

An audit of impacted mandibular third molar surgery

Original Article

Obitade S OBIMAKINDE¹
Olanrewaju I OPEODU²
Akinkunmi M AKINPELU¹

¹Department of Dental and
 Maxillofacial Surgery
 Ekiti State University Teaching
 Hospital, Ado-Ekiti, Nigeria

²Department of Periodontology
 and Community Dentistry
 College of Medicine
 University College Hospital
 Ibadan, Nigeria

Author for Correspondence

Dr. Obitade S Obimakinde
 Department of Dental and
 Maxillofacial Surgery,
 Ekiti State University Teaching
 Hospital, Ado-Ekiti.

E-mail: tasky111@yahoo.com
 Telephone: +2348030759320

Received: March 26th, 2012;
 Accepted for Publication: April
 24th, 2012

ABSTRACT

Background: Mandibular third molar impaction is a major oral health burden globally. The associated morbidity and increasing public awareness necessitate the need for more researches into the subject of third molar impaction.

Objective: To audit cases of third molar impaction and its management in our institution.

Methodology: We carried out a descriptive clinical study involving patients who presented for management of impacted third molar between January 2010 and December 2011. Demography of the patients including third molar spatial relationship, indications for surgery and pre- and post-operative visual analogue score for pain, were analysed.

Result: Demography of the patients revealed a mean age of 27.67±7.19 (range 19-56 years) and male to female ratio of 1:1.15. The most common indication for surgery was peri-coronitis, and the mesio-angular variety was the most common form of impaction in our series (46.5%, N=40). Analysis of mean pre-operative and post-operative pain perception with paired t-test revealed statistically significant difference ($p=0.00$ & 0.01 , respectively). Only 14% of the patients developed post-operative infection.

Conclusion: Management of impacted mandibular third molar constitutes a sizeable workload of oral surgeons and dental practitioners globally. Early surgery for symptomatic impacted third molar tooth is hereby advocated.

Key words: Caries, dental, peri-coronitis, symptomatic, third decade

INTRODUCTION

Dental impaction is a common clinical problem that dates back to the ancient times.^{1,2,3} The mandibular third molar tooth (M3) also known as the wisdom tooth is the most commonly impacted tooth in the mouth and its removal is the most commonly performed dental operation.^{3,4} The impacted

M3 is often associated with severe jaw pain and discomfort which contribute to the deterioration in oral health quality of life of the affected patients.⁵ Prevalence of mandibular M3 impaction varies from one population to another and prevalence rates range from 9.5 to 35% has been reported by various authors.^{4,6,7,8,9} In a Nigerian study,

prevalence rates of 15.1% and 1.9% were reported in an urban and rural population, respectively, by Olosoji and Odusanya.¹⁰

General dental practitioners and oral surgeons are faced with the need to remove impacted M3 in the course of their daily practice.^{1,3,11} This calls for competence in pre-operative evaluation and extraction of such teeth.^{2,8} Some of the criteria that emerged for extraction of impacted M3 is the consensus recommended by National Institute of Health (NIH) which include: recurrent peri-coronitis, unrestorable dental caries, periodontal disease, internal or external root resorption and association of M3 with pathologic oral lesions.¹¹ In spite of the guidelines, a survey conducted amongst Nigerian Dentists by Owotade, *et al*, showed that only 28% of the respondents claimed to be aware of any protocol or guidelines in the management of impacted third molars which included indications for extractions.¹²

The increasing level of public awareness regarding morbidities associated with third molar removal have necessitated the need for dental professionals in Nigeria to develop a judgment policy on management of impacted mandibular third molar.^{12,13} There is no previous study on impacted M3 among Ekiti population and hence, it is difficult to draw comparisons.

The aim of the present study was to audit cases of M3 impaction and its management in our institution.

METHODOLOGY

It is a descriptive clinical study which was carried out at the Oral and Maxillo-facial Surgery Clinic of Ekiti State University Teaching Hospital, Ado-Ekiti. Patients that presented for wisdom tooth extraction between January 2010 and December 2011 were recruited for the study.

