

DOI: 10.21767/2171-6625.100098

The Complications Associated with the Extraction of Asymptomatic Impacted Mandibular Third Molars: A Prospective Clinical Study of 63 Patients

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Abstract

Background: There are controversies and debates over the risks associated with the retention of asymptomatic impacted mandibular third molars when compared with the need for their extraction.

Objective: To determine the incidence and types of complications after the surgical extraction of asymptomatic impacted mandibular third molars.

Patients and methods: This was a four-year prospective, single blinded, clinical study, carried out at the Dental and Maxillofacial Surgery Clinic of our institution. The variables analyzed were patients' age, gender, types and site of impaction, and complaints during reviews.

Results: Overall, 115 patients with asymptomatic impacted mandibular third molars were seen, and 63/115 (54.8%) were treated. The age of the patients ranged from 26-65 years with a mean age of 42.3 ± 3.4 years. Majority (n=47, 74.6%) of the patients were in the age category of 31-50 years. The male: female ratio was 1: 1.3. Mesio-angular (n=33, 52.4%) impaction was the most common. Complication rate was 4.8%, comprising two (3.2%) females and one (1.6%) male who had numbness of the ipsilateral lower lip. The numbness resolved by the 4th post-operative week, and the extraction sockets clinically healed uneventfully.

Conclusion: This study shows that the complications associated with the surgical extractions of the asymptomatic impacted mandibular third molars were acute, neurological and without a permanent sequel.

Keywords: Mandible; Third molar; Impaction; Asymptomatic; Complication

66.0% [1-4]. The surgical extraction of these impacted mandibular third molars is a common procedure in dental practice, as well as in the oral and maxillofacial surgery clinic [1,2].

There are specific pathological indications for the extraction of these teeth. On the contrary, some researchers believed that these teeth have no definite role to play in the mouth except to be involved in pathoses, hence they are recommended for extraction even in the absence of any pathological condition [5,6]. Some other authors observed that the incidence of pathologies associated with an unerupted or impacted mandibular third molars are so low and insignificant that routine removal of asymptomatic impacted mandibular third molars should not be recommended [7,8]. The authors further noted that surgical morbidities such as pain, swelling and trismus are almost always universal in occurrence after the procedure, in addition to the surgical complications which may include bleeding, cellulitis, abscesses, septicemia, wound dehiscence, bone sequestra, paraesthesia, anaesthesia, hematoma, alveolar osteitis, temporo-mandibular joint dysfunction, and jaw fracture among others [1,2]. The existing literature suggests that there are controversies and vigorous debates pertaining to the risks of retention of asymptomatic impacted third molars, when compared to their being extracted because it is difficult to predict which asymptomatic impacted mandibular third molar will be pathologically involved or associated with diseases [3,5-7]. The disagreement regarding the fate of these asymptomatic teeth is also based on whether health necessity justifies the economic cost in terms of morbidities, complications and loss of income during the period of recovery and for the state or national healthcare systems, which may be partly billed for the surgical fees in some countries [9,10]. However, literature reviews showed that there is no consensus supporting or refuting the prophylactic extraction of asymptomatic impacted mandibular third molars in the general population [11,12]. Furthermore, a prospective study showed that general dentists recommend extraction of the impacted third molars in 59.0% of patients, mainly to prevent future problems or because a third molar had an unfavorable orientation or was unlikely to erupt [8]. The decision to extract these asymptomatic dentitions will most likely be acceptable when the decision is made on individual basis which is tailored to reflect their health status and access to adequate oral health care facility [13]. This prospective clinical study

Introduction

The impaction of mandibular third molars is common, and depending on how eruption and impaction are defined by different authors; estimates of the impaction frequency in the general population have been reported to range from 22.0% to

determines the incidence and types of complications after the surgical extraction of asymptomatic impacted mandibular third molars over a period of 4 years.

Patients and Methods

This prospective, single-blinded clinical study was done to determine the incidence and types of complications due to the surgical extractions of asymptomatic impacted mandibular third molars in patients that presented at our institution. The Health Research Ethics Committee of our establishment approved the study which was done in accordance with the Helsinki Declaration of 1975 on Medical Ethics and Protocol, as revised in year 2000. Sixty three (63) male and female adult patients between the ages of 26 and 65 years who gave informed consent for the extraction of their asymptomatic impacted mandibular third molars under local anesthesia after the maxillary antagonist third molars were earlier lost or extracted for pathological reasons were studied. The study was done at the Dental and Maxillofacial Surgery Clinic of our institution over a period of four years, from March 2010 to February 2014.

