ORIGINAL ARTICLE

CLINICAL AND STATISTICAL STUDY OF TREATMENT PROCEEDINGS OF PARTIAL EDENTULISM

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Abstract: *Aim of the study.* This study aimed to highlight the treatment possibilities of partial edentulism in a group of patients based on Kennedy classification and to establish correlations between the prevalence of partial edentulism and gender, age, residence medium. We followed the presence or absence of previous prosthetic treatments, but also their type, fixed or removable. Material and method. The study involved 98 patients, of both genders, from both rural and urban areas, aged between 21 and 70 years. Results. The majority of patients were females, the age group 41-50 years being the most consistently represented. Most patients presented edentation in both arches and had previous prosthetic treatments. Conclusions. The highest prevalence of the edentulism class, both in the maxillary and mandibular arches, is represented by Kennedy class III. More than half of the patients in our study had benefited from previous prosthetic treatments - two thirds of these were treated fixed, and one third were treated removable.

Keywords: partial edentulism, Kennedy classification, prosthetic treatment

1. Introduction

Partial edentulism is a pathological condition of the dento-maxillary apparatus (DMA) caused by the loss of dental units, starting with a single one up to the loss of several or all dento-periodontal units [1]. The continuity of the dental arches is thus interrupted, shortened or interrupted and shortened, and the space resulting from the absence of dental units is called an edentulous space. From a clinical point of view, partial edentulism can be reduced, extended or extensive edentation. The morphology and topography of edentulous spaces vary depending on the number and topography of the absent teeth and their complications [2].

Depending on the number of absent teeth, their topography and the associations between these and the remaining teeth, there are a multitude of clinical situations. In order to systematize these clinical forms, multiple classifications of partial edentulism have been proposed. Among these, Kennedy classification was distinguished, dividing the forms of partial edentulism into four classes, depending on the topography of the edentulous spaces. Thus, Kennedy categorizes biterminal edentulism as class I edentulism, uniterminal edentulism as class II edentulism, intercalated edentulism as class III edentulism, and frontal edentulism on both sides of the midline as class IV edentulism. This classification is common in most specialty publications, being the most frequently used.

The partial edentulism disrupts the balance of forces of the dental arches, generating dental migration, unevenness of the occlusion plane and even occlusal dysfunction, sometimes involving the temporomandibular joint [3-6]. There are also affected the physiognomy, phonation, mastication, general condition, quality of life and even the economic performance of patients with partial edentulism [7,8].

The etiology of partial edentulism is multifactorial, being involved local and general factors. Among the local factors, we mention dental caries, periodontal disease, dental and maxillary bone trauma, suppurations and tumors [9-11].

The general factors are related to the socio-economic status and general condition of the patients. Thus, from a socio-economic point of view, aging, female gender, low level of education, low economic status and rural residence [12-14] are factors associated with partial edentulism.

This study aimed to highlight the possibilities of treating partial edentulism in a group of patients based on Kennedy classification and to establish correlations between the prevalence of partial edentulism and gender, age, residence medium. We followed the presence or absence of previous prosthetic treatments but also their type, removable or fixed. Untreated partial edentulism generates issues for both patient and dentist, its severity depending on the number, topography, age and extension of the edentulous spaces and on the capacity of the stomatognathic system to adapt to the pathological condition.

2. Materials and method

This study took place between 1st of February 2024 and 31st of December 2024, involving 98 patients, who were admitted within the Prosthetics Clinic from The

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Faculty of Dental Medicine, University of Medicine and Pharmacy of Craiova, in order to receive specialized treatment. The selected patients were male or female, originating from rural or urban areas, aged between 21 and 70 years.

The inclusion criteria were: patients of both genders, from rural or urban areas, regardless of socio-economic status, who presented to the clinic for specialized treatment during the mentioned period.

This study was approved by the Ethic Committee from the University of Medicine and Pharmacy of Craiova (no 60/29.01.2024); all patients gave their informed consent regarding the treatment and personal data management.

The examination was performed with the patients seated on the dental chair, under artificial light using the consultation kit. The examination was performed on quadrants starting from quadrant 1 and ending with quadrant 4 according to the FDI classification. The patients' personal data, general condition, dental formula (present teeth, absent teeth, previous treatments) were recorded in observation sheets. All data were counted into an Excel table. The diagrams were obtained using predefined functions of the Microsoft Office Excel 2007 application.

3. Results

The study included 98 patients, 73 female gender, representing 78.49%, and 25 male gender, representing 21.51% (Table 1).

Table 1. Distribution of patients by gender.

Gender	Female	Male	Total
Number	73	25	98
%	78,49%	21,51%	100%

Table 2. Distribution of patients by age group.