The demography of each patient was recorded on individual proforma and a standard peri-apical radiograph of the impacted wisdom tooth was taken to determine the angulation of the impacted M3 according to Winter's classification as modified by Quek, *et al*.⁷ The indication for surgical removal of the impacted M3 was documented in each case and a visual analogue scale of 1-10mm was used to measure pre-operative pain perception. All extractions were done under local anaesthesia using 2 cartridges of 1.8ml 2% lignocaine (adrenaline concentration of 1:80,000).

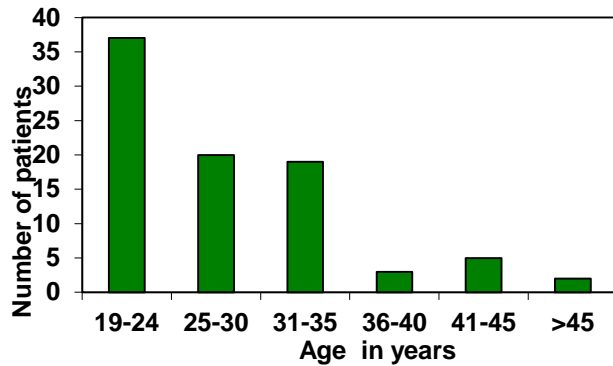
Post-operative review was done at the 7th day after surgery, and complications such as acute alveolar osteitis, nerve injury and wound infection were noted and recorded on the patient's proforma. Each patient was given a record sheet for post-operative pain which was marked at 24hours and 7th post-operative day, respectively. Pain measurement was done on a visual analogue scale of 1-10mm (10 being the extreme of pain while 1 corresponds to the lowest pain intensity).

Data analysis was done with Statistical Package for Social Science (SPSS version 17.0). Descriptive analysis of demography of the patients, pattern of M3 impaction and indication for surgery was carried out. Paired sample t-test analysis was used to determine whether there were significant differences between the pre-operative and post-operative visual analogue scores for pain. The level of significance was set at a *p-value* < 0.05.

RESULTS

A total of 86 patients successfully completed the study. Demography of the patients revealed a mean age of 27.67±7.19 (range 19-56) years and male to female ratio of 1:1.15. The age distribution showed that patients in the third decade of life constitute the majority of the study population (figure 1).

Figure 1. Age distribution of patients



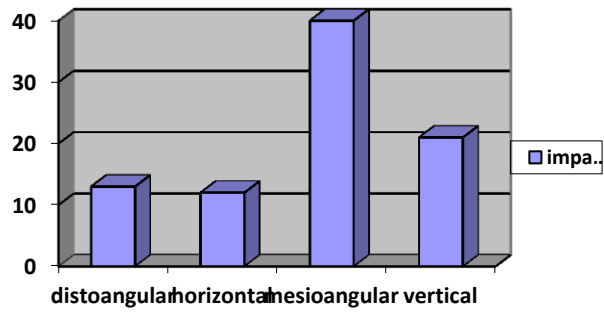
The majority of patients with impacted M3 usually present between the 3rd and 4th decade of life [$>20 \leq 40$ years of age]. It is a disease of the active phase of life.

The most common indication for wisdom tooth extraction is recurrent peri-coronitis followed by dental caries (table 1). Periodontitis was a more common indication in patients >35 years. It is interesting to note that 5 (5.8%) of our patients presented with obscured jaw pain which necessitated M3 surgery. Figure 2 showed the spatial relationship of impacted wisdom teeth in our series, the mesio-angular variety is the most common (46.5%, $n=40$) while the horizontal impactions constitute the least common (14.0%).

