Indications for Extraction of Impacted Mandibular Third Molar in South Western Region of Nigeria

Emmanuel A Adelusi*, Victoria N Okoje, Tosin O Babarinde, Folaranmi O Olaniran and Olusegun J Adediran

Department of Oral and Maxillofacial Surgery, University of Ibadan and University College Hospital, Ibadan, Nigeria

*Corresponding Author: Emmanuel A Adelusi, Department of Oral and Maxillofacial Surgery, University of Medical Sciences, and University of medical Science teaching Hospital, Ondo City, Ondo State, Nigeria.

Abstract

Background: One or more tooth/teeth may fail to erupt fully or fail to erupt at all into the oral cavity due to one reason or the others, such a tooth is termed impacted tooth. Indication for extraction of impacted third molar teeth has generated some levels of controversy in the literature. While some reported Caries, some reported pericoronitis, and other pathologies as the main indication for extraction of impacted third molar teeth.

Objective: To determine the indications for the extraction of impacted mandibular third molars in the oral surgery clinic of oral and maxillofacial surgery department in University College Hospital (UCH) Ibadan, Nigeria.

Materials and Method: A retrospective study of all the patients who presented at the Oral Surgery clinic in UCH Ibadan between 1997 and 2018 was carried out. Necessary information was extracted from the Oral Surgery daily record book and the patient case file. Variable extracted include Age, Gender, Tribe, presenting complaint, Diagnosis, Angulation of impaction according to Winter's classifications, use of Antibiotics prior to presentation and Quadrant where the tooth was located. Data generated was analyzed using SPSS Version 23.0 and distributions of obtained values were compared using the Pearson $\chi2$ test and student t -test.

Results: A total of 1223 patients were included in the study between age group 18 - 70 years. Majority of the Patients presented with pain 1130 (92.3%) followed by food impaction 40 (3.3%). The most common indication was peritonitis 1097 (89.7%) especially recurrent type 1057(86.4%). Majority of the patients 1100 (90.0%) had used antibiotics before presentation which probably was not prescribed by a medical professional (Doctor).**Conclusion:** Several studies provided a potential approach to combine imaging and treatment for promoting effective dental pulp regeneration. Further prospective researches are required to improve the quality of evidence.

Conclusion: Conclusively, according to this study, pericoronitis is the main indication for extraction of mandibular third molar and self-medication is inevitable.

Keywords: Indication; Extraction; Mandibular Molar; Impaction; Pericoronitis

Introduction

An impacted tooth is one that fails to erupt into dental arch within the specific time [1,2]. The time of third molar eruption is variable among different individuals. While its eruption can start at early age of 16, it can also be delayed till age of 18 - 20 [3]. Mandibular third molars are the most frequently impacted teeth [4,5]. Different pathologies are responsible for patient presentation in the dental clinic for

extraction of the impacted third molars. Pericoronitis, Caries and other pathological factors are the reasons for patient seeking solution to the problems emanating from impacted third molars, many controversies arise as to which is the most frequent indication. Pericoronitis as a soft tissue infection around the crown of a partially erupted tooth, implies the accumulation of microorganisms and food particles [4] and it has been reported as the most common indication for removal of impacted mandibular third molars by some authors [6-9]. This they attributed to the possibility of pericoronitis being a common pathological condition of the mandibular impacted teeth. However, Prajapati., *et al.* [10] in their study in 2008, recorded caries (especially of the adjacent tooth) and its sequelae as the major reason (63.2%) for the mandibular third molar extraction, followed by recurrent pericoronitis (26.3%). Allen., *et al.* reported the incidence of 42% of the distal second molar caries associated with partially or completely impacted mandibular third molars.[11] and their finding is similar to other finding in the literature in which Caries of the impacted third molar was reported and this has been attributed to the tooth position and inclination which play a vital role in caries development process [8,12]. This is be observed in partially erupted teeth, they do not participate in mastication and thus provide a conditions more favorable for bacterial accumulation than fully erupted tooth [13].

This study was set to determine the indications for the extraction of impacted mandibular third molars in the oral surgery clinic of oral and maxillofacial surgery department in University College Hospital (UCH) Ibadan, Nigeria.

