Impacted Mesioangular Mandibular Third Molars Extracted Without Raising of Mucoperiosteal Flap: Is It Possible?

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ABSTRACT

Objective: This study compared surgical outcome and quality of life of patients who had extraction of impacted mandibular third molars using standard technique and a less invasive approach.

Methods: All consecutive patients who had their symptomatic impacted mandibular third molar extracted via the transalveolar or a less invasive technique, at the Oral Surgery Clinic of our institution, were prospectively studied over a 3-year period. Oral quality of life score was assessed using the United Kingdom Oral Health Related Quality of Life (UK-OHQoL) questionnaire.

Results: The demographic data, indications for extractions, as well as preoperative QoL scores in both the experimental and study groups were comparable. All the teeth were of the mesioangular impaction type. The duration of extractions was significantly (P=0.001) longer in the transalveolar (29.2 ± 2.13) than the routine extraction group (16.6 ± 2.44). Of the three fractured teeth in the flapless technique, only one of them required raising of a mucoperiosteal flap and a transalveolar approach to extract the apical remnant, giving a success rate of 96.7% for the less invasive treatment approach for extraction of impacted mandibular third molar. The mean Oral health quality of life scores were significantly higher for patients in the routine extraction group compared to those in transalveolar group up to first 3days after surgery (P<0.001). At days 7 and 14 there no differences between the mean domain scores in both study populations.

Conclusion: Routine extraction of mesioangular impacted mandibular third molar is possible for selected cases. This will avoid the potential morbidities associated with surgical extractions of impacted third molars, and thus giving better QoL in patients undergoing third molar surgery.

Keywords: Impacted third molar, minimal invasive technique, quality of life

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INTRODUCTION

Complications arising from surgical extractions of impacted mandibular third molars have been reported to have adverse effects on the oral health-related quality of life (OHQoL) of patients undergoing the procedure.[1, 2] These complications range from inflammatory, infective to neurological damage. The latter has been a constant source of litigation.[3] The ensuing complications may result in physical, psychological and emotional morbidity on the part of the patient.[4]In the Western world large proportion of budgetary allocations is spent to settle health bills on third molar surgeries.[5]

Surgery for the impacted mandibular third molar involves making incision, elevation of a mucoperiosteal flap, ostectomy, tooth delivery, wound toileting and flap closure. The less invasive method involves use of elevators and extraction forceps only, similar to the approach for routine extractions and does not require the raising of a mucoperiosteal flap and ostectomy. The use of this approach, for selected cases, in the management of impacted lower third molars may avoid or minimize the incidence of some of the morbidities associated with surgical extractions, especially the inflammatory and neurological complications which could be quite distressing. This may result in better Oral health-related quality of life for patients undergoing this procedure.

While the literature is replete with different surgical and other non-surgical techniques aimed at alleviating the complications associated with surgical extraction of the wisdom tooth,[6-9] information on less invasive approach to the

extraction of impacted lower third molars is sparse.[9, 10] In the present, study we compared the outcome of impacted mandibular third molars extracted routinely using forceps and elevators only without raising a mucoperiosteal flap, with surgical extraction using standard techniques. In addition, the quality of life was compared in both treatment groups using the United Kingdom Oral Health related Quality of Life (UK-OHQoL) questionnaire in a Nigerian university teaching hospital.

MATERIALS AND METHODS

This prospective study investigated all consecutive patients who had their symptomatic impacted mandibular third molars extracted via the transalveolar or less invasive technique at the Dental and Maxillofacial Clinic of University of Calabar Teaching Hospital, Calabar, Nigeria from January 2012 to December 2014. The study was conducted in accordance with the Declaration of Helsinki 1975, as revised in 2000, and was approved by the Ethics Committee of our institution. A signed and dated informed consent was obtained from the selected participants after adequate explanation of the possible risks and benefit of the procedure.

The selection criteria were patients with partially impacted tooth of the mesioangular type, in Pell-Gregory class 1 and in positions A or B but with adequate space (≥3mm) between the amelocemental junction and the underlying alveolar bone as indicated on a plain radiographic view of the mandible (Figure 1). The exclusion criteria for the study were lower third molar impaction in Pell-Gregory classes 2 or 3, irrespective of the positions. Impacted teeth which may require sectioning or those with compromised crown or root structure due to dental caries or divergent root morphology were also excluded. In addition, the selected patients were non-smoking, and were not in any form of medications that may interfere with the healing process.

The patients were consecutively randomized into two groups as they present. Patients in group I had extraction of their partially impacted teeth removed without elevation of a mucoperisosteal flap and performing alveolectomy, while in the second group, the impacted tooth was removed via standard techniques. The patients in Group I were also consented to a completion of the procedure "surgically" in the event of a failure of the routine extraction technique.

