Incidence of partial edentulism and its relation with age and gender

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Abstract

Background and objective: This study aimed to determine the incidence of various partial edentoulism according to Kennedy's classification of edentulous arches, modification areas, types of removable partial dentures (RPDs), selection of major connectors for RPDs and patterns of tooth loss in relation to the gender and age.

Methods: The study was conducted in Hawler Medical University, College of Dentistry, Dep. of Prosthodontics, Erbil/Iraq. The data were collected from 963 patients aged 17-80 years of both genders. The survey was based on visual examination for determining the incidence of Kennedy's classification, modification areas in relation to the age and gender, determining the cause of tooth loss and types of major connectors for RPDs.

Results: Kennedy's class III in both dental arches was the most dominant pattern at a frequency of 49.84%, with class IV being the least in number. Mandibular RPDs were more common than maxillary RPDs. With an increase in age, there was an increase in the Class I and Class II dental arch and a decrease in Class III and class IV in both arches. Gender had no significant relationship with distributions of RPD classification.

The majority of the constructed RPDs were acrylic resin 881(91.49%) and only 82 (8.51%) were metal.

Conclusion: Kennedy's class III is the most common RPD in both dental arches. Gender had no effect on the prevalence of various Kennedy classes, while age has a significant effect.

Keywords: Edentulism, age, gender

Introduction

An edentulous space is a gap in the dental arch normally occupied by one tooth or more. It could be partial or complete. Among the causes of tooth loss are caries, periodontal diseases, trauma, orthodontic treatment, tooth impaction, hypoplasia, supernumerary teeth, neoplastic and cystic lesions[1].The primary purpose for the classification of partially edentulous arches is to identify potential combinations of teeth to edentulous ridges in order to facilitate communication among dental colleagues, students, and technicians[2]. Edentoulism (partial or complete) is an indicator of the oral health of a population[3]. Several methods have been proposed to classify the partially edentulous arches on the basis of the potential combinations of teeth to 4 ridges. At present, Kennedy's classification is probably the most widely accepted one. Kennedy divided all partially edentulous arches into four main types. In his classification, edentulous areas, other than those determining the main types, were designated as modification spaces. The Kennedy's classification is as follow. Class I. Bilateral edentulous areas located posterior to the remaining natural teeth. Class II. A unilateral edentulous area located posterior to the remaining natural teeth. Class III. A unilateral edentulous area with natural teeth remaining both anterior and posterior to it. Class IV. A single, but bilateral (crossing the midline) edentulous area located anterior to the remaining natural

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teeth. A positive relationship between tooth loss and age has been documented[5]. The correlation between the pattern of tooth loss and socio-economic status has also been established[6]. Literature review revealed that tooth loss differs by arch[2, 5]. with tooth loss being more common in maxilla than in the mandible, and posterior tooth loss usually preceding anterior tooth loss[7]. The pattern of tooth loss has been evaluated in many selected populations in different countries[2,4,6,8,9]. Hoover and McDermount reported a higher prevalence of edentulous arches in males than females[10]. The literature shows that most studies have been about RPDs[11]. Campbell[12] provided a reasonable basis for comparison by allowing intraoral evaluation of multiple RPD designs in test patients LaVere and Krol[13] studied the selection of a major connector for the extension-base RPD. Wagner and Traweek [14] influence compared major connectors for RPDs. Fisher[15] studied the facz\z\tors that the base stability of mandibular distal-extension RPDs. The aim of this study was to find the incidence of partial edentulsim pattern and its relation with age and group to determine the types of RPDs of treated patients.

