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Study of prevalence and pattern of impacted mandibular third molar in a tertiary care centre: A retrospective study

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Abstract---Aim: To study the prevalence, pattern and postoperative complications of impacted third molars based on Pell and Gregory and Winter's classification. Methods: This retrospective study was undertaken on 300 patients in the Thoothukudi Government medical college hospital in the department of dental surgery. Patients diagnosed with impacted mandibular third molars and treated

surgically under local anesthesia were included in the study. Patients with incompletely formed roots, absence of adjacent second molar were excluded. The data collected were analyzed by applying descriptive statistics. Results: The most common type of impaction was mesioangular (n=135, 45%) followed by vertical (n=100, 33.3%) and horizontal impaction (n=34, 11.3%). The majority of the cases were class II A (n=98, 32.6%), class I A (n=72, 24%), while there were minimal cases in class III B and III C. Conclusion: Recurrent pericoronitis was the most frequently reported reason for surgical removal of mandibular third molars. The postoperative infection rate was 3.6%, though the patient had undertaken antibiotics postoperatively. The use of corticosteroids can decrease the severity of postoperative sequelae in many patients.

Keywords---third molar, impaction, Winter's classification, Pell and Gregory classification, dry socket, trismus.

Introduction

Humans' third molars on the mandible are the most frequently impacted teeth [1]. The primary etiological factors are a lack of space in the dental arch, an abnormal eruption path, and a late eruption sequence [2]. Farman proposed in 2004 that impacted teeth are prevented from erupting due to the presence of a physical barrier in their eruption path. In 1954, Mead defined an impacted tooth as unable to erupt into its proper position due to malposition, insufficient space, or other impediments [3]. Third molars that have been impacted frequently develop pericoronitis, adjacent tooth caries, cystic lesions, neoplasms, and pathologic root resorption [4]. TMJ disorders, crowding of the lower arch, orofacial pain, and neuralgias have all been associated with impacted teeth.

Radiographically, the position of the impacted third molar in the mandible has been classified according to the anteroposterior space between the second molar and the mandibular ramus, its superior-inferior position, its medial-lateral position, and its long axis position [5]. Such classification helps in communication among surgeon's record keeping and treatment planning [6]. Surgical removal is the ultimate treatment for the most impacted mandibular third molars. Many impacted third molars remain asymptomatic for years but are often extracted to prevent future complications and pathologic conditions [7]. Lytte listed the following conditions in which impacted third molars are to be extracted – infection around the impacted tooth, loss of bone around the impacted tooth, dental caries, damage of adjacent teeth, crowding of the dental arch, development of cyst and tumors around the impacted tooth, pre-irradiation removal, chronic facial pain and for prosthetic reasons [8,9]. Surgical extraction of an impacted tooth can be as simple as using forceps or as complex as soft tissue reflection, bone removal, tooth sectioning, tooth luxation and elevation, socket debridement, and wound closure. Before undergoing any procedure, the patient must be informed of the reason for the procedure and the risks involved [10].

The most common complication following mandibular third molar surgery includes a dry socket, infection, sensory nerve damage, hemorrhage and pain [11, 12]. Complications associated with third molar removal occur at a rate of 4.6% to 30.9% and may occur during surgery or in the postoperative period [11,12,13]. Most of the complications are temporary, but paresthesia may become permanent, causing functional problems [14]. Postoperative complications are influenced by different factors such as age, health condition of the patient, gender, tooth impaction level, surgeons experience, smoking, intake of contraceptives, quality of oral hygiene, and surgical technique [11, 13, and 14]

Method

Proper ethical clearance was obtained from the institutional ethical clearance. This retrospective study was undertaken on 300 patients in Thoothukudi Government medical college hospital in the department of dental surgery from July 2019 to February 2020. Patients diagnosed with impacted mandibular third molars and treated surgically under local anesthesia were included in the study. Patients with incompletely formed roots, absence of adjacent second molar were excluded. The variables of the study were obtained through history, clinical and radiographic examination. The position of the impacted tooth was evaluated by IOPA and OPG if required. The data collected were analyzed by applying descriptive statistics.

