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Incidence of impacted third molar: A radiographic retrospective study in Modinagar Semirural Population

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Abstract

Introduction: Tooth impaction is a pathological situation in which a tooth is failed to attain its normal functional position. Incidence of impacted third molars is more common in the mandible (90%) than the maxilla followed by maxillary canines and mandibular second premolars.

Aim: The aim of this study was to assess the incidence of mandibular impaction as compared to maxillary impaction based on age group and gender predilection in Ghaziabad Semi-Rural population. The incidence of distal caries in second molar was also evaluated based on the angulation of impacted third molar.

Material & method: A sample of 1500 radiographs (OPGs and IOPA) were retrieved from a digital archive were taken. The age group, gender and angulation of the impacted third molars were tabulated for statistical evaluation. Based on the age, sample was divided into three category, Category 1- 18-25 years, Category 2- 26-35 years and Category 3- 36-50 years. And the angulation was assessed on the basis of Winter's Classification of impacted third molars.

Result: In our study, 29% were maxillary impactions and 71% were mandibular impactions. Based on the age group, the impactions were maximum in category-1. On the basis of gender, males had preponderance in case of mandibular impactions. According to Winter's classification, both in maxillary and mandibular

impactions the incidence of vertical impactions were more. There was an incidence of distal caries in second molar due to the presence of mesioangular third molars.

Conclusion: The patients of Modinagar semi-rural population had an incidence of mandibular impactions in males with predominance of vertical impactions. Second molar distal caries justifies the prophylactic extraction of mandibular third molars. The incidence of mesioangular impacted third molar is more for distal caries in second molar.

Keywords: Mandibular, Maxillary, Impaction, Age, Gender, Distal caries, Second molar

Introduction

The term impaction is defined by Peterson in 1998 as a tooth that fails to erupt into dental arch within expected time[1]. Tooth impaction is a pathological situation in which tooth is failed to attain its normal functional position[2]. Incidence of impacted third molar is more common in mandible (90%) than maxilla followed by maxillary canines and mandibular second premolars[3]. These impacted teeth may stay asymptomatic for a long time without creating disturbance for patient or may present with various pathologies like caries, pericoronitis, cysts, neoplasms and also causes root resorption of adjacent tooth[4]. Earlier studies have shown that the incidence of impacted third molar is more in females than as compared to males[5].

Caries may also be develop in clinical situations where no obvious communication exists between the oral cavity and impacted tooth while in partially impacted teeth occlusal and proximal sides are most commonly affected[6]. The tooth position and inclination play main role in caries development process. In]]]]][[ooase of partially exposed mesioangular and horizontal mandibular third molars, occlusal surface forms plaque accumulative crevices against the distal surfaces of the second molars leading to development of distal caries in the second molars[7].

The aim of this study was to assess the incidence of mandibular impaction as compared to maxillary impaction based on age group and gender predilection in Modinagar semirural population. The incidence of distal caries in second molar was also evaluated based on angulation of the impacted third molar.

Material and method

Patient sample

Samples of 1500 radiographs (OPGs and IOPARs) were retrieved from digital archives which were not specifically advised for third molar symptoms. Radiographs were evaluated retrospectively for the impacted third molar based on Winters classification. The age group, gender and angulation of the impacted third molars of Modinagar, semirural population was tabulated for statistical evaluation.

The population was divided into male and female and into 3categories on the basis of age group which were 18-25 years, 26-35 years,36-50 years.

Based on Winter's classification, the impacted teeth were classified as All good quality radiographs from patients aging between 18 -50 years of age, either IOPAR depicting complete picture of the third molar or OPG were assessed in study and classified according to Winters classification as mesioangular, horizontal, distoangular, and vertical impactions. Patients not belonging to concerned demographics were excluded.

Results

Based on Sex Distribution

Males comprised of 822(54.8%) and females were 678(45.2%) in this sample size

Based on maxillary and mandibular impaction

In the study 435 (29%) were maxillary impaction and 1065(71%) were mandibular impactions in this sample size

Based on age groups

Category 1 - 957 impactions - 273 maxillary and 684 mandibular impactions

Category 2 - 621 impactions - 189 maxillary and 432 mandibular impaction

Category 3 – 267 impactions - 72 maxillary and 195 mandibular impaction

The side of impaction based on age group was also assessed.

Incidence of mandibular impactions was more as compared to mandibular impactions in all 3 age groups. Maximum incidence was seen in case of category 1. Incidence of mandibular right impactions was more than left mandibular impaction in category 1. Incidence of maxillary left impaction was more than the right side in category 1. In maxillary third molars, in all age groups, vertical impactions were the highest. In mandibular third molars, in all age groups, vertical impaction had highest incidence.

Based on gender

Maxillary impactions in males were less as compared to females (48% and 52% respectively). Mandibular impactions in males were more than females (54% and 46% respectively). In males, impacted maxillary third molars on the right side were 51% and left side was 49%. In females, impacted maxillary third molars on right side were 46% and left side was 54%. In males, impacted mandibular third molars on the right side were 48% and left side were 52%. In females, impacted mandibular third molars on right side were 45% and left side were 55%. In males according to winter's classification, incidence of vertical impactions was more both in cases of maxillary and mandibular impacted third molars. In females, the incidence of vertical impactions was more both in cases of maxillary and mandibular third molars.

Based on bilateral/unilateral impaction

The numbers of unilateral and bilateral impactions in maxilla were 249 and 285 respectively. The numbers of unilateral and bilateral impactions in mandible were 867 and 438 respectively.