Methods

The survey was conducted in Prosthodontics Department at the College of Dentistry/ Hawler Medical University/Erbil/Iraq, over a period of two consecutive academic years (November 2010–March 2012) The data were collected from 963 patients (501 males and 462 females) aged 17-80 years of both genders who were attend the Prosthodontics department for construction of RPDs. The survey was based on visual examination by seating the patient on the dental chair and using the mouth mirror for determining the incidences of Kennedy's classification, modification areas, , the types and area(location) of missing teeth and determining the cause of tooth loss, types of RPDs constructed (acrylic resin or metal), and relation to the age and gender. Clinical evaluation of the distance between the marginal gingival and the floor of the mouth was performed using a periodontal probe to determine the types of major connectors.

Statistical Analysis: A computer software SPSS version 17.0 was used after a cross tabulation to calculate the overall prevalence of Kennedy's classes. Chi-square test was used to determine the significance of differences between two different rates and the result was considered statistically significant when probability was less than 0.05.

Results

Out of 963 cases included in the study there were no statistically significant difference between males 501(52.02%) and females 462(47.98%) at (p>0.05). Table .1, 2 and 3 shows distribution of gender in different age groups and various Kennedy's classes for maxillary and mandibular arches respectively Table.4 shows the distribution of the various Kennedy's classes, class III was the most dominant pattern in both dental arches 480(49.84%)followed by class I 248(25.75%), class II 220 (22.84%) while class IV was the least among the other classes 15 (1.55).Although, most of the edentulous areas were in the mandible 485 (50.36) but there was no statistically significant difference of the prevalence between the upper and lower arches at (p>0.05).

Table 1: Gender distribution in different age groups

	17-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	
Male	3	25	62	144	118	99	50	501(52.02%)
Female	2	22	77	151	129	60	21	462(47.98%)
Total	5	47	139	295	247	159	71	963
Percentage	0.51	4.88	14.43	30.63	25.64	16.51	7.37	

Table 2: Gender distribution in different Kennedys classes in maxilla

Gender	Class I	Class II	Class III	Class IV
Male	58	69	144	8
Female	46	42	109	2
Total	104	111	253	10
Percentage	21.75	23.22	52.92	2.09

Table 3: Gender distribution in different Kennedys classes in mandible

Gender	Class I	Class II	Class III	Class IV
Male	68	49	101	4
Female	76	60	126	1
Total	144	109	227	5
Percentage	29.69	22.47	46.80	1.03

Table 4: Prevalence of Kennedy's classes

Arch	Class I	Class II	Class III	Class IV	Total	
Maxilla	104	111	253	10	478	49.63%
Mandible	144	109	227	5	485	50.36%
Total	248	220	480	15	963	
Percentage	25.75	22.84	49.84	1.55		100%

Table 5: Prevalence of Kennedy's class I with modification areas

Arch	Class I Mod 0	Class I Mod 1	Class I Mod 2	Class I Mod +3	Total
Maxilla	45	35	20	4	104
Mandible	78	49	16	1	144
Total	123	84	36	5	248
Percentage	49.59	33.87	14.51	2.01	100

Table 6: Prevalence of Kennedy's class II with modification areas

Arch	Class II Mod 0	Class II Mod 1	Class II Mod 2	Class II Mod +3	Total
Maxilla	17	41	35	18	111
Mandible	15	56	31	7	109
Total	32	97	66	25	220
Percentage	14.54	44.09	30	11.36	100

Table 7: Prevalence of Kennedy's class III with modification areas

Arch	Class III Mod 0	Class III Mod 1	Class III Mod 2	Class III Mod +3	Total
Maxilla	52	110	67	24	253
Mandible	41	119	56	11	227
Total	93	229	123	35	480
Percentage	19.37	47.70	25.62	7.29	100

