

Association between Risk Factors and Incidence of Complications Following Third Molar Surgery

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ABSTRACT

Background: The surgical removal of the impacted wisdom tooth is a frequently performed oral surgical treatment. Few commonly associated complications after wisdom tooth extraction are nerve damage, alveolar osteitis, pain, swelling, locked jaw, infection and bleeding. The present study was conducted with the aim to determine the association of risk factors with the postoperative complications after third molar removal.

Materials and Methods: The study was conducted in the private dental college and hospital. The hospital records of subjects from July 2014 to August 2015 were analyzed retrospectively. Presence of throbbing pain and exposure of the alveolar bone were regarded as signs of dry socket. After extraction, all subjects were prescribed similar antibiotic regimen and analgesic treatment. All the data was recorded in a tabulated form and analyzed statistically. Chi square test and student t test were used for statistical analysis. Probability value of less than 0.05 was considered as significant.

Results: The study analysed 200 subjects who underwent third molar surgery. The mean age of the subjects was 32.89+/-2.87 years. There were majority of males amongst them. There were 54% cases of mesioangular impaction, 22% cases of distoangular impaction and 13% cases of horizontal

impaction. Buccal guttering was performed in 95% of the subjects. There were only 5% cases that underwent lingual alveolotomy. The most commonly associated complication was delayed healing followed by alveolar osteitis. This was followed by injury to inferior alveolar nerve and lingual nerve. Delayed healing was significantly associated with number of sutures and the age group.

Conclusion: The gender and age of the subject also have an impact on the frequency of complications after extraction.

Keywords: Delayed, Extraction, Healing, Molar.

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INTRODUCTION

The surgical removal of the impacted wisdom tooth is a frequently performed oral surgical treatment.¹ Few commonly associated complications after wisdom tooth extraction are nerve damage, alveolar osteitis, pain, swelling, locked jaw, infection and bleeding.^{1,2} Other complications like fistula, herniation of buccal fat pad, and iatrogenic damage to the adjacent tooth and iatrogenic fracture of mandible. Pain, swelling and trismus are mostly observed amongst all subjects after this procedure, and the frequency of both mandibular nerve and lingual nerve injury is high and can be permanent.³

According to Jerjes et al.³, the incidence of 0.7% and 1.0% for mandibular nerve and lingual nerve damage was seen respectively after 2 years post-surgery. In another similar study, performed by Blondeau and Daniel, 3 (0.5%) cases of permanent nerve damage were detected amongst 6 cases of nerve injuries who had underwent surgical removal of their impacted molar

teeth.⁴ Most commonly, age has been found to be associated with the postoperative morbidity associated with the third molar surgery. As with advancing age, the bone tends to be more hard and brittle, therefore osteotomy is tedious leading to pain and swelling.^{3,5}

Other factors that affect the incidence of postoperative complications are gender, position of tooth, difficulty level, medical condition of the subject, use of oral contraceptive pills etc.⁶⁻⁸ The association between alveolar osteitis and the use of oral contraceptive pills is controversial amongst females. Some authors regard it as a risk factor for increased incidence of alveolar osteitis^{3,6,9} while others don't believe on this hypothesis.^{4,10}

The present study was conducted with the aim to determine the association of risk factors with the postoperative complications after third molar removal.

MATERIALS AND METHODS

The study was conducted in the private dental college and hospital. The records of subjects from July 2014 to August 2015 were analyzed retrospectively. All the subjects were informed about the follow ups and their enrollment in the study. The demographic details of the subjects like age, gender, socio economic data, all were collected from the medical records. The position of the tooth and operating factors like experience of surgeon, type of ostectomy, complications encountered during and after the procedure like nerve injury, delayed healing etc was recorded in a tabulated form. Abnormality in the labial or lingual sensation was considered as a sign of nerve damage. Presence of throbbing pain and exposure of the alveolar bone were regarded as signs of dry socket. After extraction, all subjects were prescribed similar antibiotic regimen and analgesic treatment. In case of delayed healing, the surgical site was reopened and followed by debridement and antibiotic prescription was given. All the data was recorded in a tabulated form and analyzed statistically. Chi square test and student t test were used for statistical analysis. Probability value of less than 0.05 was considered as significant.

RESULTS

The study analysed 200 subjects who underwent third molar surgery. The mean age of the subjects was 32.89+/-2.87 years. There were majority of males amongst them.

Table 1 demonstrates the type of impaction and the indication for surgery amongst the study subjects. There were 54% cases of mesioangular impaction, 22% cases of distoangular impaction and 13% cases of horizontal impaction. Least number of cases was that of vertical impaction. Majority of the cases reported due to recurrent pericoronitis (47%). There were 24% cases of apical pericoronitis reporting for surgery. Caries and irreversible pulpitis contributed to 13% and 10% cases respectively. Table 2 illustrates the operative variables involved in the study. Buccal guttering was performed in 95% of the subjects. There were only 5% cases that underwent lingual alveolotomy. Lingual flap was raised amongst only 7% of the subject's rest 93% didn't require one. There was also limited number (17%) that required root sectioning. Three sutures were placed amongst majority (43%) subjects. One suture was placed amongst only 20% subjects.

