Primljen / Received on: 08. 08. 2023.
Revidiran / Revised on: 05. 09. 2023.
Prihvaćen / Accepted on: 16. 09. 2023.

ORIGINALNI RAD
ORIGINAL ARTICLE
doi: 10.5937/asn2490863P

PROCENA PARODONTALNOG STATUSA KOD PACIJENATA SA FIKSNIM PROTETSKIM NADOKNADAMA

ASSESSMENT OF PERIODONTAL STATUS AMONG PATIENTS WITH FIXED PROSTHETIC RECONSTRUCTIONS

Petrovski Mihajlo[1], Stojanović Simona[2], Petrović Milica[2], Mladenovski Marko[1], Nikolovski Bruno[1], Stavreva Nataša[3], Veljanovski Darko[1], Apostoloski Pavle[1]

[1] FAKULTET MEDICINSKIH NAUKA, UNIVERZITET GOCE DELČEV, ŠTIP, SEVERNA MAKEDONIJA
[2]UNIVERZITET U NIŠU, MEDICINSKI FAKULTET, NIŠ, SRBIJA
[3] UNIVERZITET SVETI ĆIRILO I METODIJE, STOMATOLOŠKI FAKULTET, SKOPLE, SEVERNA MAKEDONIJA

[1]FACULTY OF MEDICAL SCIENCES, GOCE DELCEV UNIVERSITY, STIP, NORTH MACEDONIA
[2]UNIVERSITY OF NIŠ, FACULTY OF MEDICINE, NIS, SERBIA
[3]SS. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE, FACULTY OF DENTISTRY, SKOPJE, NORTH MACEDONIA

Sažetak

Cil: *Imajući u vidu značaj parodontalnog zdravlja zuba koji nose fiksne protetske konstrukcije, postavili smo osnovni cilj - proceniti zdravlje parodonta kod ispitanika koji su imali fiksne protetske rekonstrukcije u jednom regionu iz Republike Severne Makedonije.*
Materijal i metod: *Istraživanje je sprovedeno u pet stomatoloških ordinacija. Za svakog pacijenta tokom kliničkog pregleda utvrđeni su sledeći parametri koji se odnose na potporne zube fiksno-protetskih rekonstrukcija: navike oralne higijene, dubina parodontalnih džepova i klinički gubitak pričvršćivanja, prisustvo recesije gingive, stepen upale gingive i prisustvo lokalnog iritirajućih faktora koji mogu uticati na potporna tkiva zuba koji nose protetske uređaje.*
Rezultati: *Nakon obrade podataka, konstatovano je da je procenat ispitanika koji ne peru zube 20%. Većina ispitanika je imala umerene inflamatorne promene gingive. Prosečna vrednost za dubinu parodontalnih džepova bila je 5,5±0,7 mm, a za klinički gubitak pričvršćivanja 4,2 ± 0,2 mm. Prisustvo recesije gingive je vizuelno utvrđeno kod 31,66 % ispitanika. Najčešći predisponirajući faktor bilo je neadekvatno modeliranje fiksno-protetskih aparata. 48,33% ispitanika ima vertikalni gubitak koštane mase potvrđen radiografskim promenama.*
Zaključak: *Parodontalni problemi kod pacijenata koji nose fiksne protetske nadoknade su značajno izraženi, zbog nedovoljnog održavanja oralne higijene od strane pacijenata, kao i neredovnih odlazaka na stomatološke preglede. Veoma je važno da se fiksno-protetske nadoknade pravilno urade i adaptiraju.*

Ključne reči: *parodontalno zdravlje, gingivitis, fiksno-protetski uređaji, parodoncijum*

Corresponding author:
Ass. Prof. Mihajlo Petrovski, DMD, PhD
Faculty of Medical Sciences,
Goce Delčev University,
Štip, North Macedonia
mihajlo.petrovski@ugd.edu.mk