Table 8: Types of constructed RPDs

Type of RPD	Frequency	Percentage
Acrylic	881	91.49
Chromium -cobalt	82	8.51

Most of the Class I partially edentulous arch 123 (49.59%) were present without modification spaces while only 32 (14.54%) of Class II RPD's lacked the modification area. Most of Class III arches (80%) had one or more modification areas as shown in Tables.5, 6 and 7. There was a highly significant difference between the type of constructed RPDs, Only 82 (8.51%) were made form Chromium –cobalt (metal) whilemajor connectors used, in maxilla the anterior palatal strap were used as twice as the other types and anterior posterior palatal bar being the least, while for the mandibular RPDs lingual bar remains the major connector of choice being used in 36 cases from total 47 mandibular RPDs the rest 881(91.49) were acrylic resin .Table.8 Table.9 and 10 represents the types of maxillary and mandibular Regarding the cause of tooth loss as shown in figure.1there was a great relation between the age and the cause of tooth loss, the primary cause was dental caries in younger patient (17-50 years). There was a sudden increase toward periodontal cause

Table 9: Types of major connectors used in maxilla

Major connector	Class I	Class II	Class III	Class IV	Total
Anterior palatal strap	6	3	6	4	19
Anterioposterior palatal strap	1	3	4		8
Palatal plate	4				4
U-shaped	2		2		4
Total	13	6	12	4	35

Table 10: Types of major connectors used in mandible

Major connector	Class I	Class II	Class III	Class IV	Total
Lingual plate	5	3	1	2	11
Lingual bar	15	13	8	0	36
Total	20	16	9	2	47

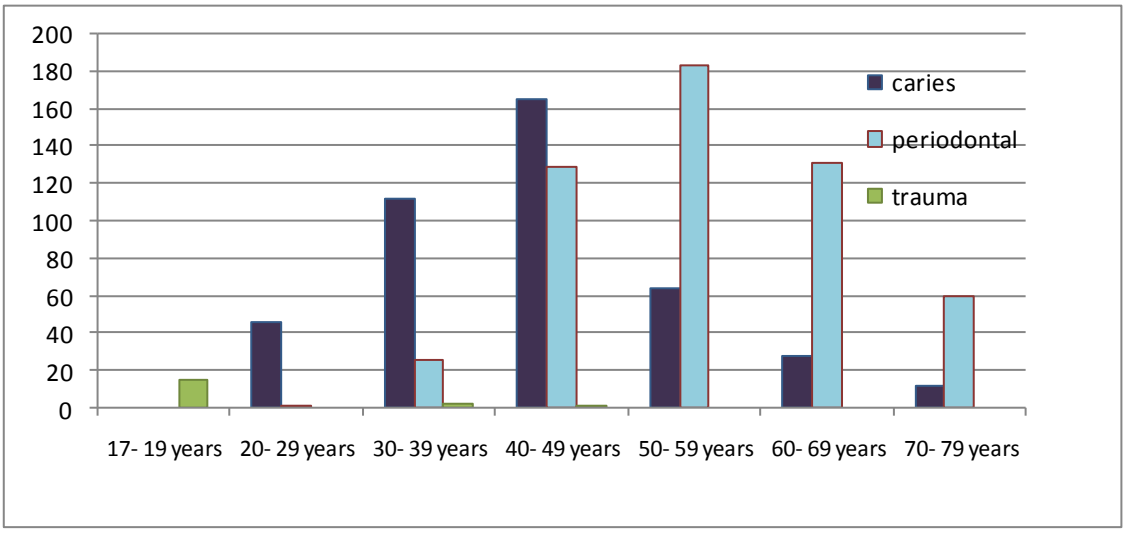

Figure 1: Cause of missing teeth in different age groups

from 60 years and above, traumatic tooth loss was found only in 18 cases. Most of the missing teeth were in the posterior area 540(56%) in both arches followed by combined anterior and posterior missing, isolated anterior missing teeth were found in minority of cases 67 (7%). Figure.2 and 3 shows the distribution of Kennedy's classes according to the pattern of modification areas. The majority of Kennedy's Class I in both arches was without modification areas (43% in the maxilla and 54.16% in the mandible). In Class III the posterior modification area was the most frequently presented in both arches (43.47% in the maxilla and 52.42% in the mandible).