Treatment Protocol

The quality of life (QoL) of the subjects was assessed preoperatively using the 16-item United Kingdom oral health related quality of life measure (UK-OHRQoL).[11] The selected teeth were extracted by an experienced single operator using forceps and elevators under local anesthesia for the participants in Group I and using a standard technique for surgical extraction for those in Group II. Haemostasis was achieved after completion of the procedures. Standard post extractions instructions were given to the participants. All patients also received the same medications. (Tab. Ibuprofen 400mg 8 hourly x 3 days, Metronidazole 400mg 8 hourly x 5 days and Cap. Amoxicillin 500mg 8 hourly x 5days), and they were instructed to return on days 1, 3, 7 and 14 postoperatively for evaluation. The patients were also asked to return to the clinic, outside the normal review days, in case of any unusual or prolonged discomfort.

Evaluation criteria

Patients were evaluated postoperatively on day 1, 3, 7, and 14 by a calibrated independent observer for the presence of alveolar osteitis. On each of these days, the subjects were also asked to complete the UK-OHRQoL (The United Kingdom Oral Health Related Quality of Life) questionnaire.[10] Each item was scored: Very bad effect- score 1, Bad effect- score 2, No effect- score 3, Good effect- score 4, Very good effect- score 5. Total scores range from 16 to 80. A lower score indicate poorer quality of life. Domain scores were presented in the result.

Data analysis

Information on the age, gender, impaction type, indication for extraction and the time taken to complete the extraction were obtained. The data were analyzed using SPSS version 13 and the results were presented as frequency and percentages, mean and standard deviation. Comparative statistics were done using Chi square and independent t-tests as appropriate. The psychometric properties of the United Kingdom Oral Health Related Quality of Life instrument were evaluated by means of internal reliability (Cronbachs' α). A p value of less than 0.05 was considered significant.

RESULTS

Cronbach's α were calculated for all the domains of the United Kingdom Oral Health Related Quality of Life instrument, and 0.79, 0.82, and 0.74 were obtained for the physical, psychological and social domain levels respectively. The demographic characteristics and indications for extractions in both the experimental and study groups were comparable (Table 1). All the teeth were of the mesioangular impaction type. The duration of extractions was significantly (P=0.001) longer in

Table 1: Demographic and clinical characteristics of participants in the routine and transalveolar extraction groups

Variables	Routine	Transalveolar	P value
Age (Mean ±SD)	26.6 ± 5.70	26.2 ± 4.62	0.785
Gender			
Male	16	15	0.796
Female	14	15	
Indications			
Recurrent Pericoronitis	21	22	
Apical Periodontitis	8	6	0.723
Unrestorable caries	1	2	
Time (Mean ±SD)	16.6 ± 2.44	29.2 ± 2.13	0.001**
Fracture tooth			
Yes	3	0	0.038*
No	27	30	

*Significant at P<0.05; **Significant at P<0.01

Table 2: United Kingdom oral health-related quality of life domain scores between patients in the routine and the transalveolar extraction groups

	Domain Scores (Mean ± SD)		
Evaluation Time	**Routine (n=30)**	**Transalveolar (n=30)**	**P -value**
Preoperative			
Physical	13.2 ± 0.50	13.1 ± 0.71	0.406
Psychological	12.3 ± 0.48	11.9 ± 2.19	0.334
Social	11.7 ± 0.48	11.6 ± 0.50	0.599
Day 1 Postoperative			
Physical	19.7 ± 1.27	10.2 ± 0.76	0.001*
Psychological	17.0 ± 0.83	10.0 ± 1.11	0.001*
Social	11.7 ± 1.73	9.2 ± 0.76	0.001*
Day 3 Postoperative			
Physical	24.3 ± 0.96	11.6 ± 1.38	0.001*
Psychological	19.7 ± 0.96	10.4 ± 0.49	0.001*
Social	19.7 ± 0.48	10.8 ± 0.76	0.001*
Day 7 Postoperative			
Physical	25.0 ± 1.44	24.0 ± 1.50	0.599
Psychological	24.3 ± 0.96	23.8 ± 1.19	0.061
Social	22.7 ± 0.48	22.6 ± 0.50	0.599
Day 14 Postoperative			
Physical	27.3 ± 0.96	27.6 ± 0.81	0.250
Psychological	24.7 ± 0.48	24.6 ± 0.49	0.598
Social	24.3 ± 0.96	24.2 ± 0.98	0.597

*Significant at P<0.01

Table 3: Mean quality of life scores in routine and transalveolar extraction treatment groups

Evaluation Period	Routine	Transalveolar	P -value
Preoperative	37.4 ± 0.49	37.2 ± 0.73	0.409
Postoperative Day 1	48.3 ± 0.96	32.9 ± 2.18	0.020*
Postoperative Day 3	63.7 ± 1.27	45.1 ± 7.24	0.001**
Postoperative Day 7	72.3 ± 3.14	71.2 ± 3.11	0.166
Postoperative Day 14	76.3 ± 1.27	76.4 ± 1.38	0.846

Significant at P<0.05; **Significant at P<0.01

the transalveolar (29.2 ± 2.13) than the routine extraction group (16.6 ± 2.44) (Table 1).