Materials and Methods

The study was conducted on patients who had extraction of impacted mandibular third molar done in the oral and maxillofacial surgery clinic UCH Ibadan between January 1997 and December 2018.

A retrospective review of 1271 patients who had mandibular third molar impacted teeth extracted were done but only 1223 who met the criteria for inclusion i.e. those who had complete information, were eventually included in the analysis, 48 patients were not included due to insufficient information. Variables related to Age, Gender, presenting complaint, Definitive Clinical Diagnosis, Type of impaction using winter's classification system and the quadrant where the impacted tooth was located, were extracted from case note and oral and maxillofacial daily record book.

Due to the nature of the study (retrospective study), informed consent could not be obtained from the patients.

Data was prepared and analyzed with SPSS version 23.0 software (SPSS Inc., Chicago, IL). $P \leq 0.05$ was considered statistically significant with 95% confidence interval. Chi-square and student's t-test were used where necessary.

All information gathered was carried out by two reviewers to avoid error of omission.

Results

A total number of 1223 patients who had impacted mandibular third molar extraction done between January 1997 and December 2018 were included and analyzed. The sample consisted of 490 (40.1%) male and 733 (59.9%) female (X^2 = 17.8 and P Value = 0.023) (Table 1) with age ranged from 18 to 71 and mean age of 27.8 (Table 1A and 1B).

The majority of patients' complaint was pain located around the last tooth 1130 (92.3%) followed by food lodgment in the hole on a tooth 40 (3.3%), Referral from orthodontics 23 (1.9%), jaw swelling 19 (1.6%) and accidental finding on radiographs 11 (0.9%) (Table 2).

Indications	Gender		Total	X²	P Value
	Male	Female			
Pericoronitis	427 (38.9)	670 (61.1)	1097 (100)		
Others	63 (50.0)	63 (50.0)	126 (100)		
Total	490 (40.1)	733 (59.9)	1223 (100)		
				5.8	0.02

Table 1A: Comparison of diagnosis (Indication for extraction) with gender.

Diagnosis (Indication for extraction)	Gender		Total	X²	P Value
	Male	Female			
Acute pericoronitis	18 (66.7)	9 (33.3)	27 (100.0)		
Chronic pericoronitis	5 (38.5)	8 (61.5)	13 (100.0)		
Recurrent pericoronitis	404 (38.2)	653 (61.8)	1057 (100.0)		
Other pathology (dentigerous cyst)	12 (54.5)	10 (45.5)	22 (100.0)		
Prophylactics	5 (45.5)	6 (54.5)	11 (100.0)		
Orthodontic reason	12 (52.2)	11 (47.8)	23 (100.0)		
Second molar pathology	12 (54.5)	10 (45.5)	22 (100.0)		
Caries	22 (45.8)	26 (54.2)	48 (100.0)		
Total	490 (40.1)	733 (59.9)	1223 (100.0)	15.5	0.03

Table 1B: Comparison of diagnosis (Indication for extraction) with gender.

Of 1223 reviewed cases, pericoronitis 1097 (89.7%) was the main definitive diagnosis and it was more in female than male (P = 0.02) (Table 1A); followed by dental caries 48 (3.9%) cases, other pathology like Dentigerous cyst and second molar pathology both have 22 (1.8%) cases each, orthodontic reason 2 (1.9%) cases and prophylactic reason 11(0.9%) cases (Table 2 and 3).

Diagnosis (Indication for extraction)	Presenting complaint					Total
	Pain	Jaw swelling	Food impaction within the tooth	Referral from orthodontics	Accidental finding on radiograph	
Acute pericoronitis	27 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	27 (100.0)
Chronic pericoronitis	13 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	13 (100.0)
Recurrent pericoronitis	1057 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1057 (100.0)
Other pathology (dentigerous cyst)	3 (13.6)	19 (86.4)	0 (0.0)	0 (0.0)	0 (0.0)	22 (100.0)
Prophylactics	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	11 (100.0)	11 (100.0)
Orthodontic reason	0 (0.0)	0 (0.0)	0 (0.0)	23 (100.0)	0 (0.0)	23 (100.0)
Second molar pathology	20 (90.9)	0 (0.0)	2 (9.1)	0 (0.0)	0 (0.0)	22 (100.0)
Caries	10 (20.8)	0 (0.0)	38 (79.2)	0 (0.0)	0 (0.0)	48 (100.0)
Total	1130 (92. 3)	19 (1.6)	40 (3.3)	23 (1.9)	11 (0.9)	1223 (100.0)

Table 2: Comparison of diagnosis (Indication for extraction) with angulation of tooth impaction.

