



## Prevalence of Complete Edentulism, Class 2 Malocclusion and Impacted Teeth in a Known Population and their Treatment with Complete Denture, Myofunctional Appliances and Disimpaction, Respectively.

Dr.Samidha Pande, Dr. Rutuja Muneshwar<sup>2</sup> Dr. Rahul Gupta<sup>3</sup>, Dr.Kishor B. Bagalkot<sup>4</sup>

Dr.Yashavanth A<sup>5</sup>, Dr.Kunal Rathore MDS<sup>6</sup>

<sup>1</sup>Bds Mds (prosthodontist), Asst professor, Ranjeet deshmukh dental college and research centre nagpur

<sup>2</sup>Senior Lecturer, Department of Oral Medicine and Radiology, Swargiya Dadasaheb Kalmegh Smruti Dental College and Hospital, Nagpur

<sup>3</sup>B.D.S. M.D.S, Prosthodontist,Assistant Professor (Dentistry Department), JNU Institute For Medical Sciences And Research Centre. Jaipur, Jagatpura.

<sup>4</sup>Professor, Department of Orthodontics, PMNM Dental College and Hospital ,Bagalkot. Karnataka.

<sup>5</sup>Reader, Dept of OMFS, Rajiv Gandhi college of Dental Sciences, Chola nagar, Bangalore 560032

<sup>6</sup>Reader, Dept. of Orthodontics & Dentofacial Orthopedics. Darshan Dental College & Hospital , Udaipur Rajasthan.

**Corresponding author:** Dr.Samidha Pande, Bds Mds (prosthodontist), Asst professor, Ranjeet deshmukh dental college and research centre nagpur

*(Received: 16 November 2024*

*Revised: 11 December 2024*

*Accepted: 11 January 2025)*

### KEYWORDS

Edentulism,  
Impaction,  
Malocclusion,  
Denture,  
Appliances,  
Disimpaction

### ABSTRACT:

**Background:** This study was conducted to assess the prevalence of complete edentulism, class 2 malocclusion and impacted teeth in a known population and their treatment with complete denture, myofunctional appliances and disimpaction, respectively.

**Material and methods:** This study was conducted to assess the prevalence of complete edentulism, class 2 malocclusion and impacted teeth in a known population and their treatment with complete denture, myofunctional appliances and disimpaction, respectively. The study comprised of 100 subjects who underwent oral clinical examination. The subjects had been explained about the procedure and were asked to give consent. The subjects who agreed to give consent had been included in the study. The prevalence of complete edentulism, class malocclusion and impacted teeth had been noted down and the management plan was constructed for the subjects. Statistical analysis was conducted using SPSS software.

**Results:** In this study, there were 63 males and 37 females. Complete edentulism was seen in 46 subjects, Class 2 malocclusion was evident in 25 subjects and impacted teeth were observed in 29 subjects. The prevalence of complete edentulism was 46%. The prevalence of class 2 malocclusion was 25% and the prevalence of impacted teeth was 29%. Complete dentures had been fabricated for the subjects with complete edentulism. Myofunctional appliances like twin block appliance, Jasper Jumper appliance, and Herbst appliance had been constructed for the subjects with class 2 malocclusion. Also, orthodontic appliances such as activator and Frankel II appliance were made for the subjects with class 2 malocclusion. For the management of impacted teeth, disimpaction was done.

**Conclusion:** The occurrence of complete edentulism was found to be 46%. Additionally, the rate of class 2 malocclusion was recorded at 25%, while the prevalence of impacted teeth stood at 29%. Subjects diagnosed with complete edentulism were provided with complete dentures. For those



exhibiting class 2 malocclusion, myofunctional devices, including the twin block appliance, Jasper Jumper appliance, and Herbst appliance, were developed. Furthermore, orthodontic devices such as the activator and Frankel II appliance were also fabricated for individuals with class 2 malocclusion. In cases of impacted teeth, disimpaction procedures were performed.

## Introduction

Malocclusion is increasingly understood as a normal biological variation, with the decision to pursue treatment often shaped by psychosocial considerations as much as by the recognized oral health risks linked to malocclusion. The criteria for determining which individuals would gain the most from orthodontic treatment remain contentious. This uncertainty poses challenges for general dentists in identifying patients who definitively need orthodontic care, especially since the typical pathway to such treatment begins within the general dental practice. Epidemiological studies have examined various populations to collect data on the prevalence of malocclusion.<sup>1-3</sup>

These investigations frequently utilize quantitative metrics in conjunction with Angle's classification system. Additionally, treatment-need indices have been employed to evaluate the necessity for orthodontic intervention, taking into account aesthetic factors, potential adverse effects on dental health, and deviations from standard occlusion. The Index of Orthodontic Treatment Need (IOTN), which comprises both the Dental Health Component (DHC) and the Aesthetic Component (AC), stands out as the most commonly used tool for assessing treatment necessity. Its objectivity and thoroughness, which allow for comparisons among different population groups, represent some of the index's most notable strengths.<sup>5-8</sup>

This study was conducted to assess the prevalence of complete edentulism, class 2 malocclusion and impacted teeth in a known population and their treatment with complete denture, myofunctional appliances and disimpaction, respectively.

