



Complications of Surgical Extractions of Third Molars Done at the Tertiary Center of Kathmandu, Nepal

Desar B*, Shakya R and Sharma PB

Department of Oral and Maxillofacial Surgery, Patan Academy of Health Sciences, Lagankhel Nepal

***Corresponding author:** Bikash Desar, Assistant Professor, PAHS-Dental Department, Chief of Department, Lagankhel, Nepal, Tel: 9841261154; Email: desharbikash@yahoo.com

Received Date: December 07, 2020; **Published Date:** December 26, 2020

Abstract

Objectives: The main objective of this retrospective study is to find out the complications of surgical extraction of third molars under local Anesthesia performed at dental department.

Methods: Patients who went surgical extraction of one or more third molars under local anesthesia between 2017 to 2019 were included. Age, gender, indication for extraction, teeth removed, procedure and complications were recorded.

Results: A total of 4,220 third molars (91.94% mandibular and 8.85% maxillary) were extracted and the majorities (54.68.7%) were from male patients. The mean age at extraction was 29 ± 5 years and most patients (58.07%) were 25–34years old. The intraoperative and postoperative complication rates were 2.08% and 32.23%, respectively. The intraoperative complications included tuberosity fracture (0.78%), root fracture (0.41%), bleeding (0.26%), soft tissue injury (0.1%) and adjacent tooth damage (0.15%). Postoperative complications swelling/pain/trismus (31.77%) and dry socket (0.36%). A statistically significant relationship was observed between those aged 35–44 years and dry socket ($P = 0.010$) as well as bone removal and all postoperative complications ($P = 0.001$).

Conclusion: Most complications resulting from third molar extractions were minor and within the reported ranges in the scientific literature. However, increased age and bone removal were associated with a higher risk of complications. These findings may help to guide treatment planning, informed consent and patient education.

Keywords: Third Molar; Tooth Extraction; Complications

Abbreviations: IAN: Inferior Alveolar Nerve; LN: Lingual Nerve; LA: Local Anesthesia.

Introduction

Mandibular third molars are most commonly impacted teeth in comparison to upper third molars. These might fail to erupt in its normal functional position resulting into many difficulties [1]. To overcome difficulties the surgical

extractions of third molars is the most common surgical procedure performed by oral and maxillofacial surgeons all over the world. Most of the time there is no any serious complications but sometimes can result in complications ranging from 4.6 to 30.9% [2-6]. Complications may be intra-operative or post-operative. Intra-operative complications may be severe, injury to surrounding soft tissue, damage to adjacent tooth, restoration, bleeding from the socket, dislodgement of tooth or tooth pieces into adjacent potential

spaces, fracture of tooth, root –alveolar bone-maxillary tuberosity-mandible. Post-operative complications may include trismus, pain, rebound bleeding, pain, swelling, dry socket, infections, osteomyelitis sensory alterations of inferior alveolar nerve (IAN) or lingual nerve (LN). Sometimes the nerve damage may cause permanent alteration in the nerve function resulting into paresthesia. The prevalence of impacted third molars is quite different from county to country but mostly the prevalence ranges between 16.7–68.6% across various populations [7-14]. Studies from the Gulf region have reported an impacted third molars rate of 32–40.5% [13,14]. A recently published study from NEPAL found that 54.3% of young Nepali adults between 19–26 years old have at least one impacted third molar [15].

Methods

This retrospective analytical study was conducted at PAHS between January 2017 and December 2020 and included all consecutive patients who underwent removal of one or more impacted third molars under local anesthesia (LA). Patient's record was collected using log book mentioned at the dental department. All procedures were performed by consultant oral and maxillofacial surgeons with the helper who were trained to assist in oral and maxillofacial surgical procedures. All patients underwent standard surgical protocol. Patients with medical conditions like hypertensive, diabetic, kidney disease and other medical condition patients were consulted with their respective medical doctors, proper investigations were done. All needful precautions were taken and necessary local–haemostatic measures were used to control bleeding in needful conditions. In the majority of the cases Ward's incision were given, mucoperiosteal flap raised, bone guttering done and tooth resection were done in needed conditions using surgical drills. Elevators and forceps were used as per requirements. Once the surgical procedure is completed the socket is irrigate using beta dine and normal saline. The socket is packed using local haemostatic agent and sutured with black braided silk suture. In some cases bone graft was sued along with the PRF. Following the procedure, detailed postoperative instructions were given to the patients and suitable antibiotics and analgesics were prescribed. Routine follow-up was done after one weeks and suture is removed. If in case there is complication patient is kept under follow up.