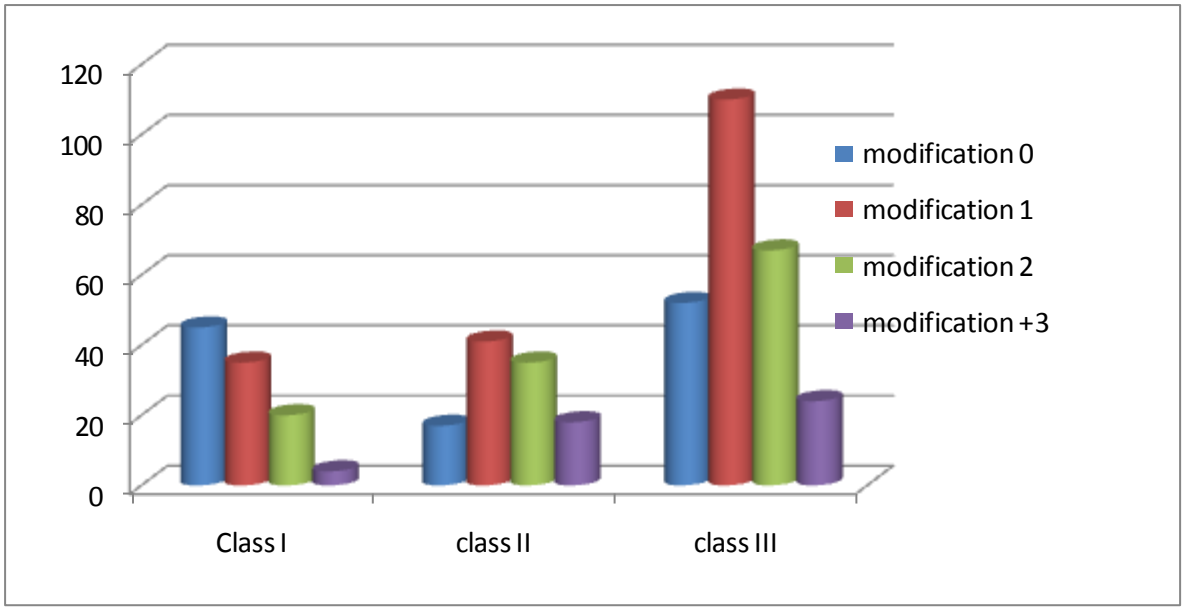

Figure 2: Distribution of Kennedy's classes according to the pattern of modification areas in maxilla

