West African Journal of Radiology
Vol. 14 No. 1 April 2007

A Survey of Preoperative Radiological Investigation among Dental Professionals carrying out Impacted Lower third Molar Surgery in Eastern Nigeria.

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ABSTRACT
This survey was carried out to assess the attitude and the effect of utilization of preoperative radiological investigations in the management of impacted mandibular third molars among Dental professional in Eastern Nigeria. Questionnaires on preoperative radiological investigations were given to 56 Dental practitioners. Forty-eight were returned anonymously representing 85.7% response rate, which were used in our data analysis. Twenty-nine (60.4%) respondents do not bother about radiological investigation before surgical procedure while 19 (39.6%) insisted on preoperative radiological investigations before surgery. Out of these 19 respondents, all recommend periapical x-ray while 5 (26.3%) had a cause to recommend oblique lateral of the jaw at one time or the other. None of the respondents had used orthopanthomogram for preoperative radiological evaluation. Eight (42.1%) take and develop their periapical radiograph. Two respondents (10.5%) take their radiograph and send them out for development while 9 (48.3%) always send their patients outside for radiological investigation. Postoperative complication was low (15.7 %) among surgeons who utilize preoperative radiological investigations. Considering surgical difficulty, it was observed that difficult index scores were high among the 29 respondents that do not use preoperative radiological investigation. This study has identified preoperative radiological evaluation as a veritable instrument for effective and easy surgical management of impacted mandibular third molars.

Keywords: third molar surgery-radiological investigation-dental professionals.

INTRODUCTION
Impaction occurs where there is prevention of complete eruption into a normal functional position of one tooth or another, due to lack of space or obstruction by another tooth or development in an abnormal position.[1-3] Decision to extract impacted mandibular third molars is based on factors such as recurrent pericoronitis, caries either of the impacted tooth or adjacent second molar, presence of periodontal disease and some prosthetics and orthodontic reasons.[3] Recurrent pericoronal infection is considered the most common reason for the removal of lower impacted third molar.[4-7] As a general rule, the more difficult and time consuming the surgery of impacted lower third molar is, the more difficult and prolonged the postoperative recovery period.[8-10] The preoperative radiological evaluation is very important in determining the degree of surgical difficulty and the assessment of relationship between the roots of the tooth and inferior alveolar canal through which the neurovascular bundles pass. When these anatomical landmarks are not well demarcated before the surgical removal of impacted mandibular third molars, the overall result is high rate of complications.[4,5,8,11-14] There are different types of preoperative radiological investigation on lower third molar such as periapical radiographs, orthopantomogram or dental panoramic tomography (DPT), oblique radiographs of the jaws, and oculusal radiographs. Experiments using observers ranging in experience from undergraduates to consultants showed that the orthopantomogram can be used satisfactorily to assess the position, depth, type of angulations, the texture of the investing bone, as well as the relationship between the inferior alveolar nerve and the roots of the impacted lower third molars.[15] When used for this purpose this radiograph

compares well with the lateral oblique and intraoral views of the mandible. The value of the orthopantomogram in predicting impaired postoperative labial sensation was tested. It became apparent that there were cases in which the nerve was clearly at risk and others in which it was clearly not at risk.[16] Variations in the anatomy of the canal and the quality of its image could give rise to doubt, some of which could be resolved by taking intraoral views in combination with DPT. However, with the adoption of justification, optimization and limitation of dose in radiology, DPT is often the only view recommended [17,18] Incidentally in this environment, Nigeria we do not have the modern radiological apparatus such as the DPT for preoperative assessment, so periapical radiograph has become the most common preoperative radiological investigation before the lower third molar surgery. Notwithstanding the availability of periapical radiograph, most dental professionals carry out third molar surgery without any preoperative radiological investigations. This study therefore, was carried out to assess the attitude and the effect of utilization of preoperative radiological investigations in the management of impacted mandibular third molars by dental professionals in eastern, Nigeria.

PATIENTS AND METHODS

A survey on the attitude and utilization of preoperative radiological investigation by dental professionals was undertaking to determine its effectiveness in the management of impacted mandibular third molar. A total of 56 questionnaires were distributed among dental surgeons across the states (the Eastern region of the Federal Republic of Nigeria). Newly qualified dental surgeons and those undergoing their National Youth Service programme were excluded from the study. The eight-part questionnaires (Annex 1) distributed to dental surgeons were the same and were returned anonymously. Questions 1 and 3 were designed to find out the surgeons method of preoperative assessment in the surgical management of impacted mandibular third molar. Reasons for not utilizing preoperative radiological investigation were addressed in question 2. Complications of surgical removal of the impacted third molars were addressed in question 6. Five specific complications were included, these were lingual nerve damage, prolong paresthesia of the lip, inferior alveolar nerve damage, loss of taste sensation and purulent discharge. Surgeons were also asked to specify other complications they observed apart from the listed ones. Question 7 and 8 were specifically designed to find out the difficulty and the surgical outcome of using preoperative radiological investigation in the management of impacted mandibular third molar by using the difficulty index of 10 units. The degrees of difficulty were as follows: very difficult (7-10), moderately difficult (5-7), minimally difficult (3-4) and simple (0-2). Each surgeon therefore, marked the degree of difficulty with the corresponding index unit according to their personal experience during the lower third molar surgical extractions with and without preoperative radiological investigation.