Table 1. Indications for extraction in relation to patients' ages

| Age Group | Peri-odontitis | Pain | Peri-coronitis | | Caries |
|------------|----------------|------|----------------|---------|--------|
| | | | Acute | Chronic | |
| 19-25years | 0 | 2 | 7 | 18 | 10 |
| 26-30years | 0 | 0 | 3 | 12 | 5 |
| 31-35years | 8 | 3 | 0 | 6 | 2 |
| 36-40years | 1 | 0 | 0 | 1 | 1 |
| 41-45years | 4 | 0 | 0 | 1 | 0 |
| 46years | 2 | 0 | 0 | 0 | 0 |
| TOTAL | 15 | 5 | 10 | 38 | 18 |

Figure 2. Pattern of impaction



The figure revealed that mesio-angular type of impaction is the most common in our series ($n=40$) followed by vertical impaction ($n=21$). The horizontal variety is the least encountered ($n=12$)

Comparison of mean visual analogue score with paired t-test showed a statistically significant difference between pain perception at 24hours and at the 7th post-operative day ($p=0.00$). Similarly, analysis of mean pre-operative and post-operative pain perception revealed statistically significant differences ($p=0.00$ and 0.01), respectively.

Complication rate following M3 surgery revealed that only 14% of cases in our series developed post-operative infection. Nerve injuries were observed in 3 cases, inferior alveolar nerve in 2 cases and lingual nerve injuries in 1. None of the patients in our series developed acute alveolar osteitis.

DISCUSSION

Impacted mandibular third molar surgery has continued to attract researches globally because of discomfort and deterioration of quality of life associated with impacted wisdom tooth. Furthermore, the increasing financial burden of impacted M3 related health issues and controversies on its management have made it an interesting area of inexhaustive research in dental practice.

The mean age (27.1years) in this study compared favourably with findings from previous studies where patients in the third

decade of life predominate.^{3,5,14,15} This, thus, substantiates the fact that the problems of M3 impaction present during the same period of life in different populations. In this study, most of the patients treated were in the third and fourth decades of life. This corroborates the assertion that the period between 20 and 40 years of age may be considered the most active years for third molar removal.⁵

There was a slightly higher female prevalence in this study with the male to female ratio at 1:1.15. Most authors also reported a higher female preponderance in the literature.^{1,3,5} However, Hattab and Von Women found no sex prevalence in their respective studies.^{4,16} The reason for higher female preponderance could be adduced to a lower tolerance to painful stimulus in females and their better health care seeking attitude.

The most common type of impaction in this study was the mesio-angular impaction which accounted for 46.5% of all the cases. Gbotolorun and Quek, *et al*, in separate studies reported 50 and 59.5% prevalence of mesio-angular impaction, respectively.^{5,7} Other Nigerian authors have also reported higher prevalence of mesio-angular impaction relative to other types of angulations.^{3,14,17} However, Ladeinde, *et al*, reported distoangular impaction as the most common in their study on the appropriateness of impacted M3 extraction.¹³ The primordial germ of M3 is said to develop high up in the mandibular ramus with its occlusal surface slanting mesially or sometimes, horizontally, and the developing crown then moves in response to postural change in the mandible induced by growth. Cessation of jaw growth before complete uprighting of the crown will most likely trap the developing tooth in a mesio-angular position.⁶

The most common indication for removal of impacted M3 in this study was peri-coronitis which made up 53.5% (n=46) of the cases. Of these, 8 cases were those with a first episode

of peri-coronitis while the remaining were cases of recurrent peri-coronitis. Many other studies reported peri-coronitis as the most common indication for removal of impacted mandibular third molar.^{3,5,8,12,16} In agreement with other studies, caries and its sequelae on the impacted and adjacent tooth constituted the two common reasons for excision of impacted M3.

All patients in our series experienced post-operative inflammatory discomfort in form of pain, trismus and swelling. The statistically significant difference in mean VAS scores at 24 hours and the 7th day post-operatively buttresses similar reports by other authors that M3 surgery is associated with transient inflammatory discomfort.^{1,3,14} The infection rate of 13.4% in this study is comparable to other studies although some authors have reported rates as low as 3% in studies comprising of large sample populations. Three cases of neurosensory deficits found in the present report are in agreement with similar studies, elsewhere. Neurosensory deficits in M3 surgery has been linked to increased age, deep bony impaction and intraoperative nerve exposure.^{16,18-19} However, we did not establish these findings in our series.