Recurrent pericoronitis 1057 (86.4%) is the main presentation of all the periodontitis cases followed by acute pericoronitis 27(2.2%) and chronic pericoronitis 13 (2.2%) (Table 2-4). Indications for extraction were more in mesioangular than others forms of angulation (X^2= 27.5, P Value= 0.49), and Pericoronitis occur more in the mesioangular type of angulation than any other indications or all other indications put together, though not statistically significant P= 0.56 (Table 3).

Diagnosis (Indication for extraction)	Angulation of tooth impaction					Total
	Mesioangular	Distoangular	Horizontal	Vertical	Transverse	
Acute Pericoronitis	18 (66.7)	4 (14.8)	5 (18.5)	0 (0.0)	0 (0.0)	27 (100.0)
Chronic Pericoronitis	9 (69.2)	1 (7.7)	3 (23.1)	0 (0.0)	0 (0.0)	13 (100.0)
Recurrent Pericoronitis	585 (55.3)	177 (16.8)	195 (18.4)	94 (8.9)	6 (0.57)	1057 (100.0)
Other Pathology (Dentigerous Cyst)	12 (54.5)	1 (4.5)	4 (18.2)	5 (22.7)	0 (0.0)	22 (100.0)
Prophylactics	5 (41.6)	02 (16.7)	2 (16.7)	1 (8.3)	2 (16.7)	12 (100.0)
Orthodontic Reason	11 (50.0)	5 (22.7)	5 (22.7)	1 (4.6)	0 (0.0)	22 (100.0)
Second Molar Pathology (caries and its sequalae)	13 (59.1)	2 (9.1)	6 (27.3)	1 (4.5)	0 (0.0)	22 (100.0)
Caries	26 (54.2)	9 (18.8)	7 (14.6)	6 (12.5)	0 (0.0)	48 (100.0)
Total	679 (55.5)	201 (16.4)	227 (18.6)	108 (8.8)	8 (0.7)	1223 (100.0)

Table 3: Comparison of diagnosis (Indication for extraction) with angulation of tooth impaction.

Likelihood Ratio X^2 = 27.5 P Value = 0.49.

Left side of the mandible is more involved in all form of mandibular third molar impaction, though not statistically significant P = 0.6 (Table 4).

Diagnosis (Indication for extraction)	Quadrant		Total	X^2	P Value
	Right	Left			
Acute Pericoronitis	5 (18.5)	22 (81.5)	27 (100.0)		
Chronic Pericoronitis	2 (15.4)	11 (84.6)	13 (100.0)		
Recurrent Pericoronitis	425 (40.2)	632 (59.8)	1057 (100.0)		
Other Pathology (Dentigerous Cyst)	12 (54.5)	10 (45.5)	22 (100.0)		
Prophylactics	4 (33,3)	8 (66.7)	12 (100.0)		
Orthodontic Reason	11 (50.0)	11 (50.0)	22 (100.0)		
Second Molar Pathology	12 (54.5)	10 (45.5)	22 (100.0)		
Caries	22 (45.8)	26 (54.2)	48 (100.0)		
Total	493 (40.3)	730 (59.7)	1223 (100.0)	13.6	0.06

Table 4: Comparison of diagnosis (Indication for extraction) with affected quadrant.

Of 1223 reviewed patients, 1100 patients took antibiotics before presentation, almost exclusively in patients that presented with recurrent pericoronitis (1056), only 3 took antibiotics in acute periodontitis before presentation while all patients that presented with chronic pericoronitis took antibiotics before presentation, 8 cases in recurrent periodontitis have no record of pre- surgical antibiotics (X^2 = 1201.2, P Value = 0.000) (Table 5).