Results

A total of 1920 patients had at least one third molar extracted under LA PAHS during the study period. From those patients, a total of 4220 third molars were extracted with the majority (54.68%) from male patients. The mean age of the subjects was 29 ± 5 years (range: 15–64 years) and most (58.07%) were 25–34 years old. The average number

of teeth extracted per patient was 2.19 ± 0.9 and 91.94% were mandibular third molars. The most common indication for molar extraction was pericoronitis (64.9%) and the least was 0.5% in pathology. Approximately two third of third molars (72.27%) were surgically extracted and involved buccal and distal bone removal with or without sectioning the tooth. Among non-surgically extracted teeth, most were maxillary third molars (Table 1).

Characteristic	n (%)
Gender	
Male	1050(54.68)
Female	870(45.31)
Age Range in Years	
15-24	758 (39.47)
25-34	1115(58.07)
35-44	25(1.30)
45-54	12(0.62)
55-64	510(0.52)
Indication for Extraction	
Pericoronitis	1245(64.9)
Adjacent tooth decay	250(13)
Cheek bite	170 (8.9)
Recurrent pain	90 (4.7)
Temporomandibular joint disorder	35(1.9)
Prophylactic	55(2.9)
Decay	50(0.9)
Prophylactic	8 (2.6)
Buccally erupting	15(0.7)
Pathology	10 (0.5)
Location of extracted third molars (N = 4,220)	
Mandible	3880 (92)
Maxilla	340(8)
Average per patient	2.19
Operative approach*	
Simple elevation without giving incision	310 (0.73)
Incision given, Bone Removal	3050 (72.27)
Incision given ,Tooth sectioning	860 (20.37)

Table 1: Preoperative and intraoperative characteristics of patients who underwent extraction of third molars PAHS dental department.

In this study, the rate of intraoperative and postoperative complications was 2.08% and 32.32%, respectively. Most

intraoperative complications were minor with tuberosity fractures (0.78%) being the most common, followed by fractures of the apical third of the root (0.41%) and

bleeding (0.26%). Postoperative complications were either inflammatory in nature (31.77%)—included swelling, pain, *trismus* and dry socket. (Table 2).

Complication	Frequency	Percentage by patient (n = 1920)	Percentage by tooth (n = 4,220)
Intraoperative complications			
Root fracture	8	0.41	0.18
Bleeding	5	0.26	0.11
Tuberosity fracture	15	0.78	0.35
Soft tissue injury	2	0.10	0.04
Damage adjacent tooth	3	0.15	0.071
Damage adjacent restoration/crown	2	0.10	0.04
Surgical bur fracture	5	0.26	0.11
Postoperative complications			
Swelling/pain/trismus	610	31.77	14.45
Dry socket	7	0.36	0.16
Secondary eeding	2	0.10	0.047

Table 2: Type and frequency of complications following extraction of third molars.

*n = 340 (number of maxillary third molars);

†n = 3880 (number of mandibular third molars)

Among intra-operative complications fracture of maxillary tuberosity were noted as 0.78% and soft tissue injury and damage to adjacent teeth were noted as 0.10% respectively. Among post-operative complications swelling/pain/trismus was the highest complication noted to be 31.77 % and dry socket to be the second highest complications noted as 0.36%. Luckily we never noted nerve injury to our patients that may be due to our gentle care during surgery.

Dry socket was observed in patients who have habits of smoking and not following the instructions given to them after surgical extractions. During our procedure we noted fracture of surgical burs in five cases which may be due to over use of same burs in many patients.