CONCLUSION

Impacted mandibular third molar removal constitutes a sizeable workload of oral surgeons and dental practitioners. Early surgery for symptomatic impacted wisdom tooth is advocated to avoid complications associated with late treatment.

REFERENCES

1. Ruta DA, Bissias E, Ogston S, Ogden GR. Assessing health outcomes after extraction of third molars: the post operative symptom severity (Posse) scale. *Br J Oral Maxillofac Surg* 2000; 38:480-487.
2. Liedholm R, Knutsson K, Iyell L, Rohlins M. Mandibular third molars: Oral Surgeons assessment of the indications for removal. *Br J Oral Maxillofac Surg* 1999; 37:440-443.

3. Obimakinde OS, Fasola AO, Arotiba JT, Okoje VN, Obiechina AE. Comparative effect of tube drain on post operative inflammatory complications of impacted mandibular third molar surgery. *Niger Postgrad Med J* 2010; 17:194-199.
4. Hattab FN, Rawashdeh MA, Fahmy MS. Impaction status of third molars in Jordanian students. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1995; 79:24-29.
5. Gbotolorun MO, Arotiba GT, Ladeinde AL. Assessment of factors associated with surgical difficulty in impacted mandibular third molar extraction. *J Oral Maxillofac Surg* 2007; 65:1977-1983.
6. Kruger E, Thompson WM, Konthasinghe P. Third molar outcomes from age 18 to 26; Findings from a population-based New Zealand longitudinal study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2001; 92:150-155.
7. Quek SL, Tay CK, Tay KH, Toh SL, Lim KC. Pattern of third molar impaction in a Singapore Chinese population: a retrospective radiographic survey. *Int J Oral Maxillofac Surg* 2003; 32:548-552.
8. AAOMS 1994. Report of a workshop on the management of patients with third molar teeth. *J Oral Maxillofac Surg* 1994; 52:1102-1112.
9. Wijk AV, Kieffer JM, Lindebom JH. Effect of third molar surgery on oral health-related quality of life in first postoperative week using Dutch version of oral health impact profile-14. *J Oral Maxillofac Surg* 2009; 67:1026-1031.
10. Olasoji HA, Odusanya SA. Comparative study of third molar impaction in rural and urban arrears of south - western Nigeria. *Odonto Stomatol Trop* 2000; 90:25-28.
11. National Institute of Health. Consensus development conference for removal of third molars. *J Oral Surg* 1980; 38:235-236.
12. Owotade FJ, Ugboko VI, Fatusi OA., Akinmoladun VI, Obuekwe ON, Olasoji HO. Management of impacted third molars among Nigerian dentists. *Odonto Stomatol Trop* 2002; 25:27-31.
13. Ladeinde AL, Ogunlewe MO, Adeyemo WL, Bamgbose BO. Appropriateness of Removal of Impacted Third Molars: a 2-year Audit at the Lagos University Teaching Hospital. *Niger J Hosp Med* 2003; 13:25-28.
14. Oginni FO, Ugboko VI, Assam E. Post operative complaints following impacted mandibular third molar surgery in Ile-Ife, Nigeria. *South Afr Dent J* 2002; 57:264-268.
15. Chang HH, Lee SH, Kole PJ: Periodontal healing after mandibular third molar surgery - A comparison of distolingualalveolectomy and tooth division techniques. *Int J Oral Maxillofac Surg* 2004; 33:32-37.
16. Von Women N, Nielen HO. The fate of impacted molars after the age of 20. *Int J Oral Maxillofac Surg* 1989; 18:277-280.
17. Olasoji HO, Odusanya SA, Ojo MA. Indications for extraction of impacted third molars in a semi urban Nigerian Teaching Hospital. *Niger Post grad Med J* 2001; 8:136-139.
18. Ingibjorg SB, Wenzel A, Peterson KJ, Hanne 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; 97:438-446.
19. Leung YY, Cheung LK. Risk factors of neurosensory deficits in lower third molar surgery: a literature review of prospective studies. *Int J Oral Maxillofac Surg* 2011; 40:1-10.