Diagnosis (Indication for extraction)	Antibiotics		Total	X^2	P Value
	Yes	**No**			
Acute pericoronitis	3 (11.1)	24 (88.9)	27 (100.0)		
Chronic pericoronitis	13 (100.0)	0 (0.0)0	13 (100.0)		
Recurrent pericoronitis	1053 (99.6)	4 (0.4)	1057 (100.0)		
Other pathology (dentigerous cyst)	1 (4.5)	21 (95.5)	22 (100.0)		
Prophylactics	0 (0.0)	11 (100.0)	11 (100.0)		
Orthodontic reason	0 (0.0)0	23 ()	23 (100.0)		
Second molar pathology	6 (27.3)	16 (72.7)	22 (100.0)		
Caries	14 (29.2)	34 (70.8)	48 (100.0)		
Total	10 (89.1)	131 (10.7)	1223 (100.0)	1201.2	0.000

Table 5: *Comparison of diagnosis (Indication for extraction) with the use of antibiotics prior to presentation.*

Discussion

Controversies in the literature about which pathology is the most frequent indication for extraction of third molar abounds, some authors reported pericoronitis as the main indication for extraction of third molar teeth, some mentioned caries of the impacted third molar while some even queried caries of the second molar.

Pericoronitis is a soft tissue infection located around the crown of a partially impacted tooth, whose appearance implies the accumulation of microorganisms and food remains [14] while Caries on the other hand is an infectious microbiologic disease of the teeth that results in sectorial dissolution and destruction of the calcified tissue [15]. It is one of the most common diseases in humans [15].

In this study, Pericoronitis is the most frequent indication for third molar extraction. This finding confirmed the findings of previous studies that reported pericoronitis as the most common indication for removal of impacted mandibular third molars [16,17]. This they attributed to pericoronitis being a probable common pathological condition associated with mandibular impacted teeth.

The impact of gender on the development and frequency of pericoronitis has been reported in the literature. In the present study, there is higher tendency in male patients for pericoronitis and this is in agreement with the study of Bataineh., *et al.* [8] and Yamalık and Bozkaya [9]. However, Yilmaz., *et al.* [18] reported male predominance while Almendros-Marqués., *et al.* [14] and Akarslan and Kocabay [19] found no gender predominance for all complaints and pathologies.

This present study, with the observation that angulation had a statistically significant impact on the development of pericoronitis and other clinical symptoms, confirmed that mesioangular angulation was an important factor for the development of clinical symptoms. This

finding is in agreement with those of Güngörmüs [20] and Kay [21] who observed in their studies that majority of pericoronitis were associated with mesioangular impactions. This is however different from the finding of Leone., *et al*. [22] who reported vertical and slightly distoangular third molars teeth as the most likely associated with pericoronitis. Polat., *et al*. [23] reported that most molars with pathoses were either in a vertical or in a mesioangular position, and these variations and differences have been attributed to geographical variation related to diet [24].

Caries is the second most common indication for third molar extraction in this study, this is however different from that of Prajapati., *et al*. [10] in their study in 2008, recorded caries (especially of the adjacent tooth) and its sequelae as the major reason (63.2%) for the mandibular third molar extraction, followed by recurrent pericoronitis [11]. Allen., *et al*. [12] reported the incidence of 42% of the distal second molar caries associated with partially or completely impacted mandibular third molars [12].

The left side of the jaw is more affected and pericoronitis is responsible for patients presentation for extraction of the mandibular third molar in this study, also it is deduced from the study that majority of the review cases patients cases especially those who presented with pericoronitis have taken one or two doses of antibiotics before presentation which they probably took without prescription by medical personnel, though this is not fully established as of the information related to this could not be extracted from many case notes but some were clearly documented.

Conclusion

Pain is the major cause of patient presentation to dental clinic and pericoronitis is the most frequent indication for mandibular third molar extraction in the southwestern region of Nigeria. Mesioangular impaction of mandibular third molar is the most frequently associated with pericoronitis and most of the patient had taken one or more a doses of antibiotics before presentation. We therefore suggest a prospective study to rule out or establish self-medication in this group of people, and full recording of patient drug history.