Discussion

Complications after third molar extractions are common. One or more may be associated with each other. Swelling, trismus, pain and infections are common complications after the procedure. Some may develop massive swelling and pain, fever, halitosis due to dry socket. Nerve damage and life threatening condition were quite rare in our study Brauer HU, et al. [16] in the current study, the overall intraoperative and postoperative complication rates were 3.7% and 8.3%, respectively. Most of the reported complications in our study were minor complications and transient in nature in terms of overall health of patients [3-6]. Azenha, et al. demonstrated

an overall complication rate of 10.4%, while Bui, et al. and Muhonen, et al. reported postoperative complication rates of 9.8% and 9.1%, respectively [16-18]. Complications following mandible third molar extractions were common than in comparison to extractions of maxillary third molars. Out of 659 complications documented, 633 (32.96%) were associated with mandible only. 26(1.35) were associated with maxilla. Most of the research shows the similar results as in our study [3-6]. In our study intra-operative complications were quite less encountered i.e. in 40 cases. Fracture of maxillary tuberosity were encountered to be maximum i.e. in 15 (0.78. %) cases and root fractures to be second most common complications encountered i.e. in 8 (0.41%) cases. All the fractured root apices were left intact due to close proximity to vital structures like inferior alveolar canal and maxillary sinus there were no any complications in follow up days. Clinically significant intraoperative bleeding was encountered in five cases (0.26%) in the current study, which is comparable to the reported range of 0.2–5.8% [2]. Bui, et al. determined that the frequency of unexpected hemorrhage was 0.6% and an American age-related third molar study reported a frequency of 0.7% [3-6]. The variability of reported rates could be due to the varying definitions and parameters of estimating bleeding.

During maxillary third molar extraction the common complication was fracture of maxillary tuberosity. During elevation using elevators causes fracture in different

level. Most of them were managed conservatively. In some cases where total fracture occurred were removed and local haemostatic placed and sutured. The current study found fifteen cases of tuberosity fracture, all of which were managed conservatively. Few cases of soft tissue injury were managed by primary closure using silk suture and removed after 5-7 days. Seven cases were restoration of adjacent teeth were fractured and managed by re-restoration at the same time after controlling. Most of the teeth with large restoration were at high risk of fracture during elevation [6] a very rare case in which the adjacent tooth got mobile while elevation of impacted tooth was managed by splinting for four weeks. After one month follow up tooth vitality was checked and found to be non-vital so root canal treatment was done and later on crown placement was secured free of cost to the patient. Furthermore, none of the intraoperative complications revealed any statistically significant association with postoperative complications.

Common complications we encounter and reported in the literature are pain, dry socket, infection, bleeding and sensory disturbances due to nerve injuries [2-6] in the present study; the overall postoperative complication rate was 32.23% [16-23]. Extraction of third molars is often associated with expected and typically transient postoperative pain, swelling and *trismus*; however, at times, this pain may present beyond the first postoperative week and may require additional treatment such as placement of a dressing or administration of antibiotics during a follow-up visit [2]. Five cases needed antibiotics and pain killer after post-operative complications. The literature reports a frequency of dry socket ranging from 0.3–26% for all extractions and is known to occur more frequently following third molar extraction [2-5] Some controlled studies have reported a rate of up to 25–30% after the extraction of mandibular third molars [19] Several studies have suggested that increased age, being female, the use of oral contraceptives, smoking, surgical trauma and pericoronitis are risk factors for dry socket [5,19-21]. The current study had a relatively low rate of dry socket (0.36%), with all cases occurring in relation to mandibular third molars and four occurred in patients aged 45–54 years old. However, contrary to published literature, dry socket occurred in two males who were non-smokers and one female who were not on oral contraceptives.

Injuries to the IAN and LN are well-known and are frequently occurring complications of third molar extraction. This type of injury is often troubling to both patients and surgeons and may result in considerable morbidity and litigation previous studies have shown widely ranging rates of LN and IAN injuries (0–23% and 0.4–8.1%, respectively) [3-6]. In our study this was we didn't encountered nerve injury even in single patient [16-23]. In cases of IAN injury, patients usually have a loss of sensation in the lower lip with or

without chin involvement on the affected side. In addition, patients may also present with tingling, tickling or burning sensations. Proximity of the third molars to the IAC is the most predictive factor for IAN injury [22]. In our study we did CBCT in all doubtful patients and surgeries were done very carefully to prevent nerve injury so luckily we didn't faced any problem. Patient's factors, tooth factors and operating surgeon determine the rate of complications after surgical extractions of third molars. Patient factors (e.g. age, sex, medical conditions, medication regimens and social habits), tooth factors (e.g. type of impaction, nature of bone, nature of roots, number of roots and tooth position), operative factors (e.g. duration, technique and surgeon experience) and an aesthetic factors (e.g. local and general anesthesia) have been reported as being associated with complications of third molar extraction [2-3] However, there was no statistical relationship in the current study between any of these factors and complications, except age and removal of bone.