Based on incidence of carious 2nd molar

Incidence of caries in second molars in the total sample as evaluated in figure 6 showed 62% carious second molar in association with impacted third molars. On the basis of age, the incidence of distal caries in second molars were evaluated which showed maximum incidence in category 1. Based on winters classification, incidence of distal caries in second molar were highest in mesioangular impactions (46%) (Figure 1).

Discussion

Impacted teeth are the teeth that fail to erupt in the dental arch. The tooth may become impacted because of adjacent teeth, dense overlying bone or soft tissue, lack of space in jaw, aberrant path of eruption, abnormal positioning of tooth bud or pathological lesions. The age of impacted tooth ranges from 17-25 years. In our study age ranges from 18-50 years where incidence of maximum impacted teeth was seen between 18-25 years.

A study by Quek et al[5], Wahid et al[9], stated that there was a prevalence of females in impactions over males. Nazir et al showed male preponderance of 54%. Literature has shown no gender predisposition in Caucasian, Chinese, Negro, and Arabian community. Previous studies reported the occurrence of third molar impaction in Caucasian females[5]. Our study is in

agreement with this study which showed a male preponderance of 55%

A study done in Pakistan showed arch wise distribution of impacted third molar showed greater disposition in mandible than maxilla[11]. Venugopal conducted a comparative study on impacted third molar in south India which showed greater predilection towards the mandible, which also supports our findings [12]. Hashemipour studied the Iranian population and concluded that impactions in mandible are 1.9 times more likely to occur as compared to mandible. Our study is in agreement with the literature which states that mandibular third molar impactions were more than their maxillary counterparts.

On basis of angulation of impaction, our study showed that maximum vertical impactions were seen in the maxillary impacted third molars. This was in accordance with the literature[5,9]. However Kata et al suggested that maxillary incidence is more as compared to mandible[11].

In case of mandible vertical impactions were common. This is not in agreement with the referenced literature[9, 14]. Both Wahid et al and Valmaseda-Castellon et al showed that there was mesioangular predominance as compared to vertical. Hasheimpour showed that the most leading impaction in mandible was mesioangular followed by horizontal, vertical and distoangular impaction. Literature does not show any wide variation in angulation of impaction of third molar in relation to race. In this context Kanneppady conducted comparative study on Malaysian different ethnic group, which showed mesioangular impaction was more frequent (49.8%) followed by distoangular (22.9%) [15].

Several complications associated with extraction of mandibular third molar including alveolitis, infection and paraesthesia of inferior alveolar nerve. Francois and Nach showed higher complication rate in mesioangular and distoangular impaction than the rest of the other positions [16].

Third molars are the most common impacted teeth and pericoronitis associated with bad oral hygiene and lesser self-cleansing area lead to food accumulation resultantly leading to increase in microbial load. According to Adeyemo et al, the major reason for third molar extraction was caries and its sequelae (63.2%), followed by recurrent pericoronitis (26.3%) and periodontitis (9.2%) [17]. Allen et al reported incidence of 42% of the distal second molar caries associated with partially or completely impacted mandibular third molars [18]. The results of Bataineh et al showed 0.5% in the second molars associated with third molars[19]. In a study by Ustad F et al 20% incidence of caries was reported in the distal surface of the second molar, and 85% of this incidence was due to mesioangular impacted third molar[20]. In our study 38% of distal caries was seen in the second molars and 46% was due to mesioangular impacted third molars.

Conclusion

The patients of Muradnagar semirural population had an incidence of mandibular impaction in male with predominance of vertical impactions. Second molar distal caries justifies the prophylactic extraction of mandibular third molars. The incidence of mesioangular impacted third molar is more for distal caries in second molar.

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Legends Figure

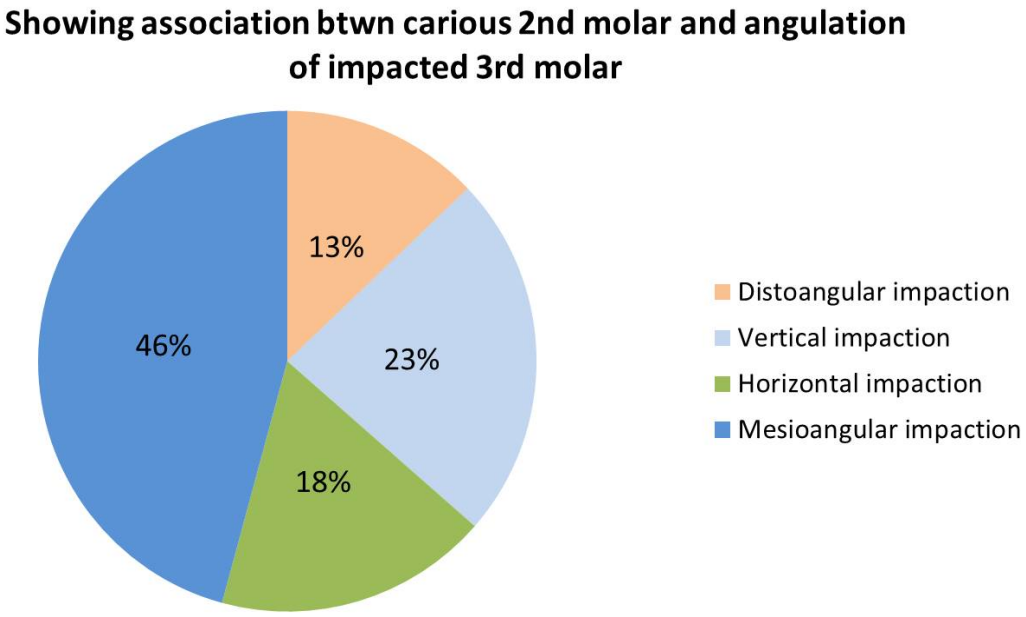

Fig 1: incidence of carious 2nd molar