The inclusion criteria were subjects with mesioangular, distoangular, vertical, transverse and horizontal impactions with a difficulty index of 3-8 as specified in the Pederson's criteria for the assessment of the degree of impaction of impacted mandibular third molars [14]. Also included in the study were asymptomatic impacted mandibular third molars that were not in close proximity with the inferior dental canal, non-smokers of tobacco/narcotics drugs, and subjects that were not on steroid therapy or having any other systemic disease that would interfere with the healing process of surgical wound. The surgery of each impacted tooth lasted for 25 minutes. Impacted mandibular third molar teeth that were associated with oral lesions, patients that required more than one tooth extraction, pregnancy, lactating mothers and surgical procedures that lasted for more than 25 minutes were excluded from the study.

The surgical procedures were done by the same surgeon and dental surgery assistant in the same dental surgery setting. Local anesthesia was achieved using 2% xylocaine with 1:80,000 adrenaline. A full-thickness incision was made down to the bone to develop a 3-sided envelope mucoperiosteal flap with the surgical relieving incision extending as far forward as the distal one-third of the buccal surface of the second molar. The buccal flap was reflected using Howarth's periosteal elevator and Allis forceps, and bone was removed using the buccal guttering osteotomy technique. Using a round bur mounted on a slow-rotating straight hand piece, bone was removed under constant irrigation with 0.9% normal saline solution. The teeth were removed from their sockets with a coupland elevator and debridement of the sockets was done, hemostasis was achieved and the flaps were replaced without suturing after the extraction sockets were dressed with a piece of gauze impregnated with tincture of benzoin compound (TBC) solution which covered the entire circumference of the

sockets from the bottom to the surface. The duration of surgery commencing from the time the first incision was made to the placement of the TBC dressing was recorded in minutes. All the patients were given the same postoperative instructions, and prescription; oral non-steroidal anti-inflammatory analgesics (naproxen sodium 550mg 12 hourly for 5 days) and broad-spectrum antibiotics (clindamycin 150mg 12 hourly for 5 days).

The subjects were reviewed postoperatively in a blinded manner by the same surgeon on the third day (when the dressings were changed) and the seventh day (dressing removed and discontinued). Subsequently, the patients were reviewed after two, four, eight and 12 weeks. The clinical variables recorded were ages, gender, types and site of impaction, and complaints of the patients during the postoperative follow-up period. The data generated were analyzed using EPI INFO 7, 0.2.0, 2012 version software (CDC, Atlanta, GA, USA).

Results

Overall, 115 patients with asymptomatic impacted mandibular third molars were seen, and 63/115 (54.8%) were treated; 5/115 (4.3%) were not treated based on medical ground while 47/115 (40.9%) refused to give consent for treatment. The distribution of the age and gender of those that were treated are shown in **Table 1**. The age of the patients ranged from 26-65 years with a mean age of 42.3 ± 3.4 years. Majority ($n=47$, 74.6%) were in the age range of 31-50 years. There were more females than males, with male: female ratio of 1:1.3. The types of impaction are shown in **Table 2**. Mesio-angular ($n=33$, 52.4%) impaction was the most common. Twenty eight (44.4%) of the third molar impactions were located on the right half of the mandible while the rest ($n=35$, 55.6%) were on the left side.

Table 1 Distribution of age and gender of subjects.

Age	Gender				Total	
	Male		Female			
	n	%	n	%	n	%
21-30	4	6.35	4	6.35	8	12.7
31-40	12	19	17	27	29	46
41-50	6	9.5	12	19.1	18	28.6
51-60	4	6.35	3	4.8	7	11.1
61-70	1	1.6	0	0	1	1.6
Total	27	42.9	36	57.1	63	100

After surgery, all the patients treated had varying degrees of pain, swelling and trismus. These morbidities resolved as follows: pain 8-10 days, swelling 2-3 weeks, and trismus 2- 3.5 weeks. Two (3.2%) patients with vertical impaction and one (1.6%) that had disto-angular impaction complained of discomfort around the lower lips. These complications were 3

(4.8%) cases of numbness of the ipsilateral lower lip which were reported by the patients on the third post-operative day. This nerve morbidity affected two females and one male; their ages ranged from 33 to 42 years with a mean age of 37.7 years. The numbness resolved completely by the 4th post-operative week. All the extraction sockets healed uneventfully, and there was no record of side effect, allergy or inflammatory response to the medications used.

Table 2 Distribution of the types of impaction.

Type	Frequency	%
Mesioangular	33	52.1
Vertical	17	27
Distoangular	9	14.3
Horizontal	3	4.8
Transverse	1	1.6
Total	63	100.1

