



## Indications for surgical extraction of third molars: a hospital-base study in Accra, Ghana

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### ABSTRACT

**Background:** Third molar extraction is one of the most frequent procedures in oral surgery practice. **Aim:** To investigate the indications for this procedure in patients referred to a private and the oral surgery clinic of the Korle Bu Teaching Hospital, (KBTH), both in Accra, Ghana. **Methods:** This is a retrospective study of 402 patients treated between January 2007 and June 2009. Age and sex, indication for extraction; tooth extracted, type of impaction were analyzed. **Results:** 192 (47.8%) were male and 210 (52.2%) female; with male: female ratio of 1:1.1. Their age ranged between 15 and 70 years with a mean of 24.8 years. 243 (60.5%) were between 21-30 years, 87 (21.6%) between 31-40 years and 48 (11.9%) were over 40 years old. The commonest indication for surgery was pericoronitis (49.25%) followed by dental caries (26.1%). 94.8% involved the mandible and 5.2% the maxilla. 47.8% were in mesioangular, 26.1% in vertical, 22.4% horizontal and 3.7% in distoangular positions. Alveolitis sicca dolorosa and prolonged numbness of the lower lip were two main associated complications seen in six patients. **Conclusion:** The main reason for surgical extraction of impacted third molars was recurrent pericoronitis, occurring mostly in a relatively younger age group; followed by dental caries then prophylactic surgical extraction.

**Key words:** Third molar, indication, surgical extraction, pericoronitis, dental caries, Ghana

### INTRODUCTION

Third molar removal may be as old as removal of any permanent tooth. However in the first half of the 20th century and before, it was a formidable procedure.<sup>[1]</sup> Their special anatomical relations, the

pathologies including infections, cysts and tumours that may develop from them may have placed them in a special group. Due to the adverse side effects associated with their removal, surgery was delayed until patients had symptoms.<sup>[1]</sup> From the second half of the twentieth century technology



improved with the introduction of high speed rotary cutting instruments, improved surgical techniques, imaging, especially panoramic radiography and local/general anaesthesia, intravenous sedation all combined to significantly improve and simplify the removal of impacted third molars.<sup>[1]</sup> What was a dreaded surgical procedure requiring hospitalization became a routine safe office one with predictable outcome and relatively low cost.<sup>[1]</sup>

Controversy still rages as to what the real indications for removal of third molars are; and removal of symptomless third molars seems to provoke the most controversy. Some have been listed clearly and include the enlargement of a follicle, pericoronitis, caries, pressure and resorption of adjacent teeth.<sup>[1,2,3]</sup> These may have pathologies potentially associated with them and may merit removal. Possible serious complications such as fractures of the jaw, permanent paraesthesia and those due to anaesthesia are some of the reasons why some surgeons are extremely cautious in deciding which option is best for their patients.<sup>[4]</sup>

In some countries protocols have been developed to guide surgeons in their management of third molars;<sup>[1,5]</sup> whilst in others controversy, still remains as to why and when to remove third molars; preferring to leave the decision to the clinician.<sup>[2,3]</sup> The aim of this study was to find out the reasons why the third molars were surgically removed in referred patients in an urban Ghanaian population.

## METHODOLOGY

A retrospective study of the clinical charts and radiographs of referred patients who had their third molars surgically removed at two geographic locations in Ghana, namely Korle Bu Teaching Hospital and a private dental clinic in Accra- between January 2007 and June 2009. All Surgical procedures were carried out under local anaesthesia using rotary burs and water coolants. The study was approved by Ethical Committee of the institutions. Excluded from the study were patients who were younger than 15years old, those with complicated medical history like haemophilia (American Society of Anaesthesiology ASA III or more) and sickle cell disease, and those with incomplete records. The parameters

recorded included the age, gender, medical history, the reason for referral, the angular impaction using Winter's classification, the site of the impacted tooth, tooth extracted, reason for the extraction and complication, if any, associated with treatment.