Table 1: Type of impaction and indication for surgery

| Variable | n | % |
|--------------------------------|-----|----|
| Type of impaction | | |
| Mesioangular | 108 | 54 |
| Distoangular | 44 | 22 |
| Horizontal | 26 | 13 |
| Vertical | 22 | 11 |
| Indications for surgery | | |
| Recurrent pericoronitis | 94 | 47 |
| Apical pericoronitis | 48 | 24 |
| Caries | 26 | 13 |
| Irreversible pulpitis | 20 | 10 |
| Prophylactic | 8 | 4 |
| Pain | 4 | 2 |

Table 2: Operative characteristics of the third molars

| Variable | n | % |
|----------------------------|-----|----|
| Surgical technique | | |
| Buccal guttering | 190 | 95 |
| Lingual alveolotomy | 10 | 5 |
| Lingual flap raised | | |
| Yes | 14 | 7 |
| No | 186 | 93 |
| Sectioning of root | | |
| Yes | 34 | 17 |
| No | 166 | 83 |
| Number of sutures | | |
| One | 40 | 20 |
| Two | 74 | 37 |
| Three | 86 | 43 |

Table 3: Factors affecting surgical complications

| Complication | Factor | Chi square | P value |
|-----------------------------|-------------------------------|------------|---------|
| Alveolar Osteitis | Cigarette smoking | 29.30 | <0.05 |
| | OCP | 12.89 | <0.05 |
| | Experience | 7.54 | <0.05 |
| | Number of sutures | 7.71 | >0.05 |
| | Age group | 11.98 | <0.05 |
| | Gender | 0.53 | >0.05 |
| Lingual Nerve Injury | Lingual flap | 11.85 | <0.05 |
| | Surgical technique experience | 10.44 | <0.05 |
| IAN Injury | Surgical technique | 2.10 | >0.05 |
| | Surgical technique | 4.36 | <0.05 |
| | Experience | 1.65 | >0.05 |
| | Sectioning of tooth | 1.77 | >0.05 |
| Delayed Healing | Position of tooth | 1.87 | >0.05 |
| | Cigarette smoking | 1.20 | >0.05 |
| | OCP | 1.33 | >0.05 |
| | Number of sutures | 23.87 | <0.05 |
| | Age group | 10.41 | <0.05 |
| | Gender | 1.70 | >0.05 |

The most commonly associated complication was delayed healing followed by alveolar osteitis. This was followed by injury to inferior alveolar nerve and lingual nerve. Delayed healing was significantly associated with number of sutures and the age group. The incidence of alveolar osteitis was significantly affected by cigarette smoking, use of oral contraceptive pills, age group and experience of the surgeon. Older subjects were more likely to develop alveolar osteitis than younger ones. (Table 3)

DISCUSSION

The complication frequency associated with third molar removal varies between 2.6 and 30.9 % and the results are influenced by a variety of factors like age and general health condition of the subject, gender, level of impaction, experience of surgeon, smoking status, use of contraceptive pills, oral hygiene status, and surgical technique.¹¹ The overall frequency and severity of complication are mostly associated with the level of impaction and

with the age group of the subject.¹² There may be a direct association between the level of impaction of the molar tooth and the frequency and incidence of postoperative complications. Majority of the complications are related to a greater level of impaction. Teeth classified as IC, IIC and IIIC impaction are associated with more complications than teeth classified as level B or A impaction.¹³ Mesioangular and distoangular impaction positions are related to approximately twice as many complications as other different tooth positions.¹³ Some other authors claim that horizontal and distoangular impactions are more prone to develop complications.¹⁴ Deeply impacted wisdom teeth require a bigger flap design and therefore the neighboring tissues and muscles are damaged more because of this wide and large access flap.¹⁵ There is a higher incidence of complications amongst females compared to males.¹¹ As per a study by Monaco et al, the incidence of postoperative edema amongst female patients was significantly higher compared to male patients.¹⁵ The surgeon's first hand experience is also detrimental towards the development of postoperative complications and can lead to social, financial difficulties resulting in a decrease inpatient's life quality.¹⁵ In the present study, there were 54% cases of mesioangular impaction, 22% cases of distoangular impaction and 13% cases of horizontal impaction. Least number of cases were that of vertical impaction. Majority of the cases reported due to recurrent pericoronitis (47%). There were 24% cases of apical pericoronitis reporting for surgery. Caries and irreversible pulpitis contributed to 13% and 10% cases respectively. The most commonly associated complication was delayed healing followed by alveolar osteitis. This was followed by injury to inferior alveolar nerve and lingual nerve. Delayed healing was significantly associated with number of sutures and the age group. The incidence of alveolar osteitis was significantly affected by cigarette smoking, use of oral contraceptive pills, age group and experience of the surgeon. Older subjects were more likely to develop alveolar osteitis than younger ones. Delayed healing is a commonly encountered problem after surgical extraction and in a study by Ruvo et al.¹⁶ delayed healing can be attributed to lifestyle changes, oral function, late appearance of symptoms and pain. The results of the present study were consistent with the studies on suture techniques and complications encountered by different authors after third molar surgery.^{17,18} With advancing age, bone tends to become more hard and brittle; osteotomy becomes more difficult leading to prolonged pain and increased incidence of alveolar osteitis⁶