Abstract

Aim: *Recognizing the importance of periodontal health for teeth with fixed prosthetic constructions, the main goal of the present study was to assess the periodontal health of respondents who underwent fixed prosthetic reconstructions in one region of the Republic of North Macedonia.*
Materials and Methods: *Research was conducted in five dental offices. For each patient, the following parameters related to the supporting teeth of the fixed prosthetic reconstructions were determined: oral hygiene habits, periodontal pockets depth and clinical loss of attachment, presence of gingival recession, degree of gingival inflammation and presence of local irritating factors that can affect the supporting tissues of the teeth wearing the prosthetic devices.*
Results: *After processing the data, it was noted that the percentage of subjects who did not brush their teeth was 20%. Most of the subjects had moderate gingival inflammatory changes. The average value for periodontal pocket depth was 5.5 ± 0.7 mm, and for clinical loss of attachment, it was 4.2 ± 0.2 mm. The presence of gingival recession was visually determined in 31.66% of subjects. The most commonly predisposing factor was inadequate modelling of the fixed prosthodontic appliances. Forty-eight point thirty-three percent of the subjects had vertical bone loss confirmed by radiographic changes.*
Conclusion: *Periodontal problems among patients that wear fixed prosthetic reconstructions are significantly pronounced, due to insufficient maintenance of oral hygiene by the patients, as well as irregular dental examinations. It is of great importance that the fixed prosthetic reconstructions are properly made and properly adapted.*

Key words: *periodontal health, gingivitis, fixed prosthodontic devices, periodontium*

Introduction

In contemporary dentistry, periodontal health is a crucial precondition for effective comprehensive treatment. Because periodontal health and dental restorations are intimately intertwined, both the fixed prosthetic restorations and all other restorations depend on periodontal health for properly functioning. Understanding the contribution of the restoration to the formation of dental plaque and the onset of periodontal disease is crucial.

Dental practitioners can effectively check and evaluate patients' oral and periodontal health if they have a fundamental understanding and knowledge of the periodontium[1]. In the assessment of the initial diseases that occur at the level of the periodontium, the first changes occur primarily in the gingiva. Furthermore, the gingiva is the only part of the periodontium that can be examined clinically[2]. Knowing that a healthy gingiva has a coral-pink color, any alteration in this color will signify the existence of an illness. It should be mentioned that the wearing of the fixed prosthetic reconstructions also causes alterations in the gingiva.

The loss of the periodontal tissues, including the resorption of the alveolar bone, is a hallmark of periodontal disease, an inflammatory condition of the periodontal tissues that eventually results in tooth loss[3]. It is commonly known that perio-pathogenic bacteria, the host's compromised immune system, and different local irritants that are present can cause periodontal inflammatory diseases[4,5,6]. For these reasons, patients frequently opt for prosthetic restorations due to the disruption of the tooth's anatomical-morphological properties or the loss of the tooth.

Patients receiving therapy with fixed prosthetic reconstructions are treated to achieve the following fundamental objectives:

1) To replace lost teeth
2) To restore the function of the dental system
3) To enhance aesthetics and
4) To maintain the periodontal tissues' health.

Proper diagnosis and treatment plan are crucial for patients to regain function and appearance. It is also crucial that fixed prosthetic restorations are well-made and polished, meaning they have the potential to self-clean, and they are aesthetically pleasing to maintain the health of the periodontal tissues and, consequently, the periodontal support. This will keep food remains from getting dipper in the gingival sulcus and minimize the amount of dental plaque, protecting the teeth's supporting structure. Many periodontal alterations will frequently emerge as a result of poorly and inadequate constructed restorations[7].

The final fixed prosthetic restorations that will be cemented need to be thoughtfully designed and have a harmonious relationship with the periodontium.

The potential for invasion of the gingiva's biological width is one of the most crucial things to think about and evaluate since it can lead to gingival inflammation, a loss of connective tissue and bone loss. It should also be kept in mind to prevent any harmful effects on the periodontium as well as to prevent and maintain the health of the gingiva.

Crowns and bridges should not be overextended in any direction and should be as smooth as possible with supragingival margins placed whenever possible. According to Jernberg et al.[8], in this way, the impaction of the food remains, and thus the accumulation of dental plaque, will be prevented. Fixed prosthetic devices must have a protective and preventive role in maintaining the health of all parts of the dental system[9].

