



MOST COMMON IMPACTED TEETH IN MALES REPORTING TO UNIVERSITY DENTAL SETUP IN CHENNAI

Maxillofacial Surgery

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ABSTRACT

Introduction: Impacted teeth are defined as teeth that remain completely or incompletely embedded within the jawbone or mucosa for 2 or more years following physiological eruption time. There is wide variation in impacted teeth among individuals. Hence the aim of the study is to assess the most common impacted teeth in males reporting to a university dental setup in Chennai. **Materials and methods:** The data of male patients reporting to Saveetha Dental College and Hospitals was reviewed and patients with impacted teeth were selected for the study. It included parameters - age, and impacted teeth. Frequency test was used to detect the significance between age and impacted teeth. Chi square tests were carried out using age as independent variable and implicated teeth as dependent variable. The statistical analysis was done by Pearson chi square test. P value < 0.05 was considered statistically significant. **Results and conclusion:** The most common impacted teeth were found to be mandibular third molars and the most common age group was found to be 21-40 years. The Chi square test value was found to be statistically significant (0.001)

KEYWORDS

Impaction, Eruption, Diagnosis, Angulation

INTRODUCTION :

Impacted teeth are defined as teeth that remain completely or incompletely embedded within the jawbone or mucosa for 2 or more years following physiological eruption time.(1)

Although there is wide variation in impacted teeth among individuals, Studies have shown the mandibular last molar to be the most commonly impacted tooth followed by the maxillary third molars, the maxillary canines and the mandibular premolars. (2)

Although there is wide variation in impacted teeth among individuals, Studies have shown the mandibular last molar to be the most commonly impacted tooth followed by the maxillary third molars, the maxillary canines and the mandibular premolars. (1) Impaction of the incisors is relatively rare compared to the other teeth and when present the cause is often a retained deciduous tooth or the presence of another abnormality like an odontoma. Multiple impactions are in most instances seen in association with some syndromes such as cleidocranial dysostosis, Gardner's syndrome, Gorlin-Sedano syndrome and Yunis-Varon syndrome.(3-5) The common systemic factors that cause tooth impaction are such cleidocranial dysplasia, mongolism, febrile diseases, and endocrine deficiencies. (6)

It is important to understand the role of impactions of different teeth in the etiology of various types of malocclusions, which can affect the movement of teeth, functional occlusion, and esthetic smile. For example, the impaction of maxillary canine can increase the risk of root resorption of adjacent lateral incisors, gingival infections, and cystic follicular lesions.(2,7) It is known that the canine impaction is one of the most prevalent dental anomalies. After impacted third molars, maxillary permanent canines are the most commonly impacted teeth. The incidence of maxillary canine impaction is 20 times higher than mandibular canine impaction.

Local factors that cause tooth impaction are supernumerary teeth, dense overlying bone, prolonged primary tooth retention, malposed tooth germs, odontogenic tumors, cleft lip and palate, and due to lack of space in the arch and lies deep into the buccal vestibule. (8,9) This can occur due to ectopic migration of the canine or shifting of the midline of the maxillary dentition causing insufficient space for the canine to erupt. A canine placed high in the vestibule requires a substantial amount of tooth movement to be brought into alignment. Since the canine root in such a situation lies close to the cortical bone of the maxilla the vascularization is compromised. (10) This results in delayed bone remodelling during tooth movement. Hence, very light orthodontic force should be applied. Through the careful usage of this force delivering auxiliaries, the movement of teeth can be controlled and the desired tooth movement can be achieved. Various local and

systemic factors like age, nutrition, consumption of drugs, etc seem to affect orthodontic tooth movement.(11)

General complications may result due to tooth impaction, such as caries, periapical lesion, periodontal disease, TMJ disorder, root resorption of adjacent tooth, loss of alveolar bone and oral cysts and tumors.(6,8)

In terms of timely diagnosis, it's often difficult to work out whether the missing teeth are actually impacted or delayed, especially in young patients. Hence, the detailed assessment of impacted teeth for its location, angulation, and orientation is vital for treatment planning.

Our team has extensive knowledge and research experience that has translated into high quality publications. (12-31)

Hence the aim of the study is to assess the most common impacted teeth in males reporting to a university dental setup in Chennai.

MATERIALS AND METHODS:

Study Design And Study Setting:

The present study was conducted in a university setting (Saveetha dental college and hospitals, Chennai, India). Thus the data available is of patients from the same geographic location and have similar ethnicity. The retrospective study was carried out with the help of digital case records of 1346 patients who reported to the hospital. Ethical clearance to conduct this study was obtained from the Scientific Review Board of the hospital.

