

Assessment of Partially Edentulous Patients Based on Kennedy's Classification and its Relation with Gender Predilection

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Abstract

Background: A partially edentulous arches classification helps to identify possible combinations of teeth to edentulous ridges, thus facilitating discussion, communication and comprehension of the indicated prosthetic treatment among dental professionals, students and technicians. Kennedy's classification provides immediate visualization, recognition of prosthesis support and assessment of design features of removable partial denture.

Aims and Objective: The aim of this study was to assess the prevalence of the partially edentulous condition, along with the current treatment modalities in the South Indian population and to plan for further scope of improvement. To find the pattern of tooth loss and its relationship with gender and arches.

Materials and Methods: This is a cross-sectional study to be conducted among the patients of Thiruvallur district.

Study Population: Partially edentulous patients of age group of more than 20 years. Questionnaire is containing self-constructed 20 close-ended questions to be used for the partially edentulous patients. Data to be collected by investigator with structured questionnaire by face to face interview and thorough clinical examination. Pilot study was conducted on 30 patients. Questionnaire containing self-constructed 20 close-ended questions was used for testing feasibility, clarity, and validity of the questions.

Results: Kennedy's Class III was found to be the most common pattern of partial edentulism in both maxilla 40% and mandible 43% in this study. Kennedy's Class IV was the least common pattern of edentulism. Mandibular edentulism is more common than the maxilla. Women shows a higher proportion of edentulousness than male.

Conclusion: Kennedy's Class III partially edentulousness is found most commonly in this study.

Keywords: Kennedy's classification, Oral hygiene, Partially edentulousness, Tooth loss

INTRODUCTION

Teeth are the main functional component of the oral cavity. Teeth provide variety of function includes mastication, speech and esthetics. Absence of teeth in the oral cavity resulting in difficulty in chewing food, alteration of speech and poor esthetics, greatly affect the quality-of-life.^{1,2} According to World Health Organization, adult should have a minimum of 21 functional teeth to provide good dietary intake.³ Oral health plays a vital role towards the quality of life. Good oral health and prevention of tooth loss improves the diet and nutritional status.⁴

Tooth loss occurs in the oral cavity by various cause like dental caries, periodontal diseases, trauma, pulpal and peri-radicular diseases and various systemic diseases.⁵ Tooth loss creates space in the oral cavity that are called edentulous space. Edentulism whether partial or complete indicates the awareness and oral health of a particular population.⁶ Edentulism also reflects the preventive dental treatment provided in populations. The partial prosthodontic replacement of missing teeth requires the restore the function.⁷

The variation in number and location of the edentulous space and its relation to the remaining natural teeth necessitates to classify the partial edentulous arches.⁸ The

purpose of classification of partial edentulous arches provides, communication between dental colleagues, students, technician about the case, for planning good treatment, to design the partial denture. It also predicts the difficulties commonly occur with particular removable partial denture design.⁹

There are numbers of classification for classifying the partially edentulous arches. The common one are Cummer, Kennedy, Applegates, Neurohr, Bailyn, Wild, Skinner, Avant. All classification has advantages and disadvantages.^{10,11} Among all classifications Kennedy's classification is most commonly used and widely accepted because it provides immediate visualization, it allows the differentiation between tooth born and tooth tissue born partial denture.^{8,12}

MATERIALS AND METHODS

This study was carried out at Department of Prosthodontics, of Priyadarshini Dental College and Hospital. Study was conducted randomly among 100 patients visited dental outpatient department. Patients were interviewed, and information was filled in structured pro forma.

Evaluation of partially edentulousness according to Kennedy's classification and Applegate's modification was carried out. Thorough oral examination of both the dental arches of each patient was done after informed consent. Patterns of partial edentulism were recorded, and data collected was registered on to a pro forma. The same investigator was involved in interviewing and filling the pro forma who perform the oral examination.

Kennedy's classification:

1. Class-I: Bilateral edentulous area present posterior to remaining natural teeth
2. Class-II: Unilateral edentulous area present posterior to remaining natural teeth
3. Class-III: Unilateral edentulous area with natural teeth both anterior and posterior to it
4. Class-IV: Single but bilateral edentulous area present anterior to remaining natural teeth.

Sampling method: Simple random sampling.

Study design: Cross sectional study.

Inclusion criteria

Study population who satisfied following criteria were included in the study:

1. Patients above age of 20 years irrespective of sex, race, socioeconomic status having partially edentulism in either or both the arches
2. Individuals who were willing and cooperative for study.

Exclusion criteria

Patients are having complete edentulism and missing third molars. The single-examiner concept was followed to maintain the consistency and to prevent inter-examiner bias. The data that were collected was tabulated using a computerized spreadsheet (Microsoft Excel 2010; Microsoft, Redmond, Washington, SPSS version 16.0 Chicago, IL) and it was analyzed using descriptive statistics.