Discussion

Third molar impaction in the mandible is a common occurrence associated with varying degrees of extraction difficulty and risk of complications [2]. In the universe, third molars erupt between the ages of 17 and 21 years. Additionally, the time of the third molar eruption has been reported to vary by race. Males typically have their mandibular third molar eruption approximately three to six months earlier than females [15]. Third molar eruption and subsequent positional changes cannot be attributed solely to race but also to the nature of the diet, the intensity with which the masticatory muscles are used, and possibly to genetic background [14]. This study also reveals that females are most affected than males due to the period of growth and maturation differs for both genders as females attain maturation earlier than males.

As stated in literature by many authors and in many studies by Linder et al., Hattab et al., and Knutson et al., the maximum number of third molar impactions was mesioangular [16-18]. Mesioangular impactions appear to be the most common type, which may be due to their delayed development and maturation, eruption path, and lack of space in the mandible at a later age [15,19]. In the current study at Thoothukudi government medical college hospital, the percentage of mesioangular impaction is 45%, followed by vertical impaction, which is 33.3%. Our study was similar to the previous reports from Pakistan, the USA, Nigeria, China, Thailand, Spain, Malaysia, Southeast Iran, where mesioangular impaction is the most common impaction of mandibular third molar [20]. But still, some studies state that vertical impactions were the common type followed by mesioangular impaction.

According to the Pell and Gregory classification, the common type of impaction was II A (N=98; 32.6%), followed by class I (n=72; 24%) among Thoothukudi district people. In the study, recurrent pericoronitis was the most frequently cited reason for surgical removal of mandibular third molars. Other studies across the world have also said that pericoronitis is the main reason for extraction, postoperatively, it may cause swelling, pain, Alveolar osteitis, infection, trismus, damage to the lingual and inferior alveolar nerve, dentoalveolar fracture, injury to adjacent teeth, ulcerations, TMJ injury and mandibular fractures [15]. The most common postoperative complication was persistent pain and swelling in the mesioangular, vertical and horizontal impactions, 20%, 16%, and 11.7%, respectively. Injuries to the inferior alveolar nerve are more frequently, the lingual nerve result in numbness and taste disturbances in the ipsilateral anterior two-thirds of the tongue [20]. Due to the molar's anatomical proximity to the nerve, iatrogenic injury to the lingual nerve may occur during third molar surgery [21]. The conventional removal of impacted teeth results in 1.6% -3.3% IAN paralysis and 0.9- 11% lingual nerve paresthesia in all cases. In our study, very minimal of 4 cases among 300 patients were affected by paresthesia.

The majority of localized osteitis occurs in the region of the mandibular third molar. This occurs when the initial clot does not mature and the normal socket healing sequence does not occur. In the present study, dry sockets represented just 3% to 20% of the total complications. Blondeau et al. had reported 3.6% dry socket in their study, while Jaffar et al. had found only 3% in their investigation [8, 10]. Incorporating Plasma rich factor (PRF) as a preventive method for dry socket results in a 90% reduction of dry socket after third molar surgery.

The postoperative infection rate is reported to be varied from 1.5% to 5.8% [15]. In the present study, the postoperative infection rate was 3.6% though the patient had undertaken antibiotics postoperatively. Anti-inflammatory therapy is necessary to control postoperative inflammation and associated symptoms. Corticosteroids can significantly reduce the severity of postoperative sequelae in a large number of patients [10]. It seems female patients show high complication rates. Postoperative edema in female patients is significantly higher (12.7%) than in male patients (1.4%).

Male patients had a significantly higher prevalence of cysts or tumors than female patients. (M: F; 3.29:1). Among all pathological conditions, the prevalence of cysts or tumors associated with impacted third molars ranges from 2 to 6.2% [22].

There is some relation between the position of the tooth and the appearance of postoperative complications. Distoangular and vertical impaction had the highest number of complications in the current study. Similarly, our results also showed that Class III C, III B, and III-A had the highest complication rates.