## Statistical analysis

The data obtained were analyzed using Microsoft Excel software.

## RESULTS

The study sample consisted of charts of 402 patients. 192 were male (47.8%) and 210 female (52.2%), giving a male to female ratio of 1:1.1. The youngest patient was 15 years and the oldest 70 years. The mean age for males was 26.9 years, for female 22.9 years and for the entire patient population 24.8 years, (table 1).

Table1: Mean age of patients in the study sample

Sex	Mean Age	Number	Standard Deviation
Male	26.9	192	0.99
Female	22.9	210	0.97
Total	24.8	402	0.99

The peak age range was 21-30 years, (N=243), representing 60.5% of study sample, followed by the age range of 31-40 years (N=87), constituting 21.6% of study sample and only 48(11.9%) were over 40 years. Before the age of 30 years most cases (60.67%) were seen in females, while after 30 years most cases, 64.44% were seen in males (table 2).

Table 2: Sex and age distribution of the study sample

Age	Male (%)	Female (%)	Total (%)
10 - 20	3 (1.6)	21(10%)	24(6.0)
21- 30	102(53.1)	141(67.1)	243(60.4)
31 -40	57(29.7)	30(14.3)	87(21.6)
41- 50	15(7.8)	9(4.3)	24(6.0)
51- 60	12(6.3)	3(1.4)	15(3.7)
61- 70	3(1.6)	6(2.9)	9 (2.2)
Total	192(100)	210(100)	402(100)

Table 3: Diagnoses leading to surgical extraction of third molar

Diagnosis	Male	Female	Total (%)
Pericoronitis	78	120	198 (49.25)
Caries in 3rd molar	60	45	105 (26.12)
Prophylaxis	12	15	27 (6.72)
Caries in adjacent tooth	18	9	27 (6.72)
Retained cyst or tumour	6	9	15 (3.72)
Periapical pathology	9	3	12 (2.99)
Periodontal disease	3	6	9 (2.24)
Undiagnosed pain	6	3	9 (2.24)
Total	192	210	402 (100)

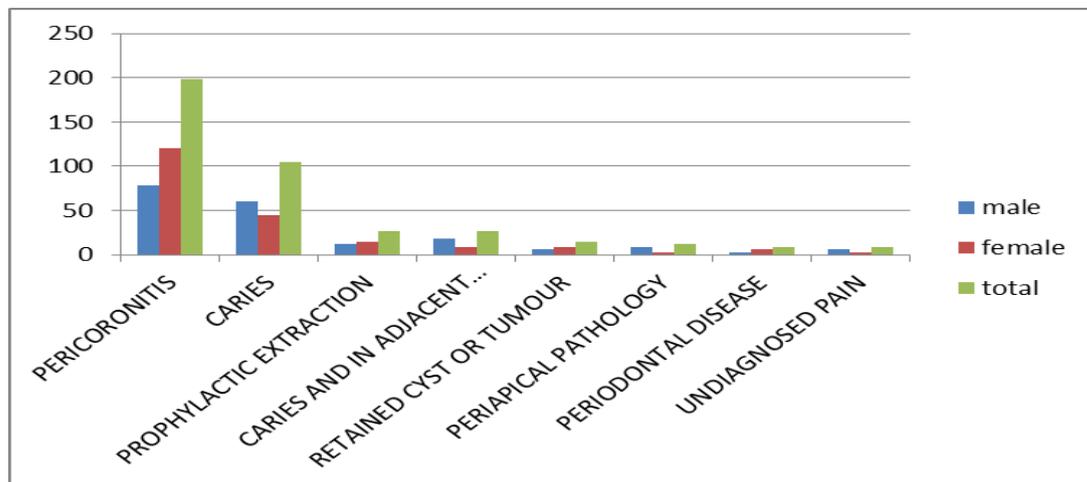


Figure 1: Diagnosis leading to surgical removal of third molar. Yates chi-square: 15.339; *P*-value: 0.03189)