## Material and methods

This study was conducted to assess the prevalence of complete edentulism, class 2 malocclusion and impacted teeth in a known population and their treatment with complete denture, myofunctional appliances and disimpaction, respectively. The study comprised of 100

subjects who underwent oral clinical examination. The subjects had been explained about the procedure and were asked to give consent. The subjects who agreed to give consent had been included in the study. The prevalence of complete edentulism, class malocclusion and impacted teeth had been noted down and the management plan was constructed for the subjects. Statistical analysis was conducted using SPSS software.

## Results

**Table 1: Gender-wise distribution of subjects.**

Gender	Number of subjects	Percentage
Male	63	63
Female	37	37
Total	100	100

In this study, there were 63 males and 37 females.

**Table 2: Prevalence of complete edentulism, class 2 malocclusion and impacted teeth**

Condition	Number of subjects	Percentage
Complete edentulism	46	46
Class 2 malocclusion	25	25
Impacted teeth	29	29

Complete edentulism was seen in 46 subjects, Class 2 malocclusion was evident in 25 subjects and impacted teeth were observed in 29 subjects. The prevalence of complete edentulism was 46%. The prevalence of class 2 malocclusion was 25% and the prevalence of impacted teeth was 29%.

**Table 3: Management plan of subjects**

Condition	Management
Complete Edentulism	Complete denture



Class 2 malocclusion	Twin block appliance, Jasper jumper appliance, Herbst appliance, Activator, Frankel II appliance.
Impacted teeth	Disimpaction

Complete dentures had been fabricated for the subjects with complete edentulism. Myofunctional appliances like twin block appliance, Jasper Jumper appliance, and Herbst appliance had been constructed for the subjects with class 2 malocclusion. Also, orthodontic appliances such as activator and Frankel II appliance were made for the subjects with class 2 malocclusion. For the management of impacted teeth, disimpaction was done.

### Discussion

A tooth which has been prevented to erupt into its anatomical position in dental arches and covered by mucosal tissue and bone or another tooth is considered to be an impacted tooth.<sup>9</sup>

Impacted tooth can be completely unerupted or can be partially erupted. The etiology for impacted tooth can be due to lack of space in maxillary or mandibular arch, abnormal tooth bud positioned, overlying dense bone, obstruction from adjacent tooth, pathologies, or syndromes, etc.<sup>10,11</sup>

The highest prevalence of impacted tooth in the permanent dentition is the mandibular third molars followed by maxillary third molars with a reported frequency which varies from 16.7% to 73.82%.<sup>12</sup> Maxillary canines also have reported with a high prevalence rate of followed by second premolars.<sup>12</sup> Mean eruption age of third molars varies in the range of 17-21 years.

This study was conducted to assess the prevalence of complete edentulism, class 2 malocclusion and impacted teeth in a known population and their treatment with complete denture, myofunctional appliances and disimpaction, respectively.

Salam S et al<sup>13</sup> assessed the prevalence of impaction and pattern of mandibular impaction among adults in Ernakulam district, Kerala. Retrospective data were analyzed using panoramic radiographs of 1,500 subjects were correlated with demographic details age and gender.

Two independent investigators carried out the research independently. Data were analyzed using SPSS. The prevalence of teeth impaction was 22.0%. A total of 330 subjects presented with at least one impacted tooth. Mandibular third molars were the most commonly impacted tooth (17.46%). The mesioangular orientation was the most common pattern. There was no gender difference in prevalence of impaction ( $P > .05$ ). Twenty two percent among Kerala population. The mandibular wisdom teeth were the most commonly impacted teeth. Mesioangular orientation was the most common pattern. No association was found between impacted teeth as per gender.

In the study by Vemulapalli A et al<sup>14</sup>, data were obtained from the Behavioral Risk Factor Surveillance System from 2012 through 2020. US- and state-level trend lines were reported. Multiple logistic regression analyses were used to evaluate the association between self-reported complete edentulism and demographic characteristics, chronic diseases, smoking status, and health insurance status. Multiple imputations were used to address the missing data. A total of 771,513 (weighted  $n = 50,410,576$ ) participants were included in the study. There was a significant ( $P = .021$ ) downward trend in the prevalence of edentulism from 2012 (16.36%) through 2020 (13.54%). Having less than a high school education, being a smoker, being non-Hispanic Black, having an annual household income less than \$75,000, and having chronic conditions, including diabetes, myocardial infarction, arthritis, depression, and stroke, were significantly associated with complete edentulism. Despite a decrease in prevalence of edentulism, disparities based on race, income, and education still exist. Edentulism is associated with chronic diseases in older adults.