Clinicians in their daily routine must and should pay special attention to the assessment of oral hygiene[10]. Especially in patients with fixed prosthetic devices, the physiological process of self-cleaning can be limited or completely impossible. Locations susceptible to the accumulation of dental plaque are mostly the marginal gingiva around the crowns, contact surfaces and bridge connectors. These areas require increased care in removing all food debris and accumulated plaque. Due to inadequate marginal adaptation[11], rough surfaces of the restoration and overextended contoured restorations[12], localized inflammation of the periodontium related to the fixed prosthetic reconstruction, can occur. Thus, the fixed prosthetic construction must allow adequate cleaning procedures. Educating patients about the importance of oral hygiene leads to an improvement in the level of hygiene[13]. Therefore, patients should be instructed in the appropriate way to clean teeth and prosthetic restorations, as well as to use additional tools for cleaning that allow more efficient removal of dental deposits.

Frequent careful professional cleaning of the teeth of patients with fixed prostheses helps to maintain satisfactory oral hygiene[14], thereby preventing further progression of the inflammatory component in depth. As already mentioned, failure can occur as a consequence of errors made during the treatment planning or construction process, but it can also be reflected due to inadequate care of the prosthetic construction by the patient. There are many studies on this topic, which indicate

that fixed prosthetic restorations lead to an increased accumulation of dental plaque, which in turn has a negative impact on the condition of the gingiva, due to insufficient and inadequate care, although there are authors who do not report a statistically significant difference in the values related to the presence of dental plaque between the teeth that have fixed prosthetic restorations in relation to the compared teeth, i.e., teeth that do not carry fixed prosthetic constructions[15,16].

Factors associated with prosthetic restorations such as crown margin, poor marginal adaptation, inadequate restoration contours, and rough margins are often associated with periodontal tissue inflammation[17]. Other studies have shown that insufficient oral hygiene is an important factor in the development of inflammatory changes of the oral mucosa under the bridge constructions[18]. This can lead to a reduced ability to load the tooth carriers of the fixed prosthetic structure, and thus to the reconstruction. The success of fixed prosthetic reconstructions, however, is only seen if the restoration remains in place for as long as possible and does not cause disease[19].

Therefore, periodontal assessment around prosthetic work is of the utmost importance in clinical dentistry, especially when identifying risk indicators for adverse events. A healthy periodontium is a basic prerequisite for the functional value of fixed devices. All restorations are good only if they do not have a harmful effect and functionally fit into the tissue of the body[20].

In a certain number of cases that have undergone periodontal treatment, the remaining healthy periodontium may be unable to resist the action of masticatory forces. Therefore, in such cases, it is necessary to make a correct assessment of whether the tooth will be used as a carrier of a prosthetic appliance, if it should be left out of the plan, or if it needs to be removed due to advanced periodontal disease[21].

Considering the previously stated facts that refer to the periodontal health of the teeth that are carriers of fixed prosthetic reconstructions, the main goal of this paper was to assess the periodontal health of respondents who underwent fixed prosthetic reconstructions in one region of the Republic of North Macedonia. Recognizing the importance of the periodontal tissues and their health on fixed prosthetic reconstructions, as well as their longevity, it is crucial to determine the prevalence, representation and the type of periodontal changes that are present in people with fixed prosthetic reconstructions.

Materials and Methods

In order to realize the set main goal, a research involving five dental offices (two with specialist for dental prosthetics and three offices for general dentistry) was conducted in the period from June to August 2024. A cross-sectional study referring only to a current assessment of conditions was performed.

The examination included a total of 60 subjects wearing fixed prosthetic devices who visited these dental offices. The age of the study population was between 40 and 80 years old.

When conducting the examination, all respondents who did not cooperate due to various behavioral disorders, aggression or did not allow a clinical examination to be performed were excluded from the examined population. The subjects must have used the fixed prosthetic devices for at least 6 months, and periodontal treatment should not have been performed for at least six months.

Regarding the exclusion criteria for the examined subjects from the medical anamnesis, it was necessary to confirm that the patients were free from acute or chronic diseases (diabetes mellitus, uremia, blood diseases, autoimmune diseases, etc.). Also, all persons undergoing therapy with drugs that could have an impact on the gingiva and oral mucosa were excluded from the examined group.

When performing the clinical examination, the basic postulates for preserving the patient's privacy and dignity were always respected.