Patients aged 30–39 years had higher rates of dry socket in this study, which is in agreement with published studies [21]. Rood suggested that permanent damage to the IAN and LN was significantly related to bone removal with a surgical drill [24-26]. This suggestion was consistent with the findings from the present study where there was a statistically significant relationship between bone removal and nerve injuries. Brann *et al.* and Costantinides *et al.* found that the rates of LN and IAN damage were more frequent when mandibular third molars were extracted under GA compared to local anaesthesia [27-28]. This finding could be due to surgical difficulty, preoperative pathology, age or anatomic position [27]. Postoperative infections after third molar extraction have been frequently reported in the literature, with rates ranging from 0.8–4.2% [2]. However, no cases of postoperative infection were encountered in the current study.

In this study we have included both the cases done in local and general anesthesia. The patients who were anxious were taken under general anesthesia. The cases were only 15 in number with total extraction of third molars existing in oral cavity the same patients. Complications were similar as that of patients operated in local anesthesia. Only the difference was the patients had to stay in Ward for three days to observe any general anesthesia complications. This study has some limitations-as this study was retrospective, cases with limited or missing data were encountered. A more complete data set could have helped analyze complications more precisely if information had been available detailing anatomic and radiographic positions of teeth, position of the IAN, indications for removal, social history including smoking and surgical difficulties. This shortcoming highlights the necessity for more comprehensive record maintenance and further studies that should include more parameters, such

as risk factors that can affect treatment outcome; this may help in minimizing complications in third molar extraction. The whole procedure and whole patients surgery was done by one surgeon, so there is no doubt in surgeons experience. The complications were quite less in comparisons to other studies.

Conclusion

This retrospective study is the first to analyze the various complications associated with third molar extraction in PAHS. The results suggest that most complications of third molar extraction are minor and within ranges reported in the literature. However, increased age and bone removal were found to increase the risk of postoperative complications. Smoking was found to be prime causative factor for dry socket in our study. Hence, a careful review of the indications and the necessity of an extraction should be considered preoperatively. These findings may help to improve treatment planning and patient education