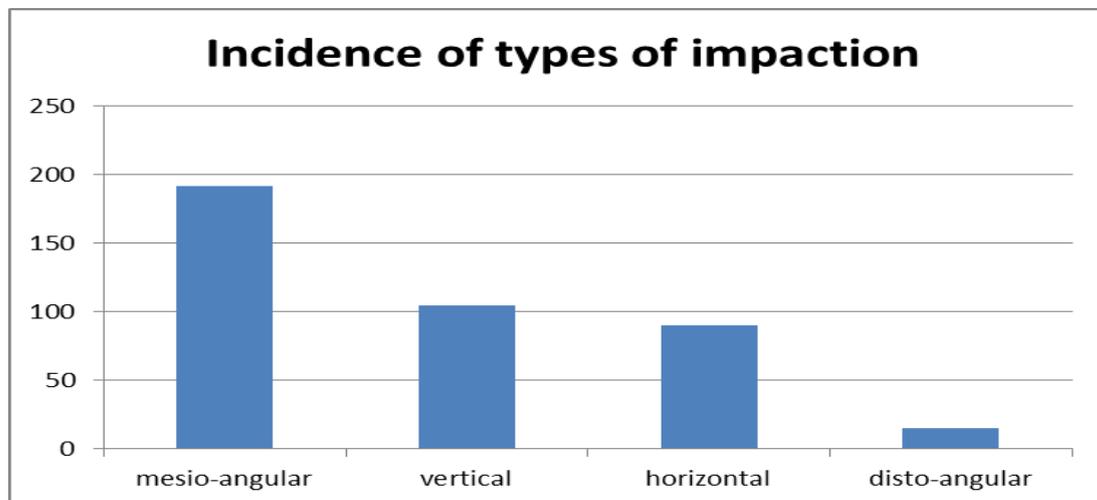


Figure 2: Type of third molar impaction encountered (Winter's Classification)

The commonest reason for extraction of third molars was recurrent pericoronitis, 49.25%, and then caries, 26.1% (Figure 1 and Table 3). The third molar of the first quadrant accounted for only 0.7% (N=1), that of the second quadrant, 4.5% (N=6), while those of the third and fourth quadrants accounted for 53.7% (N=72) and 41.0% (N=55) respectively, of all third molars extracted. 47.8% (N=192) were in mesioangular, 105 (26.1%) in vertical, 90 (22.4%) in horizontal and 15 (3.7%) in distoangular impaction, (Figure 2). Apart from mild pains and trismus over a few days, prolonged numbness of the lower lip, beyond six weeks, on the treated side was seen in 3 cases, all female and in the 21-30 years age group; and excessive pain and delayed healing from alveolitis sicca dolorosa in 3 patients, 2 male and 1 female, all in the 61-70 years age bracket.

## DISCUSSION

The third molar tooth removal can be beneficial to patients but like most surgical procedures there may be associated morbidities some of which are long term and are best avoided. Modern technology and technique have drastically reduced the extremes of these morbidities.<sup>[1]</sup> In deciding whether to remove a third molar or not the benefits need to be weighed against the adverse side effects of the procedure.<sup>[3]</sup> The American Association of Oral and Maxillofacial Surgeons, (AAOMS) gives risk factors that should be employed to help decide which way to go.<sup>[3]</sup> It suggests pathology, infection and damage to other structures as the indications.<sup>[3]</sup> In some health systems clear guidelines or protocols have been developed to assist surgeons who carry out removal of third molars.<sup>[1]</sup> We aimed in this study to identify the demographic characteristics and the reasons for removal of third molars of referred patients in Accra, Ghana.

The ages of patients ranged between 15 and 70 years, which is the mean age for males was 22.9 years, females 26.9 years and for both sexes, 24.8 years. 243(60.5%) patients were between 21-30 years, 87(21.6%) between 31-40 years and only 48(11.9%) were over 40 years.