Age group	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	Total
Number	6	22	34	28	8	98
%	6,12%	22,44%	34,70%	28,57%	8,17%	100%

Patients were aged between 21 and 70 years, most of them being included in the 41-50 years age group (34 patients, representing 34.70%), followed by the 51- 60 years age group where we recorded 28 patients, representing 28.57%. The fewest patients were included in the 21-30 years age group (6 patients, representing 6.12%) and 8 patients were included into the 61-70 years age group (Table 2 and Figure 1).

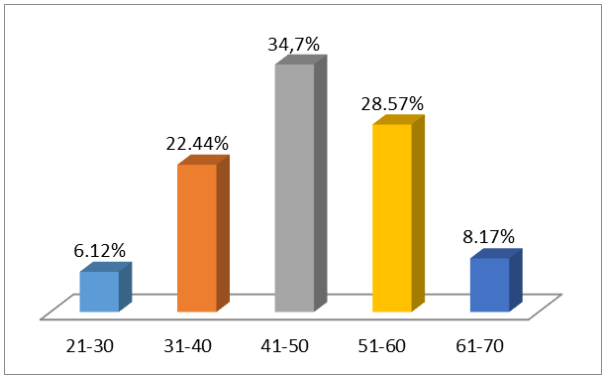

Figure 1. Distribution of patients by age group.

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Regarding the residence area, more than half of the patients, 58, had residence in urban areas, while 40 patients were resident in rural areas. Correlating the age groups with the residence areas of the patients, only in the 21-30 years age group, we recorded 4 patients from rural areas and 2 from urban areas, while in the other age groups, most of them were resident in urban areas (Table 3 and Figure 2).

Table 3. Distribution of patients according to their residence medium and age group.

Age group	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	Total
Urban	2	14	22	15	5	58
Rural	4	8	12	13	3	40
Total	6	22	34	28	8	98

Table 4. Distribution of female patients according to the edentulous arch.

Arch	Mandibular arch	Maxillary arch	Mandibular arch+maxillary arch	Total number of patients
Female patients	1	3	69	73
%	1,37%	4,11%	94,52%	100%

Table 5. Distribution of male patients according to the edentulous arch.

Arch	Mandibular arch	Maxillary arch	Mandibular arch+maxillary arch	Total number of patients
Male patients	1	3	69	73
%	1,37%	4,11%	94,52%	100%

Table 6. Distribution of patients according to the class of maxillary edentulism.

Edentulism class	Kennedy class I	Kennedy class II	Kennedy class III	Kennedy Class IV	Total
Number	15	22	58	1	96
%	15.62%	22.92%	60.42%	1.04%	100%

Table 7. Distribution of patients according to the class of edentulism in the mandibular arch.

Edentulism class	Kennedy class I	Kennedy class II	Kennedy class III	Kennedy Class IV	Total
Number	16	20	54	2	92
%	17.39%	21.74%	58.70%	2.17%	100%

Table 8. Distribution of patients according to previous treatments and gender.

Category	Previous treatments	No previous treatments	Total
Female	37	36	73
Male	17	8	25
Total	54	44	98

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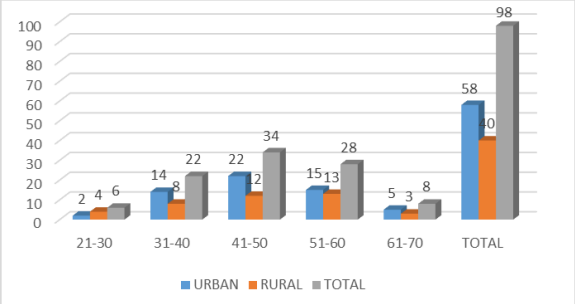

Figure 2. Distribution of patients according to their residence medium and age group.

Most of the patients included in the study, both female and male gender, presented edentulism in both arches, maxillary and mandibular. There were 69 women of 73 who presented edentulism in both arches and 3 women who presented only maxillary edentulism, the antagonist arch being intact.

Only one women presented only mandibular edentulism. As for the male patients, 21 of them, representing the majority, presented edentulism in both arches (Table 4 and Table 5).

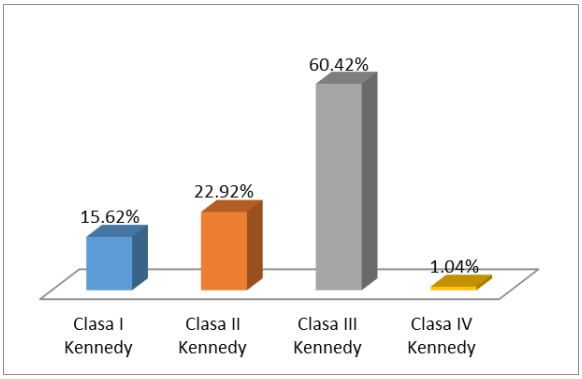

Figure 3. Distribution of patients according to the class of edentulism in the maxillary arch.