RESULTS

Forty-eight out of the 56 questionnaires distributed among the dental professionals were returned anonymously, representing 85.7% response rate which were used in our data analysis. Twenty-nine (60.4%) respondents do not bother about radiological investigation before surgical procedure while 19 (39.6%) insist on preoperative radiological investigations before surgery. Twenty-one (72.4%) out of 29 respondents who do not make use of preoperative radiological investigation do so because of non-availability of radiological apparatus in their center. Out of the 19 respondents that utilize preoperative radiological investigation, all recommend periapical radiographs, 5 (26.3%) had a cause to recommend oblique lateral view of the jaw at one time or the other while 2 (10.5%) take posterior anterior (PA) view of the jaws (Table 2). None of the 19 respondents had used orthopanthomogram for preoperative radiological evaluation. Eight (42.1%) take and develop their periapical radiograph. Two respondents (10.5%) take their radiographs and send them out for development while 9 (48.3%) always send their patients outside for radiological investigation. Considering surgical difficulty, it was observed that difficulty index scores were high among the 29 respondents that do not use preoperative radiological investigation. Seven (24.1%) out of 29 find their surgical experience very difficult while none (0%) out of the 19 respondents were very difficult. Eleven (57.9%) of the 19 respondents had a simple surgical experience while on the other side, 4 (13.8%) experience simple surgical procedure (Table 3).

Postoperative complication was low (15.2%) among surgeons who utilize preoperative radiological investigations. However, it was observed that surgeons who do not make use of radiological investigation had postoperative complications as high as 72.1% (Table 4). Forty-five (89.2%) out the 48 respondents agreed that preoperative radiological investigation could help in proper identification of the type of impaction and therefore will give room for better planning before surgical procedure.

Table 1: Preoperative methods for the assessment of the positions of the impacted lower third molars.

Methods of assessment	Respondents'	Percentage
Radiology	19	39.6
Clinical observation	29	60.4
Total	48	100

Table 2: Types of x-ray commonly used for preoperative assessment by the respondents before third molar surgery

Radiographs	No.	Percentage (%)
Periapical	19	100
Oblique lateral	5	26.2
PA	2	10.5
Occlusal	0	0
Orthopantomogram	0	0

Table 3: Comparison of surgical difficulty between preoperative radiological investigation and clinical observation.

Difficulty	Index	Radiological (n = 19)	Clinical observation (n = 29)	Total
Very difficult	7-10	0 (0%)	7 (24.1%)	7 (14.6%)
Moderate	5-7	2 (10.5%)	11 (37.9%)	13 (27%)
Minimal	3-4	6 (31.5%)	7 (24.1%)	13 (27%)
Simple	0-2	11 (57.9%)	4 (13.8%)	15 (31.25)

Table 4: Comparison of postoperative complications between radiological assessment and clinical observation.

Complications	Radiological assessment (n = 19)	Clinical observation (n = 29)
Lingual nerve damage	0 (0%)	2 (6.8%)
Inferior alveolar nerve damage	0 (0%)	4 (13.6%)
Prolonged pareasthesia	2 (10.5%)	7 (24.1%)
Transient loss of taste sensation	1 (5.2%)	8 (27.6%)
Purulent discharge	0 (0%)	0 (0%)
Total	15.7%	72.1%

DISCUSSION

Preoperative evaluation of the third molar both clinically and radiologically, is a critical step in the surgical procedure. The surgeon pays particular attention to variety of factors known to make the surgical procedure more or less difficult. As a general rule, the more difficult and time consuming the surgery is the more difficult and prolonged the postoperative recovery period.[8,9,10] It is more difficult to perform third molar surgery when the position of the impacted third molar has not been ascertained and it is more difficult for these patients to recover from the surgical procedure without serious postoperative complications.[19] This is because the type of impaction is related to postoperative complications after lower third molar surgery and radiological investigation will give the anatomical details before the surgical procedures. It has been recommended that all patients having mandibular third molar tooth removed be warned of the possibility of both inferior alveolar and lingual nerve damage.[15] Considering alteration in labial sensation alone, only those patients in whom an intimate relation exists between tooth and nerve need be told prior to surgery. To do so surgeons must have a proper assessment of anatomical relationship of the neurovascular bundles to the root of the molar teeth. The dental panoramic tomography (DPT) has been recommended as the primary radiographic investigation of choice in the preoperative assessment of the mandibular third molar tooth.[20,21,22] Rood and Noraldeen[23] recommended a combination of periapical radiograph and DPT as method of quantifying the risk of neural involvement. Langland and Langlais [24] noted that the quality of an image is dependent on many factors but the ability of a radiographic image to show fine details is described as the resolution, which is recorded in line pairs per millimeter (1p/mm), and is a measure of ability of the radiographic image to discern the boundaries of two objects that are close together. The peri-apical radiograph has a resolution of 14-20 1p/mm, depending on film speed. The resolution across the focal trough or zone of sharpness of DPT is not uniform, being 2 1p/mm at the periphery of the focal trough and increasing to 3-5 1p/mm at the centre of the focal trough.[23,24] Therefore the peri-apical radiographs are more able to define small anatomical details including the outline of the inferior alveolar neurovascular bundle. Notwithstanding, the DPT is still the most acceptable means of preoperative imaging as many patients have difficulty tolerating the films used for peri-apical radiographs.[15] In Nigeria, periapical radiograph are common and are easily available. Despite its availability, we observed form this study that most dental surgeons do not utilize it for preoperative radiological investigation. Our study equally showed that non-utilization of the preoperative periapical radiograph among some dental surgeons was strongly associated with the non-availability of the radiological apparatus in their center. The overall result is an increase difficulty during surgery, which in turn leads to increase in the postoperative complications. This study therefore has identified the preoperative radiological investigation as a veritable instrument for effective and easy surgical management of impacted mandibular third molars. This calls for not only to emphasize on the importance of preoperative radiological investigation among dental surgeons carrying out lower third molar surgery but also provision of basic and essential radiological apparatus for effective management of impacted mandibular third molars.

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