Discussion

Following the surgical extractions of the asymptomatic impacted mandibular third molars, this study recorded pain, swelling, trismus as surgical morbidities whereas numbness of the ipsilateral lower lip occurred as a complication; but all of these clinical entities resolved by the fourth post-operative week. Blondeau and Daniel [15] reported six neuro-sensory deficits in their series, 3 resolved and 3 were permanent. But unlike the present study, their study was not restricted to only those with asymptomatic impacted mandibular third molars. Pain, swelling and trismus are almost always commonly recorded after this surgical procedure [1,2]. Previous reports have attributed the numbness of the lower lip to the temporary paresis of the inferior alveolar nerve resulting from the post-operative inflammatory edema. The result obtained in this study may be attributed to the TBC dressing of the extraction sockets immediately post-operatively, and the sockets that were left open without suturing which encouraged wound drainage. The use of sutureless technique, and the role of TBC dressing after extraction of impacted mandibular third molars to protect the blood clot in the extraction sockets, has been found to reduce and prevent post-operative complications; and these was emphasized in an earlier study [16]. The surgical extraction of these teeth sometimes carries serious risks, such as permanent damage to nerves, osseous tissues and the temporo-mandibular joints which were not encountered in the present study [4,12]. However, based on the reports of earlier researchers, accurately weighing the risks of retention against removal of asymptomatic impacted mandibular third molar are the most important or difficult part of the decision to extract [7,11]. As it is difficult to predict which asymptomatic mandibular impacted third molar will be pathologically involved or associated with disease, the procedures that were carried out in these patients could be said to be beneficial to them as the complications were all acute and without a permanent sequel.

The finding in this study is contrary to that of Shepherd [17] who claimed that evidence suggests that patients generally consider the cost, morbidities and complications of surgical intervention as more serious and debilitating than those of non-intervention. Furthermore, is the observation by Hanson et al., [18] that patients with impacted lower third molars are more likely to have an angle fracture than those patients without impacted mandibular third molars and they therefore recommended the prophylactic extraction of such teeth in adolescents and young adults. In addition, Reitzik et al., [19] showed that mandibles containing unerupted or impacted mandibular third molars fractured at approximately 60.0% of the force required fracturing the mandibles containing fully erupted mandibular third molars. On the contrary, Zhu et al., [20] stated that partially erupted mandibular third molars contribute to the prevention of condylar fractures if left *in-situ* without extraction.

The ideal age to determine whether or not to remove third molars is still under debate, since impaction prediction has not been scientifically proven and it is a daunting task to predict this biological condition with any degree of reliability [21]. Osborn et al., [22] observed that alveolar osteitis, infection and paresthesia of the lower lip are less likely to occur in persons aged 35 to 83 years than in those aged 12 to 24 years, who are actually the ones to experience more third molar extractions. They further noted that the highest risk of complication is in persons aged 25 to 34 years. Also Gbotolorun et al., [1] stated that following impacted third molar extraction, morbidity and complications do not seem to increase with age. On the contrary, Blondeau and Daniel, [15] noted that these extractions should be done well before the age of 24 years, particularly in female patients, and that older patient are at greater risk of post-operative complications and permanent sequelae. In the present study, the mean age of the patients that had numbness of the lower lip was 37.7 years, and we recorded a lower complication rate without a permanent sequel. That more of the females were affected than the males could be attributed to genetic inheritance as was also observed by earlier researchers [5,6].

The risk of developing paresthesia after surgical extraction is not the same for all extractions. Friedman [10]. found that it is highest for the mesio-angular impaction in which the tooth is positioned at a 30-45° angle towards or against the distal or back surface of the second molar. The risks of temporary paresthesia range from 18.6% to 42.3%, while permanent paresthesia following extraction of a mesio-angular impaction is as high as 6.8%, much higher than for other types of impacted or unerupted teeth [7,8,12,23]. In the present study, those who had temporary paresthesia (4.8%) after the surgical procedure, were earlier diagnosed with vertical and disto-angular impactions, and the numbness resolved within four weeks post-operatively.

Adeyemo [24] reviewed the literature and found that some reports have estimated the proportion of asymptomatic impacted third molars extracted to be between 18.0% to 50.7%. The author further noted that the reasons for

prophylactic extraction include the need to maximize the risk of disease development, reduction of the probability of mandibular angle fracture, difficulty of surgery with increasing age, and that the third molars have no definitive function in the mouth. The present study shows that the prophylactic surgical extraction of asymptomatic mandibular impacted third molars is not a common practice in this environment particularly when the patients who received treatment are compared with those that were not treated. This observation was corroborated in an earlier report [25]. That more of these extracted asymptomatic impacted third molars occurred on the left side of the mandible than the right may have been due to genetic inheritance as reported by earlier researchers [5,6].

Conclusion

This study shows that the complications associated with the surgical extractions of the asymptomatic impacted mandibular third molars were acute, neurological and without a permanent sequel. As it is difficult to predict which asymptomatic mandibular impacted third molar will be pathologically involved or associated with disease, this treatment could be said to be beneficial to these patients.

Acknowledgement

We wish to express our sincere gratitude to Mrs. Ansa B. Ekpenyong of the Dental Therapy Unit, Department of Dental Surgery and Mrs. Ome Ogozi of the Department of Nursing Services, of this tertiary institution for their clinical assistance during the management of the subjects.

The authors have no conflict of interest to declare whether financial or personal relationships with other people or organizations. The authors viewed and agreed to the submission.

Conflicts of Interest

The authors declare no conflict of interest in the execution of this study

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