandibular third molar.^{11,12}

Majority of the patients in this study were males (64.2%). Similar study conducted in the USA found that 57% of the patients were males.⁸ However, studies carried out in Pakistan¹¹, Libya¹³, and Nigeria¹⁴ reported a predominance of the female gender.

58.5% of the patients in the request study were in their third decade. This correlates with studies conducted in Pakistan (57.4%)¹¹ and USA (mean age = 26.4 years).⁸ Very few patients were above the age of 40 years which is in contrast to the study results reported by Khan A et al.¹¹ This may be due to the removal of impacted mandibular third molar at an earlier age.

The predominant angulation pattern in this study was mesioangular impaction (42.5%) and the least common was distoangular impaction (7.5%). Similar results were documented by Jaffar et al¹² where mesioangular impaction (52.3%) was most frequent and distoangular impaction (9.1%) least common. Local and international studies conducted in Pakistan (48%)¹¹, Nigeria (48.2%)¹⁴, China (80%)¹⁵, Korea (46.5%)¹⁵ and Thailand¹⁶ also reported mesioangular as the most common pattern. However, a study conducted in Jordanian population found that vertical type (61.4%) was the most common and mesioangular impaction was only found in 18.1%.¹⁷ Similarly, studies in Barcelona (47.9%)¹⁸ and USA (63.9%)⁸ also reported vertical type as most common pattern.

Class IA (43.4%) position was the most common pattern in the present study similar to that reported by Bui et al⁸. However, Obiechina et al¹⁴ and Monaco et

al¹⁹ reported Class IIA as common pattern in Nigerian and Italian populations respectively. Class IIB was predominantly reported in Spanish population.¹⁸

Surgical removal of third molar is not risk free¹² and incidence of post-operative complications is related to the difficulty index.¹³ Persistent pain and swelling, infection, trismus, alveolar osteitis (dry socket), nerve damage, ulceration, bleeding, dentoalveolar fracture, displacement of tooth, adjacent tooth injury, temporomandibular joint injury, and possible fracture of the mandible are possible post-operative complications.^{6,20,21} Majority of the third molars in this study were categorized as moderately difficult to extract (n=61, 57.6%). Similar results were reported in a study conducted in Nigerian population (46.40%).¹⁴

The most common postoperative complications found in this study were swelling, pain and trismus. Similar results were reported by Khan et al¹¹ and Jaffar et al.¹² Some authors consider them as transient complications and are expected with surgery. Although transitory, these conditions can be a source of anxiety for the patient.²² Swelling was seen in 98 (92.5) patients, reaching to maximum on the 2nd and 3rd days postoperatively, and regress by the 4th day and completely resolves in 7 days.²² Pain caused by third molar surgery usually begins after the anesthesia subsides and reaches peak levels in 6 to 12 hours postoperatively.²² Forty (37.7%) patients reported mild pain on the third post-operative day and 46(43.4%) patients had no pain on the seventh post operative day. Mouth opening was limited in 86 (81.1%) patients. Trismus is often the result of surgical trauma, secondary to masticatory muscle and fascial inflammation.²² Trismus gradually resolves and the ability to open the mouth returns to normal by 7-10 days post operatively.²³ In this study, majority of the patients (n=74, 69.8%) had normal mouth opening by the seventh post-operative day.

The frequency of dry socket reported in the literature ranges from 0.3% to 26%.²¹ In this study dry socket was seen in only 4 (3.8%) patients. Similar results were reported by Khan et al (4.2%)¹¹ and Jaffar et al (5%).¹² However, Gbotolorun et al²⁴ documented that dry socket (53.2%) was the most common post-operative complication in patients treated at Lagos University teaching Hospital. Similarly, a study in the USA⁸ reported dry socket in 31.1% patients.

Nerve damage due to surgery may result in considerable morbidity. In this study the inferior alveolar nerve and lingual nerve injury rates were 5.7% and 0.9%, respectively. In the international literature, inferior alveolar nerve injury ranges from 1.3% to 5.3%, and lingual nerve injury ranges from 0% to 23%⁸, depending upon the difficulty index and relation of the nerve to the impacted third molar.

Reported infection rates range from 0.9% to 4.3%.⁸ In this study post-operative wound infection was seen in 3(2.8%) patients and wound dehiscence was seen in two patients. All patients were prescribed post-operative antibiotics which lead to a low infection rate. Similarly, low rates of infection were reported by Milani et al²¹ and Bui et al.⁸

Post-operative complications associated with impacted mandibular third molar have profound affect on the social life of the patient. A comprehensive pre-operative counseling of the patient is required. Patients having social engagement may require rescheduling.

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