

Prevalence of Impacted Teeth: Study of 500 Patients

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Abstract: Objectives: To assess the prevalence of different pattern of impacted teeth. Materials & Method: A retrospective study of the digital orthopantomograms of 500 patients from Dept of Oral & Maxillofacial Surgery, Rajarajeswari Dental College & Hospital, Bangalore was carried out. The investigation was done to relate the impaction to the angulation of tooth, age, and sex. Result: Panoramic radiographs of 500 patients aged 18 to 35 years were examined. The prevalence of teeth impaction was 33.6% among this age distribution. Two hundred twenty four impacted tooth were found. Mandibular right third molars were the most commonly encountered impactions 67 (29%). The distal angulations was the most common pattern of impaction in case of mandibular whereas mesio-angular was the common variant of maxillary third molar. Incidence of impaction is more common to 22 to 26 year age (42.8%). Conclusion: In our study impaction was more commonly seen in younger population. The mandibular third molars were the most frequently impacted in distoangular orientation whereas maxillary third molar were mesioangular.

Keywords: impaction, third molar, mesioangular, distoangular, maxillary, mandibular

1. Introduction

An impacted tooth is that, which is prevented from erupting into the dental arch by overlying gum, bone or another tooth (1). It was defined by various authors in various ways throughout the years. The term impaction is derived from Latin word "impactus", which mean an organ or structure which because of an abnormal mechanical condition has been prevented from assuming its normal position, "The condition in which a tooth is embeded in the alveolus so that its further eruption is prevented" (Rounds, 1962). Any permanent tooth can be impacted. It can be defined as – "a tooth which fails to erupt into its anatomical position beyond its expected chronological time and is positioned against another tooth or bone or soft tissue so that its further eruption is unlikely" (Archer, 1975). Several systemic and local factors may cause tooth impaction (2). The causes of impaction is divided into two broad category – local & systemic (3).

Local causes (Burger):

- Lack of space
- Retained deciduous teeth
- Premature loss of deciduous teeth
- Ectopic position of tooth bud
- Obstruction of eruption path
- Cyst tumor and supernumery teeth
- Infection and trauma
- Abnormality of jaw
- Dilaceration

Systemic causes (Burger):

- Prenatal causes
 - Heredity
- Postnatal
 - Rickets

- Anaemia
- Congenital Syphilis
- Endocrine dysfunction
- Malnutrition
- Rare conditions
 - Cleidocranial dysostosis
 - Oxycephaly
 - Progeria
 - Anchocondroplasia
 - Cleft plate

The classification of impaction is described in different studies by several methods, such as level of impaction and angulation. Most accepted classification for impacted third molar was given by Pell & Gregory (1933) and Winter (1926) and for impacted canine tooth was given by Archer. Tooth impaction was considered if the tooth was not in functional occlusion. The angulation was assessed by measuring the angle formed between the long axis of the impacted tooth relative to the long axis of the teeth adjacent to it. Different angulations of impaction are present: mesioangular, distoangular, horizontal, vertical and bucco-lingual [figure-1]. Different level of impaction is considered according to the occlusal height and amount of distal bone covering the distal portion of tooth (4). Several complications may result due to tooth impaction, such as, caries, periapical lesions, periodontal disease, temporomandibular joint disorder, root resorption of adjacent teeth and oral cysts and tumors (5). Management and diagnosis are important to both patient and surgeon. Panoramic radiograph and computed tomography are used to provide accurate localization for diagnosis and treatment of impacted teeth.

The aim of our study was to evaluate the prevalence and pattern of teeth impaction according to angulation of

impaction, age, and sex in patients reported in Rajarajeswari Dental College & Hospital by using panoramic radiographs.

2. Materials & Method

A retrospective study of patient's digital OPG, who reported to Dept of OMFS was done. Sample size was 500, the age group for the study was 18 years to 35 years. Exclusion criteria were patients who have had surgical extraction of impacted teeth, who are completely edentulous and those who do not have a panoramic radiograph. Following the radiographic evaluation, patient's records were reviewed in terms of age, sex and presence of teeth impaction.

3. Results

Panoramic radiographs of 500 patients aged 18 to 35 years were examined: 265 male and 235 female patients. A total of 168 (33.6%) patients presented with at least one impacted tooth. 224 number of impacted teeth are found. There was no significant difference among males (47%) compared to females (53%) for predilection to impacted teeth [figure-2]. Incidence of impaction is more common to 22 to 26 year age (42.8%) [figure-3].

