

Incidence of Agenesis, Impactions, Angular Positions and Pathologies Related to Third Molar Teeth

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Abstract:**Aim:**

The aim is to investigate the frequency of third molar agenesis, impactions, their angular positions and pathologic changes associated with it.

Objective:

Third molar agenesis is due to genetic changes as well as modification of skull sizes in the course of evolution. This is also the reason for third molar impaction due to lack of space for eruption into the oral cavity. Sometime it lies horizontally over the preceding second molar tooth causing infection in it as well. The angular positions of third molar can be mesioangular, distoangular, vertical or horizontal. Also long term retained impacted third molars can be potentially pathologic. This study will determine the frequency of agenesis and impactions.

Materials and methods:

The sample consists of 122 orthopantomograms of patients in which the pattern of third molar eruption and position were evaluated.

Results :

Agenesis of third molar is less (8%). Impaction is most commonly seen in mandible. Mesioangular is the commonest pattern of impaction.

Keywords: third molar, agenesis, impaction, pathologic changes

INTRODUCTION:

Third molar, also called the “the wisdom tooth”, is the last tooth to erupt in the oral cavity by the age of 18-23 years. Agenesis of third molar can be due to genetic changes like mutations of genes like Unclustered Hox and Homeobox genes. It can also because of changes in dietary habits. [1] Also impaction of third molar is very common. Impaction can be defined as the cessation of eruption of a tooth caused by a physical barrier or ectopic positioning of tooth. An impacted tooth is the one that is erupted, partially erupted or unerupted and will not eventually assume a normal arch relationship with the other teeth and tissues. There are two theories for the etiology of impaction of third molar teeth.[2] The first theory is Phylogenic theory which states that due to evolution, there have been variations in sizes of the skull. Thus human jaw has become smaller and as the third molar is last to erupt, it generally cannot erupt normally in occlusion with the opposing tooth and ends up being out of occlusion, unerupted, impacted in various angulations. The Mendelian theory states that if an individual genetically receives smaller jaw from one parent can cause impaction due to lack of space to erupt in proper position.

The local causes for impaction of third molar can be any obstruction for eruption like adjacent tooth or density of overlying bone, ankylosis of primary or permanent teeth, over-retained deciduous teeth, non absorbing alveolar bone, ectopic position of tooth bud, dilacerations of roots, associated soft tissue or bony lesions. Systemic causes can be prenatal causes, postnatal causes like rickets, anaemia, tuberculosis, congenital syphilis, malnutrition; endocrinal disorders of thyroid, parathyroid, pituitary glands like hypothyroidism, achondroplasia; hereditary linked

disorders like Down’s syndrome, Hurler’s syndrome, osteopetrosis, Cleidocranial dysostosis, cleft palate etc.[3] Long retained impacted third molars can be affected by dental caries and periodontal problems due to inability of the patient to maintain proper hygiene in that area. So this study aims to evaluate the incidence of agenesis, maxillary and mandibular third molar impactions and their angulations with the help of radiographs.

MATERIALS AND METHODS:

The study was conducted by collecting orthopantographs (OPG) from the Department of Oral Medicine and Radiology, Saveetha dental college, chennai, india for 122 patients (61 males + 61 females).

The OPGs of patients of the age of 18 and above are included. They were analysed with radiographic viewer and magnifying lenses.

The radiographs are interpreted for the following:

1. Agenesis of third molars
2. Impaction of maxillary and mandibular third molar teeth
3. Angular positions of impactions
4. Pathologies associated with impacted teeth

The pattern of eruption is determined by measuring the angle formed between the lines intersecting the long axis of the second and third molars in maxilla and mandible. The long axis runs through the midpoints of the occlusal surface and bifurcation. The angle formed is used to interpret the mesial and distal angulation of third molars in relation to second molars. When the third molar has reached the occlusal plane level of second molar it is said to be normal erupted teeth. When the angulation exceeds 65 degree, it is considered as horizontal impaction.

RESULTS:

122 male and female patients were evaluated. There is no significant sexual predisposition seen in the prevalence of impaction or agenesis of third molar teeth.

Agenesis is less frequently seen, about 8% in which it is more prevalent in females (10%) than in males (7%).

Impaction is mostly seen in mandible (77.4%) than in maxilla (35.7%).

Mesioangular impaction is most common angular position (65%) especially seen mandible. It is mostly seen in males about 80% while in female it is 52%.

Distoangular impaction is seen 6% in males and 11% in females.

Vertical impaction is 24% out of all angulations in which 14% is seen in males and 31% is seen in females.

Pathologies are mostly seen in mandible around 12% and in maxilla 6%.

GENDER DISTRIBUTION:

Gender	Agenesis		Impaction	
	N	%	N	%
Females	22/244	9.1%	136/214	63%
Males	17/244	7%	114/225	50%

Gender	Mesioangular impactions	Distoangular impactions	Vertical impactions
Females	52%	11%	31%
Males	80%	6%	14%

SITE DISTRIBUTION:

Sites	Mesioangular	Distoangular	Vertical	Pathologies
Maxilla	34.6%	16.6%	48.7%	6%
Mandible	70.3%	5.8%	23.8%	12%

DISCUSSION:

Celikoglu et al [4], Ananthalakshmi Ramamurthy et al [5] conducted studies to evaluate the prevalence of mandibular third molar impaction and agenesis using radiographs.

The study was to investigate the incidence of agenesis, impactions and their angular positions and pathologies associated with it. 122 patients were evaluated for the position and condition of their third molars using orthopantomograms (OPGs). Third molar agenesis was found in 8% of the patients. The cause may be genetic like gene mutations, change in lifestyle and dietary habits or lack of eruptive force due to certain disorders.

Impaction due to lack of space can cause crowding of anterior teeth, resorption of adjacent tooth roots and dental caries in adjacent teeth, infections like pericoronitis and temporomandibular joint dysfunction. Sandhu et al have done a similar study on Asian-Indian students. [6]

Sex is not a predominant factor in occurrence of impaction. In this study, 63% of females while 50% have impactions.

The impaction of third molar can be characterised by angulations due to the lack of space. Mesioangular impaction is seen more in males about 80%. In females, 52% have mesioangular impaction. The rate of distoangular impactions is 11% in females and 6% in males. Vertical impactions are found to be 31% in females and 14% in males.

According to occurrence in maxilla and mandible, mesioangular impactions of third molars are most commonly seen followed by vertical and distoangular. Mesioangular is found to be more in mandible, about 70.3% than in maxilla which is only about 34.6%. Distoangular and vertical impactions is found to be more in maxilla about 16.6% and 48.7% respectively, while in mandible 5.8% and 23.8% respectively.

Pathological changes are mostly seen in mandible about 12% than in maxilla which is about 6%.

Hattab et al in their study on Jordanian students found mesioangular impactions of mandibular third molar teeth to be very common. [7] Geethu et al found similar results in their study on Kenyan patients. [8]

Dachi et al in their study examined 3874 full mouth radiographs and presented varying results. [9]

CONCLUSIONS:

From the above study, it can be concluded that:

1. Agenesis of third molars is very less among the population, only about 8%.
2. Impacted teeth are commonly seen in females especially in mandible.
3. Mesioangular impactions are more common in population.
4. Mesioangular impactions are seen generally in males.
5. Pathologies associated with impacted third molars are generally seen in mandible.

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