The subjects underwent an extraoral examination of the neck and maxillofacial region in order to observe changes in this region of the body. This was followed by an intraoral examination in order to objectively observe the changes, as well as the state of the patients' oral health as a whole. A dental probe and a dental mirror and disposable gloves were used during the examination. Disposable materials were stored in appropriate medical waste storage areas. The instruments used after the examination, were subjected to the appropriate protocol for disinfection and sterilization of the instruments in the dental office.

For each patient during the clinical examination, the following parameters related to the supporting teeth of the fixed prosthetic reconstructions were determined:

- Oral hygiene habits

- Depth of the periodontal pockets(PD) and the clinical loss of attachment (CAL)
- Presence of gingival recession
- Degree of gingival inflammation and
- Presence of local irritating factors that can additionally affect the supporting tissues of the teeth.

In the majority of epidemiological studies, sequential probing of periodontal pockets is performed to determine the conditions of periodontal tissues. The measurement may refer to the depth of the periodontal pockets or the clinical loss of attachment.

The depth of the periodontal pockets was determined for each of the present pockets of the teeth supporting fixed orthotic constructions. The largest measured dimension related to the depth of the periodontal pocket was taken as a value of comparison in the examination to determine the greatest degree of destruction of the periodontal tissues of these teeth.

However, despite the approximate determination of the depth of the periodontal pockets, to prevent subjective and interpersonal differences in the measurement of the depth of the periodontal pockets and the clinical loss of attachment, only one person participated.

The presence of gingival recession among subjects was determined clinically as visual extension of the tooth and exposure of the root. Recession values were determined by measuring the distance from the enamel-cement junction (ECJ) to the marginal edge of the marginal gingiva.

The assessment of gingival inflammation was done with the Gingival Index of Loe and Silness (1963). The assessment of the progress of gingivitis in this index is based on changes in the color, configuration and consistency of the gingiva, as well as on the presence of bleeding on probing. For the purposes of this research, a modification was made so that instead of the representative group of teeth, the research was performed on all teeth supporting fixed prosthetic reconstructions. Grading of gingival changes was done according to the following quantitative criteria:

0 - There were no gingival changes but a normal gingival configuration (the gingiva was pale pink in color, with a firm and fine-grained configuration, without the presence of edema or ulceration);

1 - Mild inflammation characterized by a slight change in color, i.e. the gingiva was slightly reddened, there was light edema, and no bleeding occurs during probing;

2 - Moderate inflammation characterized by moderate redness, moderate edema, the gingiva became smooth, and bleeding occurred on probing;

3 - Strong inflammatory changes of the gingiva characterized by strong redness, presence of strong edema and tendency to spontaneous gingival bleeding, enlargement of the gingiva as well as the presence of ulcerations.

The examination was performed by gentle probing in the gingival sulcus or periodontal pocket. When estimating the final values for a subject, if the index value was between 0.1 and 1.0, it was a mild inflammation of the gingiva, values from 1.1 to 2.0 indicated moderate gingival inflammation, while values above 2.1 indicated severe gingivitis.

During the intraoral examination, the characteristics of the prosthetic reconstructions necessary for the preservation of periodontal health were determined. Such features included optimal marginal closure, contours and occlusal surface. Due to the negative effect of the supporting tissues of the teeth, the following participating factors were determined for each of the examinees: inadequate edge closure of the fixed prosthetic device, insufficient dimensioning and modeling of the fixed prosthetic reconstructions or their roughness.

In all subjects, a radiological status was made to assess the level of the alveolar bone. The retro-alveolar intraoral images, as well as the panoramic extraoral images, were used from the X-ray examinations. The recordings were read and discussed on a negatoscope.

The data obtained from the anamnesis and clinical examination after they were collected were appropriately statistically processed using special software for statistical data processing Statistica 7.1.

Results

The research included an equal number of subjects who visited specialist and general dentistry offices, that is, the examination of 30 subjects was done in specialist offices, while the examination of the remaining 30 subjects was conducted in general dentistry offices.

Also the number of male and female subject were equal.

In the forthcoming text, the data related to the subjective attitudes toward oral health and oral hygiene of the respondents were processed.