RESULTS

A total of 100 study population aged above 20 years, males and females were examined for the incidence of partial edentulousness among the maxillary and mandibular arches and for the type of Kennedy's classification which was present in the arches.

Out of 100 subjects, Patients having partially edentulousness in the maxillary arches found to be 73 and partially edentulousness in the mandibular arch found to be 77, thus indicating a higher incidence in the mandibular arch than in the maxillary arch.

Gender wise distribution in relation to Kennedy's classification in the upper arch shows 34 male and 39 females of which Class III was found to be most common (Table 1 and Figure 1).

Similarly, Kennedy's class in the lower arch revealed 36 males and 41 females (Table 2 and Figure 2). In the lower arch also Class III was most common.

An incidence of 56.7% was reported for Kennedy's Class III classification, followed by the Class II (18%), Class I (16.7%) and the Class IV (8.6%) classifications.

Distribution of various Kennedy's class in maxillary partial edentulous arch (Table 3 and Figure 3) and

Table 1: Gender distribution in various Kennedy's classes in maxilla

Gender	Class-I	Class-II	Class-III	Class-IV	Total
Male	3	11	16	4	34
Female	4	7	25	3	39
Total (%)	7 (9.5)	18 (24.6)	41 (56)	7 (9.5)	73

Table 2: Gender distribution in various Kennedy's classes in mandible

Gender	Class-I	Class-II	Class-III	Class-IV	Total
Male	10	5	9	2	26
Female	8	4	25	4	41
Total (%)	18 (23.3)	9 (11.7)	44 (58)	6 (8)	77

mandibular partial edentulous arch (Table 4 and Figure 4) is summarized.

DISCUSSION

Various systemic and local factors are associated with loss of tooth. Such factors are smoking, diabetes, dental caries, impacted teeth, pulpal and periodontal diseases. Among

these factors, dental caries and the periodontal diseases are most commonly associated with tooth loss proved by many studies.^{5,13}

In this study, Kennedy's classification were used as it's provide immediate visualization of the edentulous space, and easy description of the potential combination between ridge and teeth.¹¹

Table 3: Distribution of various Kennedy's classes in maxillary arch

Type of partial edentulism in maxilla	Frequency	Percentage
Class I	3	4.10
Class II	0	0
Class III	18	24.65
Class IV	7	9.5
Class I modification 1	3	4.10
Class I modification 2	1	1.36
Class II modification 1	10	13.69
Class II modification 2	3	4.10
Class III modification 1	18	24.65
Class III modification 2	4	5.47
Class III modification 3	1	1.36

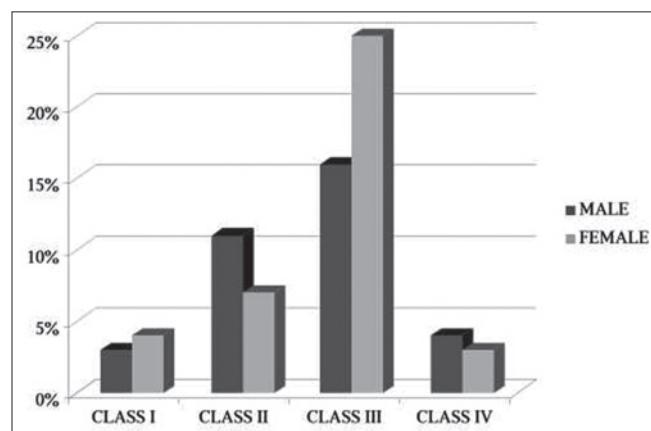


Figure 1: Gender distribution in various Kennedy's classes in maxilla

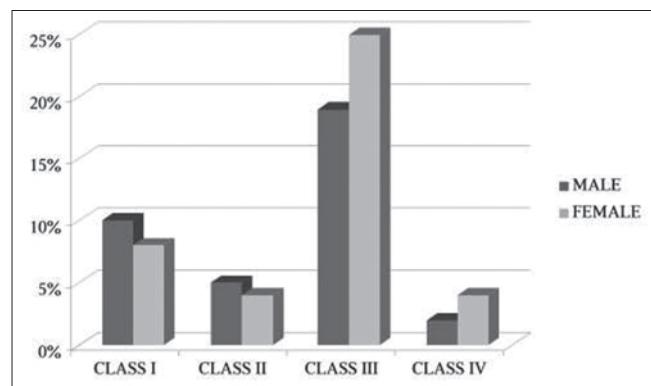


Figure 2: Gender distribution in various Kennedy's classes in mandible

Table 4: Distribution of various Kennedy's classes in mandibular arch

Type of partial edentulism in mandible	Frequency	Percentage
Class I	15	19.4
Class II	3	3.9
Class III	17	22.07
Class IV	6	8
Class I modification 1	2	2.6
Class I modification 2	1	1.3
Class II modification 1	5	6.5
Class II modification 2	1	1.3
Class III modification 1	19	24.7
Class III modification 2	6	7.8
Class III modification 3	2	2.6