There were 96 patients of the total number of patients who presented edentulism in the maxillary arch. At this level, according to Kennedy classification, most of them (58 patients, representing 60.48%), presented Kennedy class III edentulism, followed by patients with Kennedy class II edentulism and patients with Kennedy class I edentulism. Only one patient presented Kennedy class IV edentulism (Table 6 and Figure 3).

The situation was the same in the mandibular arch edentulism - 54 pacients of the total number of 92 presented Kennedy class III edentulism, followed by patients with Kennedy class II edentulism and by those with Kennedy class I edentulism. There were 2 patients who presented Kennedy class IV edentulism (Table 7 and Figure 4).

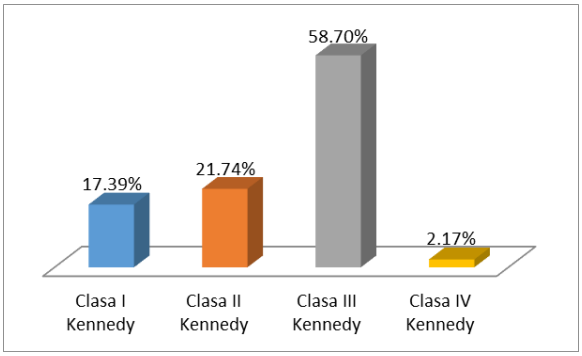

Figure 4. Distribution of patients according to the class of edentulism in the mandibular arch.

We followed the distribution of the total number of patients according to the existence of previous prosthetic treatments and the distribution of these treatments in female and male patients. There was no significant difference between the number of patients who benefited from previous prosthetic treatments and those without previous treatments - 54 presented previous treatments and 44 did not.

An almost equal number, 37 and 36 patients, was noted among women who benefited from previous prosthetic treatments and women who did not benefit from previous treatments. Among men, the difference was significant, those who benefited from previous prosthetic treatment being almost twice as numerous as those who

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did not benefit from treatment (17 patients vs 8 patients) (Table 8 and Figure 5).

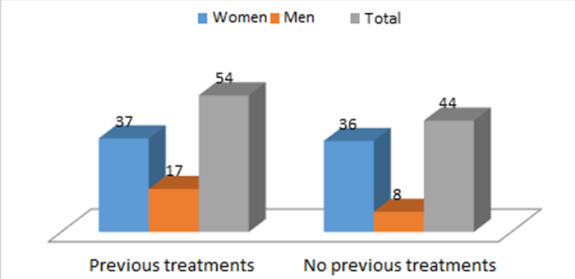

Figure 5. Distribution of patients according to previous treatments and gender.

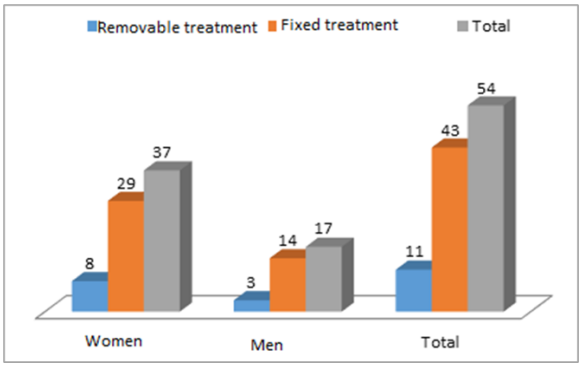

Figure 6. Distribution of patients by type of treatment and gender.

We analyzed the type of treatments, fixed or removable, in patients who presented previous prosthetic treatments.

A considerable difference was noticed between the number of fixed treatments and the number of removable treatments, thus the number of removable treatments, i.e. 11, is 4 times lower than the fixed ones, i.e. 43 (Table 9 and Figure 6).

Also, in patients with previous prosthetic treatments, we analyzed how many of them had partial prosthetics. We found that this category of patients was numerically well represented - 39 patients of the total number of 54 patients with prosthetics had partial prostethics. Only 15 patients of the total number of patients included in the study had previously had complete prosthetics. However, the difference between the two categories was higher among women and lower among men (Table 10 and Figure 7).