The number of people who did not maintain regular oral hygiene—the percentage of people who did not brush their teeth at all was quite small, 20% of the examined people (Figure 1). Only three subjects (5%) used additional chemical-pharmacological agents for disinfection of the oral cavity or prosthetic devices. Further, none of the subjects used dental floss or an interdental brush and only seven subjects (11.66%) brushed their teeth two to three times during the day.

Figure 2 shows the obtained values that refer to the values obtained for the Gingival Index of Loe and Silness (1963). According to the present research, most of the subjects had moderate inflammatory changes and women had greater inflammatory changes, i.e., 65% of women compared to 42% of men (Figure 3).

The assessment of periodontal status was done by determining the depth of periodontal pockets and by determining the clinical loss of attachment. A high prevalence of periodontal disease was observed. The average value related to the depth of periodontal pockets was 5.5 ± 0.7 (range from 2.5 to 6.7, with a confidence interval from 5.3 to 6.8). The average value referring to the clinical loss of attachment was 4.2 ± 0.2 (range from 2.3 to 6.2, with a confidence interval from 3.1 to 4.2). Hence, it was observed that most of the examined population had a moderate form of periodontal disease.

Out of the total number of subjects, the presence of gingival recession was visually determined in 19 (31.66 %) subjects (Figure 4).

Due to the negative effect of the supporting tissues of the teeth, the following contributing factors were determined for each of the subjects: inadequate marginal closure of the fixed prosthetic device, inadequate dimensioning and modeling of the fixed prosthetic reconstructions or their roughness. Figure 5 shows the presence of such predisposing factors.

At the end, an analysis of X-rays of the tissues around the teeth supporting the fixed-prosthetic constructions was made. The data related to the analysis of X-rays were made only for 34 subjects who had retroalveolar or orthopantomographic images. The results were read in retroalveolar or orthopantomography images. For the existence of horizontal bone loss, the value of two millimeters between the limbus alveolaris and the enamel-cement border was taken as the limit. Any distance greater than two millimeters was considered bone resorption. Such a value of tissues around the teeth supporting fixed-prosthetic devices was determined in 29 of the subjects, that is, in 48.33% of the examined population (Figure 6).