Sampling:

Data of 1346 patients were reviewed and then extracted. All patients with impacted teeth in the given duration of time period were evaluated. Only relevant data was included to minimize sampling bias. Simple random sampling method was carried out. Cross verification of data for error was done by presence of additional reviewer and by photographic evaluation. Incomplete data collection was excluded from the study.

Data Collection:

A single calibrated examiner evaluated the digital case records of patients who reported to Saveetha Dental College from June 2019 to June 2021. For the present study, inclusion criteria was data of patients with impacted teeth. Data obtained were age and impacted teeth number. All obtained data were tabulated into Microsoft excel documents.

Statistical Analysis:

The collected data was tabulated and analysed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Vancouver

style) and results were obtained. Categorical variables were expressed in frequency and percentage. Chi square test was used to test association between categorical variables. Chi square tests were carried out using age as independent variable and impacted tooth number as dependent variable. The statistical analysis was done by Pearson chi square test. P value < 0.05 was considered statistically significant.

RESULTS:

In our study, majority (78%) of the patients with impacted teeth were found to be in the age group of 21-40 years. (Figure1) The most common impacted teeth were mandibular third molars accounting for approximately 90%. (Figure2) On associating age with the impacted teeth, mandibular third molars were the most commonly impacted teeth in the age group from 21-40 years of age. (Figure3) The Chi square test value was found to be statistically significant. (0.001)

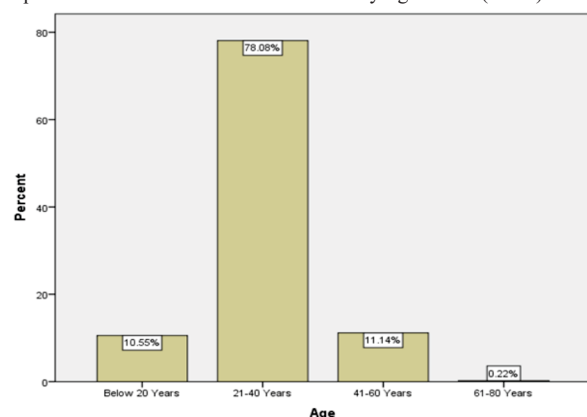


Figure1: This graph represents the distribution of patients based on age. X-axis denotes the age groups and Y-axis denotes the percentage of patients.

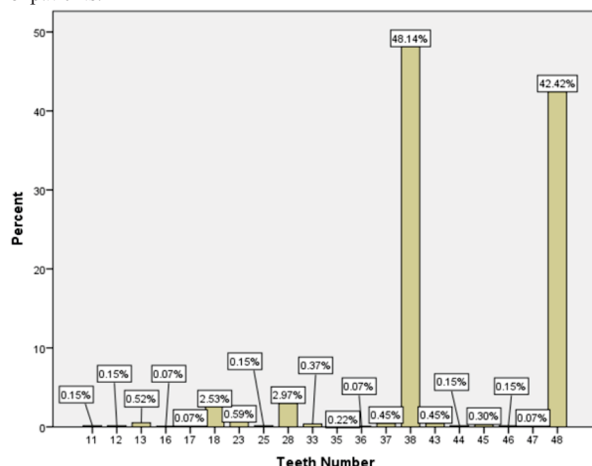


Figure2: This graph represents the distribution of patients based on impacted teeth. X-axis denotes the teeth number and Y-axis denotes the percentage of patients.

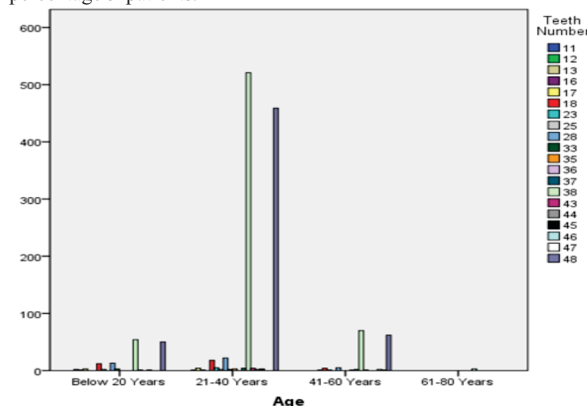


Figure3: This graph represents the association of age with the

impacted teeth. X-axis denotes the different age groups and Y-axis denotes the number of patients. Mandibular third molars were the most commonly impacted teeth in the age group from 21-40 years of age. The Chi square test was found to be statistically significant ($p=0.001$)