Bibliography

1. Hellman M. "Our third molar teeth: Their eruption, presence and absence". *Dental Cosmos* 7 (1936): 750-762.

2. Hup EE and Tucker MR. "Peterson: Contemporary Oral and Maxillofacial Surgery". 9th edition. St. Louis: Mosby (2002).

3. Abu Alhaija ES., *et al.* "Mandibular third molar space in different antero-posterior skeletal patterns". *European Journal of Orthodontics* 33 (2011): 570-576.

4. Breik O and Grubor D. "The incidence of mandibular third molar impactions in different skeletal face types". *The Australian Dental Journal* 53 (2008): 320-324.

5. Sadeta Sesis SP., *et al.* "Incidence of impacted mandibular third molars in population of Bosnia and Herzegovina: A retrospective radiographic study". *Journal of Health Sciences* 3 (2013): 151-158.

6. Ventä I., *et al.* "Radiographic follow-up of impacted third molars from age 20 to 30 years". *International Journal of Oral and Maxillofacial Surgery* 30 (2001): 54-57.

7. Yamaoka M., *et al.* "Root resorption of mandibular second molar teeth associated with the presence of the third molars". *The Australian Dental Journal* 44 (1999): 112-116.

8. Bataineh AB., *et al.* "The surgical removal of mandibular third molars: a study in decision making". *Quintessence International* 33 (2002): 613-617.

9. Yamalık K and Bozkaya S. "The predictivity of mandibular third molar position as a risk indicator for pericoronitis". *Clinical Oral Investigations* 12 (2008): 9-14.

10. Prajapati V K., *et al.* "Pattern of mandibular third molar impaction and its association to caries in mandibular second molar: A clinical variant". *Journal of Dental Research* 14.2 (2017): 137-142.

11. Allen RT., *et al.* "The mesioangular third molar--to extract or not to extract? Analysis of 776 consecutive third molars". *British Dental Journal* 206.11 (2009): 586-587.

12. Knutsson K., *et al.* "Pathoses associated with mandibular third molars subjected to removal". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 82 (1996): 10-17.

13. Fejerskov O and Kidd E. "Dental Caries: The Disease and Its Clinical Management". 2nd edition. Oxford: Blackwell Publishing Ltd (2008).

14. Almendros-Marqués N., *et al.* "Influence of lower third molar position on the incidence of preoperative complications". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 102 (2006): 725-732.

15. Babu N., *et al.* "Immunology of Dental Caries". *Biomedical and Pharmacology Journal* 9.2 (2016): 823-826.

16. Jamileh Y and Pedlar J. "Effect of clinical guidelines on practice for extraction of lower third molars: study of referrals in 1997 and 2000". *British Journal of Oral and Maxillofacial Surgery* 41 (2003): 371-375.

17. Khawaja AN. "Third molar impaction. A review". *Pakistan Oral and Dental Journal* 15 (2006): 97-101.

18. Yilmaz S., *et al.* "Assessment of Third Molar Impaction Pattern and Associated Clinical Symptoms in a Central Anatolian Turkish Population". *Medical Principles and Practice* 25.2 (2016): 169-175.

19. Akarslan ZZ and Kocabay C. "Assessment of the associated symptoms, pathologies, positions and angulations of bilateral occurring mandibular third molars: is there any similarity?" *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 108 (2009): e26-e32.

20. Güngörmüs M. "Pathologic status and changes in mandibular third molar position during orthodontic treatment". *The Journal of Contemporary Dental Practice* 15 (2002): 11-22.

21. Kay LW. "Investigations into the nature of pericoronitis". *British Journal of Oral Surgery* 3 (1966): 188-205.

22. Leone SA., *et al.* "Correlation of acute pericoronitis and the position of the mandibular third molar". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 62 (1986): 245-250.

23. Polat HB., *et al.* "Prevalence of commonly found pathoses associated with mandibular impacted third molars based on panoramic radiographs in a Turkish population". *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology* 105 (2008): e41-e47.

24. Murad N., *et al.* "Predisposing factors for the infection of mandibular third molar". *Pakistan Oral and Dental Journal* 33 (2013): 253-256.

Volume 19 Issue 11 November 2020