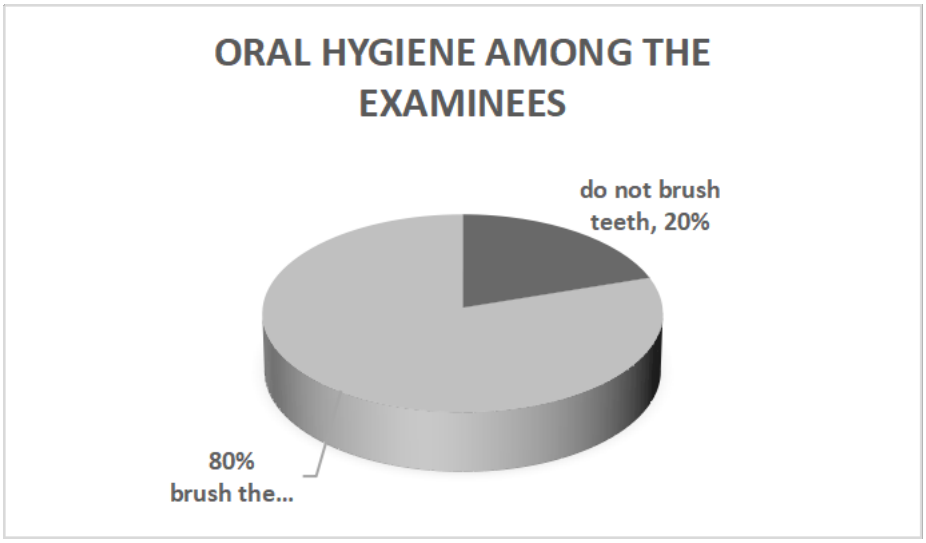

Figure 1. Oral hygiene among the examinees

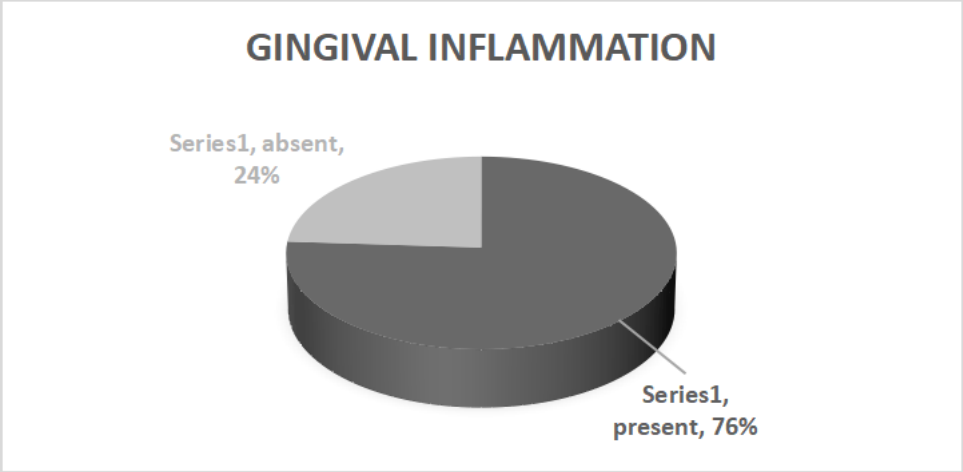

Figure 2. Presence of gingival inflammation

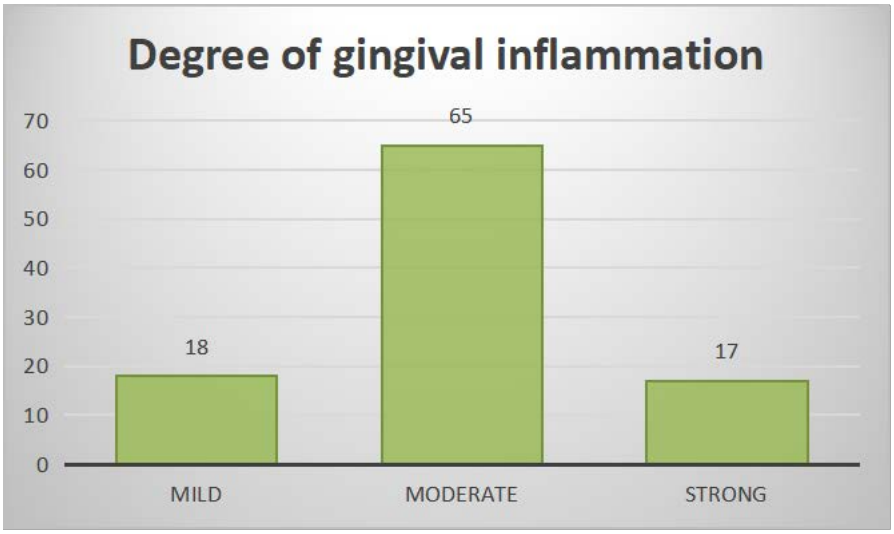

Figure 3. Degree of gingival inflammation

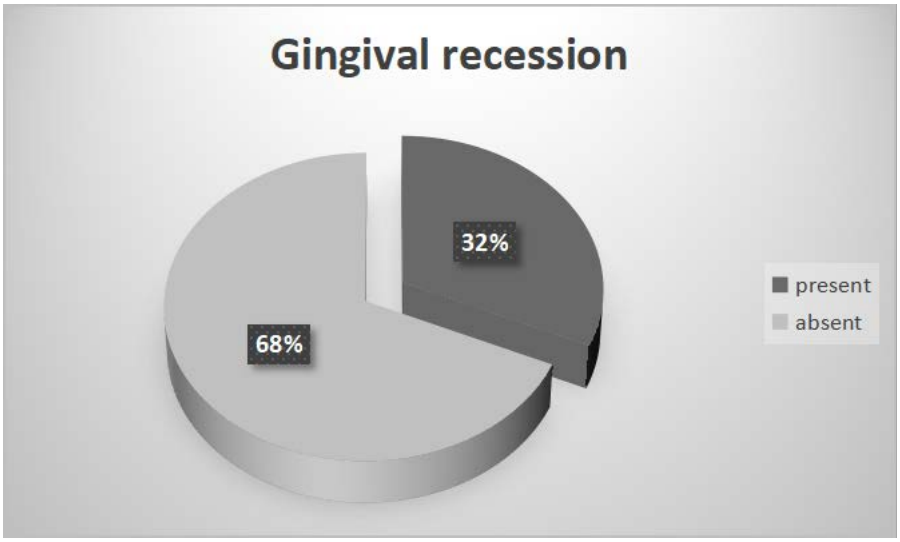

Figure 4. Presence of gingival recession