Three of the teeth in the Routine Extraction Group were fractured intraoperatively and this was the only complication recorded. Of the three fractured teeth, only one of them required raising of a mucoperiosteal flap and a transalveolar approach to extract the apical remnant, giving a success rate of 96.7% for the less invasive treatment approach for extraction of impacted mandibular third molar. The other 2 were extracted using combinations of Coupland and Cryer elevators without having to raise a mucoperiosteal flap. No similar complication was observed among the teeth extracted via the transalveolar approach. None of the patients in either of the group returned as a result of symptoms or signs suggestive of alveolar osteitis throughout the postoperative review periods. Preoperatively, the scores for all the three domains of physical, psychologic and social levels components of the UK-OHQoL instrument were comparable between both treatment groups (Table 2). However, in day 1 and day 3 postoperative evaluations, the mean values for all the three domains scores were significantly higher for patients in the routine extraction group compared to those in transalveolar group (P<0.001). In contrast, at days 7 and 14 there no differences between the mean domain scores in both study populations. The overall quality of life scores followed the same trend as the UK-OHQoL scores with the group 1 patients exhibiting better quality of life than the group II at days 1 and 3 postoperatively. At days 7 and 14, quality of life scores in both groups were comparable (Table 3).

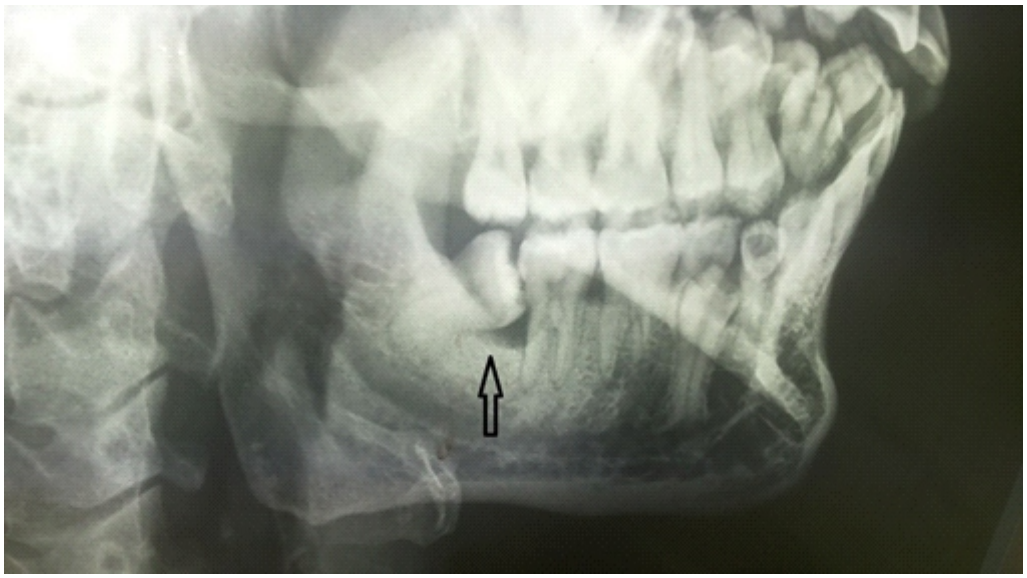

Figure 1: Partially mesioangular impaction. Note the triangular space below the amelocemental junction

DISCUSSION

The extraction of impacted third molars is a common oral surgical procedure.[12] It involves raising a mucoperiosteal flap and ostectomy, using either a mallet and a chisel or a motorized surgical drill, to uncover the buried tooth. These processes evoke inflammatory response which could present as pain, swelling and restriction in mouth opening.[1, 8, 9] Other complications include sensory nerve damage, dry socket and infection among others. Pain, trismus and swelling are almost universal after this procedure and the incidence of both inferior alveolar and lingual nerve damage is high and may be permanent.[3, 13, 14] In the present, study we compared the clinical outcome and oral health-related quality of life of patients who underwent impacted mesioangular mandibular third molars extraction using two treatment techniques.