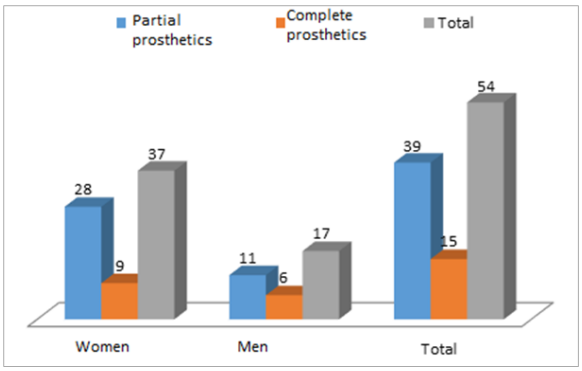

Figure 7. Distribution of patients according to the type of treatment.

Table 9. Distribution of patients by type of treatment and gender.

Category	Removable treatment	Fixed treatment	Total
Female	8	29	37
Male	3	14	17
Total	11	43	54

Table 10. Distribution of patients according to the type of treatment.

Category	Partial prosthetics	Complete prostethics	Total
Female	28	9	37
Male	11	6	17
Total	39	15	54

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4. Discussion

Modern dentistry requires the preservation of natural teeth for as long as possible, which produces a decline in the existence of complete prosthesis and an increase in the number of partial prosthesis and fixed or implant-prosthetic dentures. The common requirement of partially edentated patients is represented by the replacement of the absent teeth, which must be achieved by means that minimize the risks and problems of the partial edentulism. Future dental prosthesis must restore the phonetic, masticatory and swallowing function, must improve the aesthetic appearance and preserve the remaining teeth for as long as possible. All of this contributes to the normal functioning of the stomatognathic system and the quality of life [15]. There are over 65 000 possible combinations of the edentulous breaches according to studies over time [16].

Our study, including 98 patients, aged between 21 and 70 years, 78.49% being female patients and 21.51% being male patients, was compared to another study conducted between 2011-2013, which included 305 patients aged between 29 and 82 years, diagnosed with partial edentulism, 52.79% of patients being attributed to the female gender and 47.21% of patients being attributed to the male gender [17]. The study conducted by Feier R. D. et al. showed that depending on the residence medium, the statistics are as follows: 22.30% had rural residence and 77.70% had urban residence. There were 28.85% patients with previous prosthetic treatments and 71.15% without previous prosthetic treatments [17]. Most of the patients included in our study had urban residence, but there was no significant difference between the urban and rural categories. Also, there was an insignificant difference between the number of previous prosthetic treatments and those without previous prosthetic treatments.

According to the study conducted by Hassan Naveed, regarding gender distribution, partial edentulism was found in 77.1% among men and 22.9% among women [16]. The frequency of partial edentation was higher for the mandibular arch (67.4%) compared to the maxillary arch, where it was present in a percentage of 63.2% [17]. Regarding the gender of the patients in our study, women were almost three times more numerous than men and the majority had edentulism in both arches [18;19]. One study classified Kennedy class III edentulism as the most frequent edentulism class with a percentage of 20.3%, followed by Kennedy class I with a frequency of 18.3% [17]. The situation was similar in our study regarding Kennedy class III edentulism, which was also the most frequent type of edentulism. There was a difference regarding Kennedy class II edentulism, which holded the second place as frequency in our study. Another study conducted in 2011 classified Kennedy class I edentulism as being in the first place as frequency, while Kennedy class IV edentulism was classified as the least frequent edentulism type. Similar results regarding Kennedy class IV edentulism were obtained in our study, also [15].

Our results are similar to those in another sudies[20]. In the study conducted by Zaigham A.M. et al. in 2010 on 367 patients aged between 20 and 70 years, Kennedy class I being represented by 11.4% of the total patients, Kennedy class II by 19.6% of the

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included patients and Kennedy class IV by 4% of the patients. The most numerous category was represented by Kennedy class III edentulism, representing 44.4% of the total number of patients [21].

Among patients with previous prosthetic treatments, a considerable difference was noticed between the number of those with fixed treatments and the number of those with removable treatments, thus the number of those with removable treatment was four times lower than the number of those with fixed treatment. Also, in most patients with previous treatments, these were only partially performed; there were patients with Kennedy class I and class II edentations with modificationes, to whom treatments were performed only in the intercalated spaces [22,23].

5. Conclusions

The majority of patients included in our study, both female or male gender, presented edentulism in both arches. The highest prevalence of the edentulism class, both in the maxillary and mandibular arches, is represented by Kennedy class III, in a close percentage (60.42% in the maxillary arch and 58.70% at the mandibular arch).

More than half of the patients in our study had benefited from previous prosthetic treatments - two thirds of these were treated fixed, and one third were treated removable.

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Author contributions

All authors read and approved of the final manuscript. All authors have equally contributed to this work.

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Conflict of interest statement

There are no potential conflicts of interest concerning this study.

Data availability statement

Data availability at request.

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