CONCLUSION

The above study clearly establishes association of operative factors and the incidence of complications after third molar surgery. The gender and age of the subject also have an impact on the frequency of complications after extraction.

REFERENCES

1. Mercier P, Precious D. Risks and benefits of removal of impacted third molars. A critical review of the literature. *Int J Oral Maxillofac Surg.* 1992;21:17-27.
2. Ogini FO, Ugboko VI, Assam E, Ogunbodede EO. Postoperative complaints following impacted mandibular third molar surgery in Ile-Ife, Nigeria. *South Afr Dent J.* 2002;57:264-8.
3. Jerjes W, Swinson B, et al. Permanent sensory nerve impairment following third molar surgery: A prospective study. *Oral Surg Oral Med*

Oral Pathol Oral Radiol Endod. 2006;102:e1-7.

4. Blondeau F, Daniel NG. Extraction of impacted mandibular third molars: Postoperative complications and their risk factors. *J Can Dent Assoc.* 2007;73:325.
5. Shepherd JP, Brickley M. Surgical removal of third molars. Prophylactic surgery should be abandoned. *Br Med J.* 1994;309:620-1.
6. Benediktsdóttir IS, Wenzel A, Petersen JK, Hintze H. Mandibular third molar removal: Risk indicators for extended operation time, postoperative pain, and complications. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004;97:438-46.
7. Yuasa H, Sugiura M. Clinical postoperative findings after removal of impacted mandibular third molars: Prediction of postoperative facial swelling and pain based on preoperative variables. *Br J Oral Maxillofac Surg.* 2004;42:209-14.
8. Jerjes W, El-Maaytah M et al. Experience versus complication rate in third molar surgery. *Head Face Med.* 2006;2:14.
9. Garcia AG, Grana PM, Sampedro FG, Diago MP, Rey JM. Does oral contraceptive use affect the incidence of complications after extraction of a mandibular third molar? *Br Dent J.* 2003;194:453-5
10. Larsen PE. Alveolar osteitis after surgical removal of impacted mandibular third molars. Identification of the patient at risk. *Oral Surg Oral Med Oral Pathol.* 1992;73:393-7.
11. Azenha MR, Kato RB, Bueno RBL, Neto PJO, Ribeiro MC. Accidents and complications associated to third molar surgeries performed by dentistry students. *Oral Maxillofac Surg.* 2014 Dec;18(4):459-464.
12. Miloro M, Ghali GE, Larsen PE, Waite PD, Decker BC. Peterson's principles of oral and maxillofacial surgery. Inc Hamilton, Second Edition, 2004.
13. Blondeau F, Daniel NG. Extraction of impacted mandibular third molars: postoperative complications and their risk factors. *J Can Dent Assoc.* 2007 May;73(4):325. [PubMed]
14. Khan A, Khitab U, Khan MT. Mandibular third molars: pattern of presentation and postoperative complications. *Pakistan Oral & Dental Journal.* 2010 Dec;30(2):307-312
15. Atalay B, Guler N et al. Determination of incidence of complications and life quality after mandibular impacted third molar surgery. Belgrade, Serbia, 2008. XII. Congress of Serbian Association of Maxillofacial Surgeons with International Participation First Meeting of Maxillofacial Surgeons of Balkans. Oral Presentation
16. Ruvo AT, Shugars DA, White RP, Philips C. The impact of delay clinical healing after third molar surgery on health-related quality of life outcomes. *J Oral Maxillofac Surg.* 2005;63:929-35.
17. Waite PD, Cherala S. Surgical outcomes for suture-less surgery in 366 impacted third molar patients. *J Oral Maxillofac Surg.* 2006;64:669-73.
18. Osunde OD, Saheeb BD, Adebola RA. Comparative study of effect of single and multiple suture techniques on inflammatory complications after third molar surgery. *J Oral Maxillofac Surg.* 2011;69:971-6.

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