DISCUSSION:

Impacted teeth are defined as teeth that remain completely or incompletely embedded within the jawbone or mucosa for 2 or more years following physiological eruption time.(1)

Although there is wide variation in impacted teeth among individuals, Studies have shown the mandibular last molar to be the most commonly impacted tooth followed by the maxillary third molars, the maxillary canines and the mandibular premolars.(2)

In the present study, the most (90%) commonly impacted teeth were mandibular third molars. These findings are in concurrence with the findings from other studies.(5,9,32) The reasons for this occurrence have various causes that have been suggested in the literature for the impaction of the third molar. It has been suggested that the gradual evolutionary reduction in the size of the human mandible/maxilla has resulted in too small mandible/maxilla that may accommodate the corresponding molars.(33,34) It has also been found that the modern diet does not offer a decided effort in mastication, resulting in loss of growth stimulation of jaws, and thus the modern man has impacted and unerupted teeth. There were few patients who were found to have multiple impactions. Often these were coincidental findings when patients presented with either complaints from only one of them or a completely different complaint unrelated to the impactions. Impacted canines and premolars were a rarity (<15%) most possibly because when impacted these teeth often interfere with aesthetics therefore were removed at younger ages. Furthermore, patients with teeth that did not erupt into the oral cavity generally did not present any complaints but rather the findings were incidental. Conversely, impacted molars that partially appeared in the oral cavity were found to be responsible for a number of problems including severe pain from pulpitis due to caries or pericoronitis.

In our study, Mandibular third molar impactions were common among all age groups, but the prevalence was higher among patients from 21-40 years of age. The results of our study were in concordance with a study done by *Brakus et al 2010.*, (4) The mean age of patients with impactions as was found in this study was slightly higher compared to reports from Europe and America. (7) This might be explained by the fact that in those countries impactions are discovered during routine dental examinations which start at younger ages.(35,36) On the other hand in resource poor countries and for Tanzania in particular, the majority of the patients report for health care only after experiencing symptoms that lead to a certain degree of incapacitation which varies from mild to severe pain, swellings, trismus or fever. (37)

In terms of timely diagnosis, it's often difficult to work out whether the missing teeth are actually impacted or delayed, especially in young patients. Hence, the detailed assessment of impacted teeth for its location, angulation, and orientation is vital for treatment planning.

CONCLUSION:

The most common impacted teeth were found to be mandibular third molars and the most common age group was found to be 21-40 years. In terms of timely diagnosis, it's often difficult to work out whether the missing teeth are actually impacted or delayed, especially in young patients. Hence, the detailed assessment of impacted teeth for its location, angulation, and orientation is vital for treatment planning.

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Conflict of Interest:

No conflict of interest

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REFERENCES:

- Msagati F, Simon ENM, Owibingire S. Pattern of occurrence and treatment of impacted teeth at the Muhimbili National Hospital, Dar es Salaam, Tanzania. *BMC Oral Health*. 2013 Aug 6;13:37.
- Chu FCS, Li TKL, Lui VKB, Newsome PRH, Chow RLK, Cheung LK. Prevalence of impacted teeth and associated pathologies--a radiographic study of the Hong Kong Chinese population. *Hong Kong Med J*. 2003 Jun;9(3):158-63.
- Tarzona BA, Paredes VB, Llamas JM, Cibrian RE, Gandia JL. Influence of first and second premolar extractions or non extraction treatments on mandibular third molar angulation and position. A comparative study. *Med Oral Patol Oral Cir Bucal*. 2010;15:760-6.
- Brakus I, Filipović Zore I, Borić R, Sibera S, Svegar D, Kuna T. Analysis of impacted and retained teeth operated at Department of Oral Surgery, School of Dental Medicine, Zagreb. *Coll Antropol*. 2010 Mar;34 Suppl 1:229-33.
- Padhye MN, Dabir AV, Girotra CS, Pandhi VH. Pattern of mandibular third molar impaction in the Indian population: a retrospective clinico-radiographic survey. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2013 Sep;116(3):e161-6.
- D'Alessandro G, Tagariello T, Piana G. Cleidocranial dysplasia: etiology and stomatognathic and craniofacial abnormalities. *Minerva Stomatol*. 2010 Mar;59(3):117-27.
- Mollaoglu N, Cetiner S, Güngör K. Patterns of third molar impaction in a group of volunteers in Turkey. *Clin Oral Investig*. 2002 Jun;6(2):109-13.
- Bataineh AB, Al QMA. The predisposing factors of pericoronitis of mandibular third molars in a Jordanian population. *Quintessence Int*. 2003 Mar;34(3):227-31.
- Wahid A, Mian FI, Bokhari SAH, Moazzam A, Kramat A, Khan F, et al. Prevalence of impacted mandibular and maxillary third molars: a radiographic study in patients reporting madina teaching hospital, Faisalabad. *Jumdc*. 2013;4(2):22-31.
- Hohoff A, Joos U, Meyer U, Ehmer U, Stamm T. The spectrum of Apert syndrome: phenotype, particularities in orthodontic treatment, and characteristics of orthognathic surgery. *Head Face Med*. 2007 Feb 8;3:10.
- Chokron A, Reveret S, Salmon B, Vermelin L. Strategies for treating an impacted maxillary central incisor. *Int Orthod*. 2010 Jun;8(2):152-76.
- J PC, Marimuthu T, C K, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study. *Clin Implant Dent Relat Res*. 2018 Aug;20(4):531-4.
- Wahab PUA, Madhulaxmi M, Senthilnathan P, Muthusekhar MR, Vohra Y, Abhinav RP. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study. *J Oral Maxillofac Surg*. 2018 Jun;76(6):1160-4.
- Mudigonda SK, Murugan S, Velavan K, Thulasiraman S, Krishna Kumar Raja VB. Non-suturing microvascular anastomosis in maxillofacial reconstruction- a comparative study. *Journal of Cranio-Maxillofacial Surgery*. 2020 Jun 1;48(6):599-606.
- Narayanasamy RK, Muthusekar RM, Nagalingam SP, Thyagarajan S, Ramakrishnan B, Perumal K. Lower pretreatment hemoglobin status and treatment breaks in locally advanced head and neck squamous cell carcinoma during concurrent chemoradiation. *Indian J Cancer*. 2021 Jan;58(1):62-8.
- Wang H, Chinnathambi A, Alahmadi TA, Alharbi SA, Veeraraghavan VP, Krishna Mohan S, et al. Phyllanthin inhibits MOLT-4 leukemic cancer cell growth and induces apoptosis through the inhibition of AKT and JNK signaling pathway. *J Biochem Mol Toxicol*. 2021 Jun;35(6):1-10.
- Li S, Zhang Y, Veeraraghavan VP, Mohan SK, Ma Y. Restorative Effect of Fucoxanthin in an Ovalbumin-Induced Allergic Rhinitis Animal Model through NF- κ B p65 and STAT3 Signaling. *J Environ Pathol Toxicol Oncol*. 2019;38(4):365-75.
- Ma Y, Karunakaran T, Veeraraghavan VP, Mohan SK, Li S. Sesame Inhibits Cell Proliferation and Induces Apoptosis through Inhibition of STAT-3 Translocation in Thyroid Cancer Cell Lines (FTC-133). *Biotechnol Bioprocess Eng*. 2019 Aug 1;24(4):646-52.
- Bishir M, Bhat A, Essa MM, Ekpo O, Ihunwo AO, Veeraraghavan VP, et al. Sleep deprivation and neurological disorders. *Biomed Res Int [Internet]*. 2020;2020. Available from: <https://www.hindawi.com/journals/bmri/2020/5764017/>