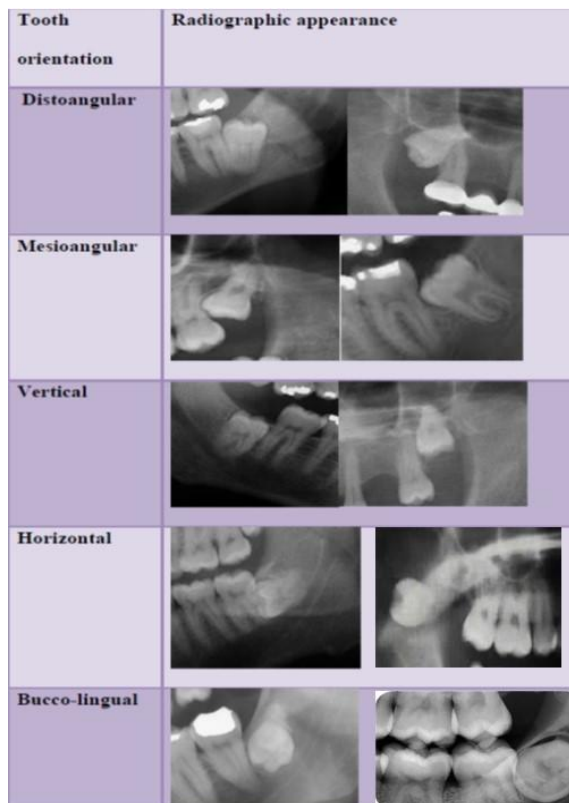


Figure 1: different angulation of impacted teeth in maxillary and mandibular arch

In our study 224 impacted teeth were found, of those: mandibular right third molars were most commonly encountered 67 (29%), followed by mandibular left third molars 59 (27%). 45 (20%) for maxillary right and 40 (18%)

for maxillary left third molars, 6 (3%) maxillary right canine, 4 (2%) maxillary left canine, 2 (1%) mandibular right first premolar, and 1 (0.5%) mandibular left first premolar were present [figure-4]. Analysis of the orientation of the impacted tooth showed that distal angulations was the most common pattern of impaction in case of mandibular whereas mesio-angular was the common variant of maxillary third molar [table-1]. Analysis of position of tooth in relation to the occlusal level of adjacent tooth shows that maxillary third molars have more Class A relation where mandibular third molars showed more Class II relation [table-2]. In case of mandibular third molar position B was more common pattern [figure-5].

4. Discussion

The frequency and etiology of teeth impaction has been investigated in many different studies. Several factors were reported as possible causes for impaction: including lack of space; early physical maturation; and delayed mineralization (6) (7). This study was done to determine the prevalence of impacted teeth according to angulation of impaction, sex, and age. The age of patients selected was between 18 to 35 years of age. As by the age of 18 development of third molar teeth and by the age of 21, growth is essentially completed and will allow involvement of all impacted teeth including third molars.

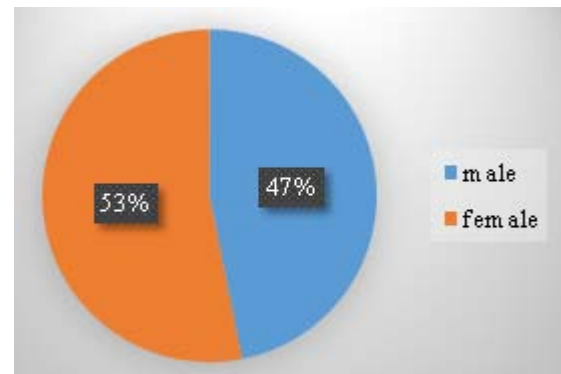


Figure 2: male female ratio

Table 1: angulation of maxillary and mandibular 3rd molar

Mandibular 3 rd molar	#38	(%)	#48	(%)
mesioangular	15	25%	17	25%
distoangular	17	29%	20	30%
horizontal	11	19%	13	19%
vertical	10	17%	10	15%
buccal/lingual	6	10%	7	11%
Maxillary 3rd molar	#18	(%)	#28	(%)
mesioangular	15	33%	14	35%
disto-angular	13	29%	10	25%
horizontal	5	11%	9	22%
vertical	8	18%	5	13%
buccal/lingual	4	9%	2	5%

The difference in teeth impaction between males (47%) and females (53%) was not that much significant. Though in several articles it was revealed that higher frequency among

females than males. The majority of patients (43%) with single or multiple impacted teeth were within 20 to 28 years old. Ventä I et al. reported continues clinical changes of third molar until the age of 32. The prevalence of impaction is reduced as the age increases. This phenomenon is probably due to increased extraction of impacted teeth in older patients (8). In dentistry, the most common surgical intervention is extraction of third molars in patients 20 years and older (9). The need for prophylactic removal of impacted third molar due to incidence of pathologic conditions associated with the impaction remains a controversy (10).