Results

Among 300 patients, 168 were female and 132 were male. The age of patients ranged from 18 to 60 years. The most common age group involved were from 21 to 30 years (n=164, 54.6%), followed by the fourth decade (n=67, 22.3%). The most common type of impaction was mesioangular (n=135, 45%) followed by vertical (n=100, 33.3%) and horizontal impaction (n=34, 11.3%). The majority of the

cases were class II A (n=98, 32.6%), class I A (n=72, 24%), while there were minimal cases in class III B and III C.

The most common postoperative complication was persistent pain and swelling in mesioangular, vertical and horizontal impactions, 20%, 16%, 11.7%, respectively. Trismus and dry socket have an equal frequency of occurrence (15%) and it was common in mesioangular followed by horizontal impactions.

Pain and swelling were common in III A (30%), followed by III B (25%). Complications like dry socket were common in IIIA, I A, and IIA, whose percentile was 20%, 6.9%, and 3%. Trismus was more in class IIIB (25%) class III A (10%) and class I B (8.8%). Paresthesia was least common in both types of impactions (n=4 among 300 patients).

Table 1
Age Distribution of Patients

age groups (years)	number of patients	percentage (n = 300)
11-20	28	9.3%
21-30	164	54.6%
31-40	67	22.3%
41-50	33	11.0%
Over 50 years	8	2.6%

Table 2
Position of Impacted Mandibular Third Molar

Angulations	No.of Patients	Percentage (N= 300)
Mesioangular	135	45%
Vertical	100	33.3%
Horizontal	34	11.3%
Distoangular	23	7.6%
Others	8	2.6%

Table 3
Distribution of Impacted Mandibular Third Molars According to the Depth and Width of Impaction (N= 300 Pell And Gregory Classification)

Classification	I A	I B	I C	Ii A	Ii B	Ii C	Iii A	Iii B	Iii C
No.of Patients	72	34	9	98	63	7	10	4	3
Percentage	24%	11.3%	3%	32.6 %	21%	2.3%	3.3%	1.3%	1%

Table 4
Post Operative Complications According to Winters Classification According To Position of Impaction

Post-Operative Complications	Mesioangular N=135	Vertical N = 100	Horizontal N = 34	Distoangular N = 23	Others N = 8	Total N = 300
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Pain&Swelling	27	16	4	4	2	53 (17.6%)
Dry Socket	6	4	2	2	1	15 (5%)
Infection	4	1	3	3	0	11 (3.6%)
Trismus	5	2	4	2	2	15 (5%)
Paresthesia	0	0	2	2	0	4 (1.3%)
Ulceration	3	2	2	1	1	9 (3%)
Total	45	25	17	14	6	107 (35.6%)

Table 5
The Postoperative Complications Regarding Width and Depth of Impaction (Pell & Gregory Classification) N= 300

Postoperative Complications	Degree Of Impaction					
	I A	I B	I C	li A	li B	li C
Pain And Swelling	15	5	2	16	10	1
Dry Socket	5	2	0	3	2	1
Infection	2	1	0	5	3	0
Trismus	2	3	0	5	3	0
Parasthesia	0	0	0	2	0	0
Ulcerations	2	1	0	2	2	0
Total	26	12	2	35	20	3

Table 6
Postoperative Complications According to the Degree of Impaction

Postoperative Complications	Degree Of Impaction			
	lii A	lii B	lii C	Total
Pain And Swelling	3	1	0	53 (17.6%)
Dry Socket	2	0	0	15 (5%)
Infection	0	0	0	11 (3.6%)
Trismus	1	1	0	15 (5%)
Parasthesia	0	0	2	4 (1.3%)
Ulcerations	1	0	1	9 (3%)
Total	7	2	3	107 (35.6%)

Conclusion

To conclude, recurrent pericoronitis was the most frequently reported reason for surgical removal of mandibular third molars. In the present study, the postoperative infection rate was 3.6%, though the patient had undertaken antibiotics postoperatively. The use of corticosteroids can decrease the severity of postoperative sequelae in many patients. Postoperative edema in female patients is significantly higher (12.7%) than in male patients (1.4%).

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