The male to female ratio was 1:1.1(47.8%:52.2%); giving no significant

gender difference. Chi-square test calculation<sup>[6]</sup> also suggests that there is no significant gender variation as far as the indications for surgical extraction of third molars are concerned. In a study among Singaporean Chinese, Quek *et al.*<sup>[7]</sup> reported a ratio of 44% male and 56% female, (ratio of 1:1.3).

Before 30 years, there were more females than males, and the reverse was true after 30. The gender variation is difficult to explain and could be due to the general tendency for men to present late in most acute conditions compared to women.<sup>[8]</sup> The incidence was 84.5% in the age group 10-30 which is relatively young. Similar findings were reported in studies from Nigeria where 88.8% of patients were in the age group of 16-30.<sup>[9]</sup>

The main indication of third molar extraction in this study was for the treatment rather than the prevention of pathology. Pericoronitis (49.25%) was the leading cause of extraction of the third molar; it was followed by caries (26.12%), prophylactic reason and caries of the adjacent teeth, (both 6.72% each), and others respectively. These figures are closely similar to results obtained in studies by Bataineh *et al.*, 2002, who in their initial study of Jordanian patients referred to a University Service of Oral and Maxillofacial, attributed 47% of third molar extractions to the presence of pericoronitis, and 7.7% to caries.<sup>[10]</sup> Also, Bruce *et al.* in a prospective study reported pericoronitis to be the most frequent reason in 40% of patients for third molar removal in different age groups.<sup>[11]</sup> According to them, in patients up to 30 years old, pericoronitis increased to 56.12% and was followed by caries which accounted for 20.22%.<sup>[11]</sup> However, in patients over 30 years, caries was the main reason, accounting for 37.8% and pericoronitis 33.33% of all third molar surgically extracted.<sup>[11]</sup> Recurrent pericoronitis occurring in relatively younger age was also the major reason for surgical extraction of impacted third molars in a study from Nigeria.<sup>[12]</sup> In a similar study done in Spain however, Fuster-Torres *et al.*<sup>[13]</sup> reported that in patients between the age 14-30, prophylactic removal was the most frequent reason while in patients above 30 years the most frequent reason was the presence of pathology.

Most (94.78%) of all the surgically extracted third molars were located in the mandible and most of them were in mesioangular position. Overall, 47.8% of impacted third molars occurred in mesioangular, 26.1% in vertical, 22.4% in horizontal and 3.7% in distoangular position. Studies in Nigeria showed that mesioangular type of impaction was the most frequently seen as well.<sup>[9,14]</sup> Obeichina *et al.* reported 48.2% for mesioangular impaction and 30.23% for vertical impaction of third molar teeth presenting with symptoms.<sup>[9]</sup> Mesioangular impaction was also reported as the most common finding in Singapore Chinese population, (80%) and Korean populations (46.5%) studied.<sup>[7]</sup> One Spanish study by Chaparro-Avendaño *et al.*,<sup>[15]</sup> reported similar result of predominant mesioangular impaction (71.5%). Another study in Barcelona however reported vertical angulation type of impaction as predominant (47.9%) and mesioangular 20.5%.<sup>[16]</sup>

Radiolucency in excess of 4mm was regarded as cystic lesions while smaller ones were considered as dilated follicles. They constituted about 3% of all associated pathological conditions, and were all located in the mandible. Bataineh *et al.*<sup>[10]</sup> found it as the third commonest cause for third molar surgery in their study, accounting for 1.8% of third molar surgeries done.

## CONCLUSION

The main reason for surgical extraction of impacted third molars was pericoronitis, occurring mostly in a relatively younger age group and affecting more females than males. This was followed respectively by dental caries and prophylactic surgical extraction. Mesioangular impactions occurring mainly in the mandible had the highest incidence.

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**Conflict of Interest:** None declared

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