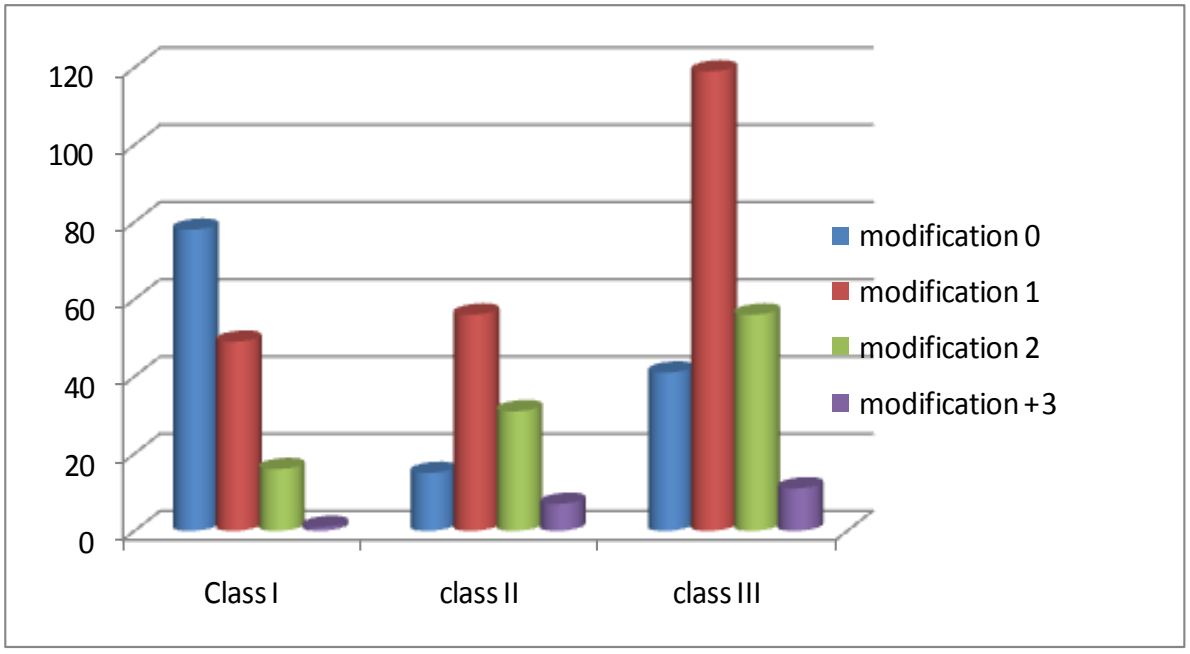

Figure 3: distribution of Kennedy's classes according to the pattern of modification areas in mandible

Discussion

To our knowledge this is the first study to report the prevalence of Kennedy's classes in partially edentulous patients in the Department of Prosthetic Dentistry, College of Dentistry, Hawler Medical University. Many studies have consistently shown the role of specific diseases like dental caries and periodontal disease as a major cause of tooth loss [8]. these two diseases were noted as major causes of tooth loss in early childhood and adolescence in the present study and this result agrees with previous studies [8, 16, 17]. Kennedy's class III was the dominant pattern in both dental arches followed by class I, class II and class IV being the least among the other classes and this finding was consistent with other studies [2, 9, 16, 18] but disagree with studies of other authors [4,19,20,21] this differences may be due to dietary habit, poor oral hygiene measures or higher sugar consumption in these societies. In this study Kennedy's class III was common in younger age group but there was significant decrease in class III and significant increase in class I, II with increase in age as more teeth are extracted due to multiple causes and, this finding agrees with the result of other studies [16-18, 22]. The results showed that gender had no statistically significant effect on prevalence of various RPDs classes in which the number of partially edentulous males was 501 (52.02%), and females 462 (47.98%), this finding is in line with the results of [9,19,23]. There was a highly significant differences in the types of constructed RPDs in which of 963 constructed RPDs the majority 881 (91.49%) was acrylic resin type and only 82 (8.51%) were metal and this could be due to the cost of this type or due to absence of knowledge about the metal RPDs, this finding disagreed with Pun D.K 24 who found that 73.3% of constructed RPDs were metal and only 22.4% were acrylic resin. For the constructed maxillary metal RPDs most commonly used major connector was anterior palatal strap followed byanterio-posterior palatal strap, this result agreed with 20but in contrast to Niarchou et al [19] and Pun D.K [24] who were found that U-shaped major connector was the most dominant, while for lower metal RPDs, in the present study lingual bar was major connector of choice in the mandible 36 (76.59%), this result is in line with other performed studies [9,19.24]. Regarding distribution of Kennedy's classes according to modification areas. The majority of Kennedy's Class I in both the arches was without modification areas; this finding is comparable with the results of earlier reported studies [2,9,19]. In Class III the posterior modification area was the most frequently presented in both arches this may be due to the fact that the posterior teeth erupted prior to the anterior teeth and/or they have greater surface area for caries attack because at this early age the children cannot perform adequate oral hygiene maintenance, this result is in line with Niarchou et al [19].

Conclusion

Kennedy's class III is the most common RPD in both dental arches. Gender had no gender effect on the prevalence of various Kennedy's classes, while age has a significant effect.

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