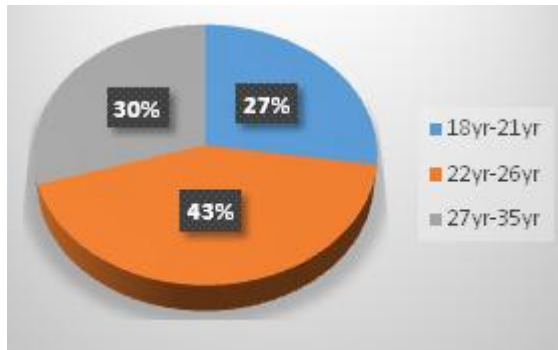


Figure 3: most common age group for impaction

Table 2: occlusal relationship of maxillary and mandibular 3rd molar

Maxillary third molar	#18	(%)	#28	(%)
class A	21	47%	18	45%
class B	13	29%	12	30%
Class C	11	24%	10	25%
Mandibular third molar	#38	(%)	#48	(%)
class I	19	32%	23	34%
class II	32	54%	31	46%
Class III	8	14%	13	20%

Recent literature related to third molars recommend observation of asymptomatic impacted wisdom teeth instead of prophylactic removal as the appropriate treatment, because some impacted third molar erupt after the age of 18, and low incidence of pathology associated with impaction (8). Main importance of this study was to evaluate the frequency of impaction per tooth type: third molars, canines and premolars and incisors. In our study: mandibular right third molars were most commonly encountered 67 (29%), followed by mandibular left third molars 59 (27%), 45 (20%) for maxillary right and 40 (18%) for maxillary left third molars, 6 (3%) maxillary right canine, 4 (2%) maxillary left canine, 2 (1%) mandibular right first premolar, and 1 (0.5%) mandibular left first premolar were present [figure-4]. The impaction of the canine is worthy of attention because the canine has an essential role in occlusal stability and esthetics. Maxillary canine impaction is more frequent than mandibular canine impaction and is the second most frequently impacted tooth after third molars (11).

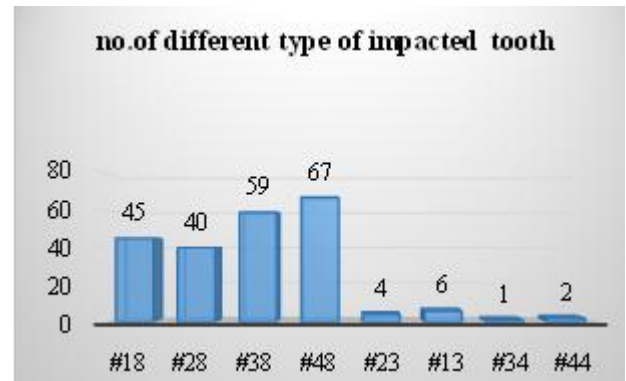


Figure 4: different pattern of impacted tooth distribution

In our study, the prevalence of maxillary canine impaction was 5%, but in our study we did not find any mandibular impacted canine. Lower premolars have a tendency of impaction. A few cases of mandibular second premolar impaction as reported by McNamara et al (12). However in our study impaction of first mandibular premolars was 1.5% and no central or lateral incisors impaction was found.

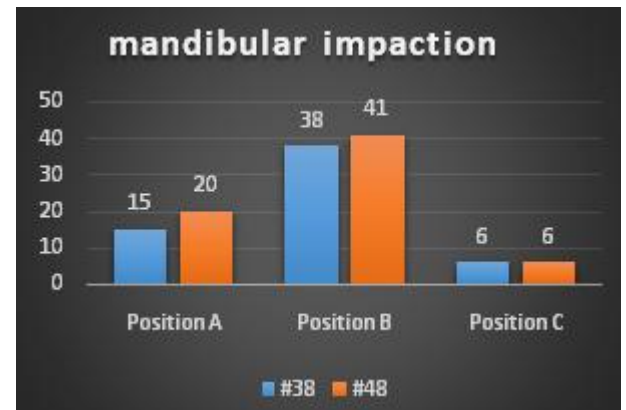


Figure 5: relation to ramus of mandibular 3rd molar

5. Conclusion

The teeth impaction was more commonly seen in younger population. The mandibular third molars were the most frequent impacted teeth. The most common orientation of teeth impaction was the distoangular orientation for mandibular teeth and mesioangular orientation for maxillary teeth.

6. Ethical Approval

This article does not contain any studies with human participants performed by any of the authors.

7. Conflict of Interest

There is no conflict of interest.

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