Kaur H et al<sup>15</sup> recorded prevalence of malocclusion among 2,400 adolescents in Karnataka state, India and to define difference in malocclusion status in urban and rural population. Each individual was assessed for occlusal traits - sagittal occlusion, overjet, overbite, crowding, midline diastema, and crossbite. Examinations were computerized and analyzed using Statistical Package for Social Sciences version 16. Chi-square test was used for computing statistical significance. 87.79% of population had malocclusion. Out of which 89.45% had class I, 8.37% had class II, and 2.14% had class III malocclusion. Normal overjet and overbite was seen in



48.22 and 49.87% of subjects, respectively. Frequency of crowding was 58.12% and 15.43% of subjects had midline diastema. Anterior crossbite was present in 8.48% and posterior crossbite in 0.99%. Urban population had twice the class II sagittal occlusion, and increased overjet as compared to rural population. Malocclusion is widely spread among population of Karnataka state, with greater prevalence in urban population. Early exfoliation of deciduous teeth and refined diet can be considered as viable etiological factors.

### Conclusion

The occurrence of complete edentulism was found to be 46%. Additionally, the rate of class 2 malocclusion was recorded at 25%, while the prevalence of impacted teeth stood at 29%. Subjects diagnosed with complete edentulism were provided with complete dentures. For those exhibiting class 2 malocclusion, myofunctional devices, including the twin block appliance, Jasper Jumper appliance, and Herbst appliance, were developed. Furthermore, orthodontic devices such as the activator and Frankel II appliance were also fabricated for individuals with class 2 malocclusion. In cases of impacted teeth, disimpaction procedures were performed.

### References

- Bentele MJ, Vig KW, Shanker S, Beck FM. Efficacy of training dental students in the index of orthodontic treatment need. *Am J Orthod Dentofacial Orthop.* 2002;122(5):456–462.
- Brunelle JA, Bhat M, Lipton JA. Prevalence and distribution of selected occlusal characteristics in the US population, 1988-1991. *J Dent Res.* 1996;75 Spec No:706–713.
- Tschill P, Bacon W, Sonko A. Malocclusion in the deciduous dentition of Caucasian children. *Eur J Orthod.* 1997;19(4):361–367.
- Thilander B, Pena L, Infante C, Parada SS, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. *Eur J Orthod.* 2001;23(2):153–167.
- Tausche E, Luck O, Harzer W. Prevalence of malocclusions in the early mixed dentition and orthodontic treatment need. *Eur J Orthod.* 2004;26(3):237–244.
- Ciuffolo F, Manzoli L, D'Attilio M, Tecco S, Muratore F, Festa F. Prevalence and distribution by gender of occlusal characteristics in a sample of Italian secondary school students: a cross-sectional study. *Eur J Orthod.* 2005;27(6):601–606.
- Perillo L, Masucci C, Ferro F, Apicella D, Baccetti T. Prevalence of orthodontic treatment need in southern Italian schoolchildren. *Eur J Orthod.* 2010;32(1):49–53.
- Gelgör IE, Sisman Y, Malkoç S. Prevalence of congenital hypodontia in the permanent dentition. *Türkiye Klinikleri J Dental Sci.* 2005;11(2):43–48. [Google Scholar]
- Evans R, Shaw W. Preliminary evaluation of an illustrated scale for rating dental attractiveness. *Eur J Orthod.* 1987;9(4):314–318.
- American Association of Oral and Maxillofacial Surgery. Impacted teeth. *Oral Health.* 1998;88:31–2.
- Passi D, Singh G, Dutta S, Srivastava D, Chandra L, Mishra S, et al. Study of pattern and prevalence of mandibular impacted third molar among Delhi-National Capital Region population with newer proposed classification of mandibular impacted third molar: A retrospective study. *Natl J Maxillofac Surg.* 2019;10:59–67.
- Hou R, Kong L, Ao J, Liu G, Zhou H, Qin R, et al. Investigation of impacted permanent teeth except the third molar in Chinese patients through an X-ray study. *J Oral Maxillofac Surg.* 2010;68:762–7.
- Santosh P. Impacted mandibular third molars: Review of literature and a proposal of a combined clinical and radiological classification. *Ann Med Health Sci Res.* 2015;5:229–34.
- Salam S, Bary A, Sayed A. Prevalence of Impacted Teeth and Pattern of Third Molar Impaction among Kerala Population a Cross Sectional Study. *J Pharm Bioallied Sci.* 2023 Jul;15(Suppl 1):S354-S357.
- Vemulapalli A, Mandapati SR, Kotha A, Rudraraju H, Aryal S. Prevalence of complete edentulism among US adults 65 years and older: A Behavioral Risk Factor Surveillance System study from 2012 through 2020. *J Am Dent Assoc.* 2024 May;155(5):399-408.
- Kaur H, Pavithra US, Abraham R. Prevalence of malocclusion among adolescents in South Indian population. *J Int Soc Prev Community Dent.* 2013 Jul;3(2):97-102.