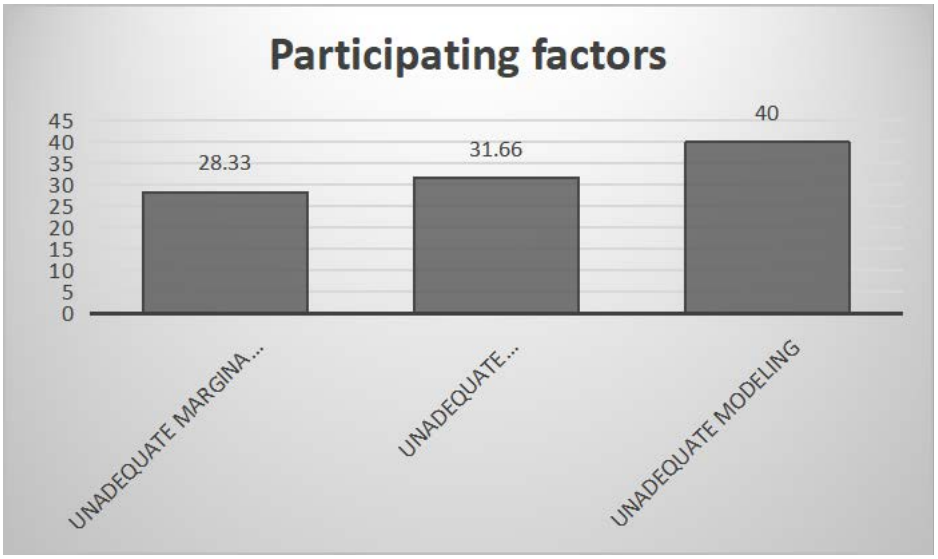

Figure 5. Presence of participating factors

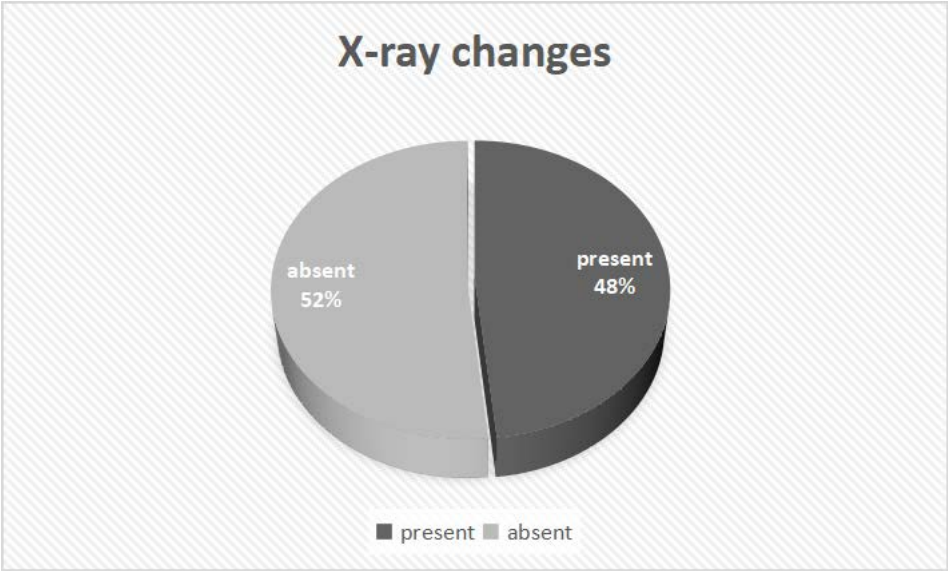

Figure 6. X-ray changes

Discussion

This study refers to the assessment of periodontal support in people with fixed prosthetic reconstructions. It is a cross-sectional study and all results presented in it are original.