Surgical extraction via the standard techniques took significantly longer time to complete than the less invasive approach. The results of the present study was in tandem with those of Kim et al.[10] who similarly observed a significant difference between the two treatment method. This is not surprising considering the number of stages involved in surgical extraction. It is generally believed that the longer the duration of surgery, the higher the potential postoperative morbidity such as pain and postoperative oedema. Although, these parameters were not evaluated in the present study, experience has shown that the inflammatory response associated with surgical extraction is usually more than that with routine extraction which is usually less invasive.[15]

Fractured tooth or incomplete extractions are common complications of extraction especially when the tooth has been root-filled previously. Compared to the standard technique that involved elevation of a mucoperiosteal flap and an ostectomy of the alveolar process, the less invasive method recorded significantly more tooth fractures. The reason for this may be due to application of less bucco-lingual or rotatory forces in the tooth extraction process in surgical extraction, since the overlying that may have contributed to the difficulty of extraction has been removed prior to application of forceps or elevator in the standard technique.

The overall rate of dry socket has been reported to vary from 0% to 35% for impacted third molar surgery and of much lesser values in routine extractions.[14, 16, 17] In the present study, not a single case of dry socket was observed in either of the study groups. The reasons for this observation may include the level of experience of the operator. Besides, the mean duration for the extractions were not unduly long (29.2±2.13 minutes) for the transalveolar group, which is comparable to the reported average time of 31.6 minutes for surgical extraction of the impacted mandibular third molar in a previous Nigerian study.[18] There is a higher risk of alveolar osteitis in procedures that lasts longer especially when the procedures are done by less experienced surgeons. The fact that the selected patients were non-smoking, and were not in any form of medications that may interfere with the healing process, prior to the extractions, may have accounted also for the zero occurrence of alveolar osteitis recorded in the present study.

The upsurge in different instruments for measuring oral health-related quality of life is sparked by the growing interest in quality of life studies in the dental community over the last 2 decades.[19] The reliability of the UK-OHQoL instrument previously ascertained by McGrath and Bedi[11] was further corroborated by the results of the present study which found 0.79, 0.82, and 0.74 for the physical, psychological and social domain levels respectively. The physical domain comprise eating, appearance, speech, general health, breath and comfort; the psychological domain comprise questions related to sleep, confidence, worry, mood and personality; while the social domain assesses social life, romantic relationship, work and finance.

Results from this study showed that patients who had undergone extraction of impacted teeth via the less invasive technique had better quality of life sores than the transalveolar group in the first 3 days after tooth removal as measured by the 16 items UK-OHQoL scores. This was seen across the physical, psychological and social domains. However at other evaluation periods, the UK-OHQoL scores were essentially the same between both the experimental and control groups. The result is similar to that of McGrath et al.[1] who reported reduced quality of life in the immediate postoperative period following third molar surgery as measured by OHIP-14 scores and OHQoLUK-16. In separate studies, Colorado et al.[20] and White et al.[21] have shown that the negative effect of lower third molar surgery only lasts for the first three postoperative days, with gradual improvement after that period. While there was a steady rise in the QoL scores from the preoperative value throughout the period of evaluation in the routine or less invasive group, the QoL scores was seen to drop below the basal value for the transalveolar group further supporting the often reported reduced quality of life in the early recovery phase of patients undergoing this procedure.

Flapless extraction of the impacted mandibular third molar was previously reported by Kim et al.[10] The authors found greater percentage of pain and swelling on the flap extraction side compared with that of the flapless extraction side in the same patient using a cross over study design. When a flapless procedure was used, the patients had a low incidence of postoperative complications and experienced minimal disruption in their quality of life after third molar surgery. In a similar study, Shevel et al.[7] found that when a small incision with minimal reflection of the mucoperiosteum was made, the postoperative pain and swelling were significantly less than when a larger incision with a standard flap was used. Although, these parameters were not evaluated in the present study, the transalveolar group has a higher propensity for development of these complications than the routine group, since these inflammatory sequalae are exacerbated by flap elevation and an alveolectomy which are essential sequence in conventional third molar surgery.[10]

CONCLUSION

Routine extraction of mesioangular impacted mandibular third molar is possible for selected cases. This technique is associated with better quality of life for patients as shown by the results of this study. However, adequate clinical and radiographic assessment is necessary prior to a decision to extract impacted third molar using the more conservative "non-surgical" approach. The factors to consider are age, type and depth of impaction, radiographic evidence of proximity to inferior alveolar nerve, availability of space between the amelocemental junction and the underlying alveolar bone, and the density of the alveolar bone in addition to favourable root curvature and absence of gross caries.

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