References

- Miloro M, Ghali GE, Larsen PE, Waite PD (2004) Peterson's Principles of Oral and Maxillofacial Surgery. 2nd ed. London: BC Decker Inc pp: 139.
- Brown LH, Berkman S, Cohen D, Kaplan AL, Rosenberg M (1982) A radiological study of the frequency and distribution of impacted teeth. *J Dent Assoc S Afr* 37(9): 627-630.
- Fanning EA, Moorrees CF (1969) A comparison of permanent mandibular molar formation in Australian Aborigines and Caucasoids. *Arch Oral Biol* 14(9): 999-1006.
- Hugosan A, Kugelberg CF (1988) The prevalence of third molars in a Swedish population. An epidemiological study. *Community Dent Health* 5(2): 121-138.
- Hashemipour MA, Tahmasbi-Arashlow MT, Fahimi-Hanzaie FF (2013) Incidence of impacted mandibular and maxillary third molars: A radiographic study in Southeast Iran population. *Med Oral Patol Oral Cir Bucal* 18(1): e140-145.
- Kaya GS, Aslan M, Ömezil MM, Dayı E (2010) Some morphological features related to mandibular third molar impaction. *J Clin Exp Dent* 2(1): e12-17.
- Hattab FN, Rawashdeh MA, Fahmy MS (2010) Impaction status of third molars in Jordanian students. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 79(1): 24-29.
- Haidar Z, Shalhoub SY (1986) The incidence of impacted wisdom teeth in a Saudi community. *Int J Oral Maxillofac Surg* 15(5): 569-571.
- Hassan AH (2010) Pattern of third molar impaction in a Saudi population. *Clin Cosmet Investig Dent* 2: 109-113.
- Al-Anqudi SM, Al-Sudairy S, Al-Hosni A, Al-Maniri A (2014) Prevalence and pattern of third molar impaction: A retrospective study of radiographs in Oman. *Sultan Qaboos Univ Med J* 14(3): e388-392.
- Bouloux GF, Steed MB, Perciaccante VJ (2017) Complications of third molar surgery. *Oral Maxillofac Surg Clin North Am* 19(1): 117-128.
- Bui CH, Seldin EB, Dodson TB (2003) Types, frequencies, and risk factors for complications after third molar extraction. *J Oral Maxillofac Surg* 61(12): 1379-1389.
- Chiapasco M, De Cicco L, Marrone G (1993) Side effects and complications associated with third molar surgery. *Oral Surg Oral Med Oral Pathol* 76(4): 412-420.
- Haug RH, Perrott DH, Gonzalez ML, Talwar RM (2005) The American Association of Oral and Maxillofacial Surgeons age-related third molar study. *J Oral Maxillofac Surg* 63(8): 1106-1114.
- Sisk AL, Hammer WB, Shelton DW, Joy Jr ED (1986) Complications following removal of impacted third molars: The role of the experience of the surgeon. *J Oral Maxillofac Surg* 44(11): 855-859.
- Brauer HU (2009) Unusual complications associated with third molar surgery: A systematic review. *Quintessence Int* 40(7): 565-572.
- Azenha MR, Kato RB, Bueno RB, Neto PJ, Ribeiro MC (2014) Accidents and complications associated to third molar surgeries performed by dentistry students. *Oral Maxillofac Surg* 18(4): 459-464.
- Muhonen A, Ventä I, Ylipaavalniemi P (1997) Factors predisposing to postoperative complications related to wisdom tooth surgery among university students. *J Am Coll Health* 46(1): 39-42.
- Blum IR (2002) Contemporary views on dry socket (alveolar osteitis): A clinical appraisal of standardization, aetiopathogenesis and management: A critical review. *Int J Oral Maxillofac Surg* 31(3): 309-317.
- Garcia AG, Grana PM, Sampedro FG, Diago MP, Rey JM (2003) Does oral contraceptive use affect the incidence of complications after extraction of a mandibular third molar? *Br Dent J* 194(8): 453-455.

21. Alexander RE (2000) Dental extraction wound management: A case against medicating postextraction sockets. *J Oral Maxillofac Surg* 58(5): 538-551.
22. Jerjes W, Upile T, Shah P, Nhembe F, Gudka D, et al. (2010) Risk factors associated with injury to the inferior alveolar and lingual nerves following third molar surgery-revisited. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 109(3): 335-345.
23. Middlehurst RJ, Barker GR, Rood JP (1988) Postoperative morbidity with mandibular third molar surgery: A comparison of two techniques. *J Oral Maxillofac Surg* 46(6): 474-476.
24. Kiesselbach JE, Chamberlain JG (1984) Clinical and anatomic observations on the relationship of the lingual nerve to the mandibular third molar region. *J Oral Maxillofac Surg* 42(9): 565-567.
25. Carmichael FA, McGowan DA (1992) Incidence of nerve damage following third molar removal: A west of Scotland oral surgery research group study. *Br J Oral Maxillofac Surg* 30(2): 78-82.
26. Rood JP (1992) Permanent damage to inferior alveolar and lingual nerves during the removal of impacted mandibular third molars. Comparison of two methods of bone removal. *Br Dent J* 172(3): 108-110.
27. Brann CR, Brickley MR, Shepherd JP (1999) Factors influencing nerve damage during lower third molar surgery. *Br Dent J* 186(10): 514-516.
28. Costantinides F, Biasotto M, Maglione M, Di Lenarda R (2016) Local vs general anaesthesia in the development of neurosensory disturbances after mandibular third molars extraction: A retrospective study of 534 cases. *Med Oral Patol Oral Cir Bucal* 21(6): e724-730.