- Fan Y, Maghimaa M, Chinnathambi A, Alharbi SA, Veeraraghavan VP, Mohan SK, et al. Tomentosin Reduces Behavior Deficits and Neuroinflammatory Response in MPTP-Induced Parkinson's Disease in Mice. *J Environ Pathol Toxicol Oncol*. 2021;40(1):75-84.
- Zhang C, Chen Y, Zhang M, Xu C, Gong G, Veeraraghavan VP, et al. Vicenin-2 Treatment Attenuated the Diethylnitrosamine-Induced Liver Carcinoma and Oxidative Stress through Increased Apoptotic Protein Expression in Experimental Rats. *J Environ Pathol Toxicol Oncol [Internet]*. 2020;39(2). Available from: <https://www.dl.begellhouse.com/journals/0ff459a57a4c08d0,2306a38266045594,575eefed55c2478f.html>
- Gan H, Zhang Y, Zhou Q, Zheng L, Xie X, Veeraraghavan VP, et al. Zingerone induced caspase-dependent apoptosis in MCF-7 cells and prevents 7,12-dimethylbenz (a)anthracene-induced mammary carcinogenesis in experimental rats. *J Biochem Mol Toxicol [Internet]*. 2019 Oct;33(10). Available from: <https://onlinelibrary.wiley.com/doi/10.1002/jbt.22387>
- Saravanakumar K, Park S, Mariadoss AVA, Sathiyaseelan A, Veeraraghavan VP, Kim S, et al. Chemical composition, antioxidant, and anti-diabetic activities of ethyl acetate fraction of *Stachys riederi* var. *japonica* (Miq.) in streptozotocin-induced type 2 diabetic mice. *Food Chem Toxicol*. 2021 Sep 1;155:112374.
- Veeraraghavan VP, Hussain S, Papayya Balakrishna J, Dhawale L, Kullappan M, Mallavarapu Ambrose J, et al. A Comprehensive and Critical Review on Ethnopharmacological Importance of Desert Truffles: *Terfezia clavayi*, *Terfezia boudieri*, and *Tirmania nivea*. *Food Rev Int*. 2021 Feb 24;1-20.
- Wei W, Li R, Liu Q, Seshadri VD, Veeraraghavan VP, Mohan SK, et al. Amelioration of oxidative stress, inflammation and tumor promotion by Tin oxide-Sodium alginate-Polyethylene glycol-Allyl isothiocyanate nanocomposites on the 1, 2-Dimethylhydrazine induced colon carcinogenesis in rats. *Arabian Journal of Chemistry*. 2021;103238.
- Sathya S, Ragul V, Veeraraghavan VP, Singh L, Niyas Ahamed MI. An in vitro study on hexavalent chromium [Cr(VI)] remediation using iron oxide nanoparticles based beads. *Environmental Nanotechnology, Monitoring & Management*. 2020 Dec 1;14:100333.
- Chandrasekar R, Chandrasekar S, Sundari KKS. Development and validation of a formula for objective assessment of cervical vertebral bone age. *Progress in [Internet]*. 2020; Available from: <https://link.springer.com/article/10.1186/s40510-020-00338-0>
- Ramakrishnan M, Dhanalakshmi R, Subramanian EMG. Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry - A systematic review. *Saudi Dent J*. 2019 Apr 1;31(2):165-72.
- Felicita AS. Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor - The sling shot method. *Saudi Dent J*. 2018 Jul 1;30(3):265-9.
- Su P, Veeraraghavan VP, Krishna Mohan S, Lu W. A ginger derivative, zingerone-a phenolic compound-induces ROS-mediated apoptosis in colon cancer cells (HCT-116). *J Biochem Mol Toxicol*. 2019 Dec;33(12):e22403.
- Wan J, Feng Y, Du L, Veeraraghavan VP, Mohan SK, Guo S. Antiatherosclerotic Activity of Eriocitrin in High-Fat-Diet-Induced Atherosclerosis Model Rats. *J Environ Pathol Toxicol Oncol*. 2020;39(1):61-75.
- Obiechina AE, Artiba JT, Fasola AO. Third molar impaction: evaluation of the symptoms and pattern of impaction of mandibular third molar teeth in Nigerians. *Odontostomatol Trop*. 2001 Mar;24(93):22-5.
- Capelli J Jr. Mandibular growth and third molar impaction in extraction cases. *Angle Orthod*. 1991 Autumn;61(3):223-9.
- Behbehani F, Artun J, Thalib L. Prediction of mandibular third-molar impaction in adolescent orthodontic patients. *Am J Orthod Dentofacial Orthop*. 2006 Jul;130(1):47-55.
- Ventä I, Turtola L, Murtomaa H, Ylipaavalniemi P. Third molars as an acute problem in Finnish university students. *Oral Surg Oral Med Oral Pathol*. 1993 Aug;76(2):135-40.
- Fernandes MJ, Ogden GR, Pitts NB, Ogston SA, Ruta DA. Incidence of symptoms in previously symptom-free impacted lower third molars assessed in general dental practice. *Br Dent J*. 2009 Sep 12;207(5):E10; discussion 218-9.
- Angelillo IF, Nobile CG, Pavia M. Survey of reasons for extraction of permanent teeth in Italy. *Community Dent Oral Epidemiol*. 1996 Oct;24(5):336-40.