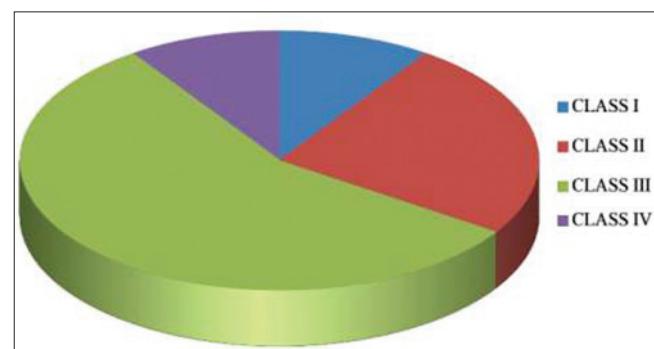


Figure 3: Pie chart of various types of partially edentulism in maxilla

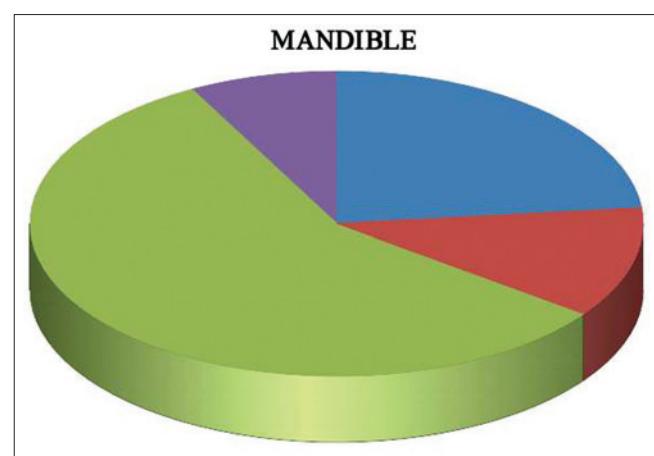


Figure 4: Pie chart of various types of partially edentulism in mandible

The results of our study indicate that the mandibular arch shows more edentulism than maxillary arch among our study population. This is in harmony with the study carried out by Curtis *et al.* at the University of California, School of Dentistry.¹⁴

Another study was carried out by Naveed *et al.*² the result of this study is also similar to our study, frequency of partial edentulism was higher in the mandibular arch being 67.4%, when compared to 63.2% in the maxillary arch.

In our study, the women shows higher proportion of edentulousness then male this result is concordance with study carried out by Sapkota⁴ upper arch shows 70 males and 56 females of which Class III was found to be the most common, in lower arch revealed 67 males and 70 females, however many previous studies shows higher proportion of edentulousness in male then female.¹⁵ These may be due to various socioeconomic factors, psychological factors, use of more sugars, smoking.

Kennedy's Class III was found to be the most common pattern of partial edentulism in this study. Kennedy Class III pattern of edentulism was most commonly encountered in both maxilla (56%) and mandible (58%). This result is in agreement with the study of Shah *et al.*¹⁶ Kennedy's Class III in maxilla along with Kennedy's Class III in mandible was the most common combination with 51%. This result shows similarity with Al-Dwairi's study. In Al-Dwairi's study 200 patients of Jordan were examined, out of 200 patients in 150 patients had partially edentulous maxilla and mandible of which Class III Kennedy's classification was most commonly present in both mandible (45%) and maxilla (47%). Kennedy Class III in maxilla with Class III mandible was the most common combination with frequency 30%. The study results are in agreement with Al-Dwairi's study.¹⁷

Similar studies should be conducted at various centers of India, the information should be gathered, a national database of partial edentulous and the patterns of tooth loss are maintained, the oral health awareness program should be organized in the population where there is a greater amount of tooth loss and edentulousness. By doing so we reduce the incidence of partial edentulous and tooth loss all around the India.

CONCLUSION

This study conducted in limited patients of Thiruvallur district at Priyadarshini Dental College and Hospital indicates the oral health status of patients. The study concluded that among the Kennedy's classification, Class III is the most common.

Mandibular partial edentulism found to be more common than maxillary partial edentulism. Higher frequency of partial edentulism is suggestive of a greater need to create awareness among the population regarding the prevention of dental caries and maintenance of oral hygiene. It is essential that tooth loss should be avoided as far as possible as it ultimately affects our overall health. If teeth have to be extracted or teeth have to be replaced prosthodontic rehabilitation should be provided to restore the efficient function and form of teeth and to stabilize the arch.

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