Comparison of the data from this study with other epidemiological studies is complex due to the existence of numerous variations regarding the diagnostic methodology and criteria between different studies. A special problem is the lack of multiple published data on this problem in our country, which takes away any possibility of comparison with our data. But, this is precisely what increases the significance of our study which covers dental practices from only one region of the Republic of North Macedonia.

Adequate understanding of the relationship between periodontal tissues and restorative dentistry is essential for achieving proper form, function, aesthetics and comfort of the dentition. While most clinicians are

aware of this important relationship, uncertainty remains regarding specific concepts such as biological gingival width and indications and applications for crown lengthening.

The impact of fixed-prosthetic reconstructions on periodontal health has been investigated by numerous authors. Thus, Srimaneepong et al.[22] determined the relationship between the marginal adaptation of the tooth by fixed prosthetic reconstructions and the health of the periodontal tissues. Their results determined that there was a significant quantitative relationship between marginal crown discrepancy and gingival and periodontal inflammation.

Regardless of the type of treatment, consistent and permanent home care and, of course, professional prophylaxis are necessary for patients with fixed-prosthetic reconstructions.

Subgingival restorative margins of fixed-prosthetic reconstructions are associated with the development of plaque-related inflammatory periodontal disease, primarily due to a change in the subgingival microflora from a health-related to a disease-related profile[23].

The degree of marginal inflammation is influenced by four factors: (1) failure to maintain an adequate microorganism profile, (2) inability to adequately close the margins of fixed-prosthetic reconstructions, (3) placement of the gingival margins of fixed-prosthetic reconstructions in the area of attachment gingiva and (4) violation of biological width[24]. Placement of the margins of fixed-prosthetic reconstructions in the supragingival region is the location of choice for all restorative margins regardless of the reconstruction to avoid iatrogenic injury to the periodontal tissues[25]. However, consideration of these four factors will help in reducing the negative impact of the edges of fixed prosthetic constructions that in certain cases must be placed subgingivally.

What is important to note is the fact that both clinically deficient restorations, as well as clinically acceptable restorations, can contribute to gingivitis. However, recent research and evidence do not show increased clinical attachment loss near crowns or fixed partial dentures. During fixed prosthetic reconstruction, it is necessary to document the periodontal health before the prosthetic therapy and periodically after the placement of the restoration, so that each tooth will serve as its own control. Also, the patient's own history of periodontal disease, the impact of the restoration on the formation of dental plaque and the composition of the periodontal microflora must be recorded. In that way, all the reactions of the periodontal tissue after the placement of artificial crowns and bridges, as well as fixed partial dentures, would be revealed.

In their research, Chadwell et al.[26] determined a linear regression model concerning the years of use of the prosthetic devices and the number of lost prosthetic devices. Also, according to the authors, there is no possibility of predictability regarding the possibility of losing prosthetic aids.

According to Axelsson et al.[27], gingivitis and localized periodontal disease were mainly associated with unacceptable hygiene but were also observed in association with satisfactory restorations. However, the authors in their research do not indicate the possible reasons for this phenomenon.

Strategic decisions in the choice of a certain design of partial dentures supported by fixed prosthetic reconstructions and the choice of teeth or implants as carriers seem to influence the risks of complications that can be expected concerning the fixed reconstruction. If possible, extension of carrier teeth should be avoided or used only after careful clinical evaluation of all options.

In a trial conducted by Müller, patients were treated for existing periodontal disease and called for prophylaxis sessions once every 2 or 3 months. The clinical data after the examination indicated a slight inflammation of the gingival tissues of teeth with crowns located subgingivally. In contrast, in teeth with crowns that have edges placed supragingivally, marginal tissues showed little or even no clinical signs of inflammation[28].

The high prevalence of periodontal pockets and the average occlusion of 5 mm observed in the majority of subjects in the present study coincide approximately with the study of Napankangas and Raustia[29]. The data collected in our study population concerning gingival inflammation, showed a value of 43.3%. This value differs from the data obtained by Napankangas and Raustia29 which reported that gingival bleeding occurred in only 12% of the subjects.

The present research showed that the most common reason for applying fixed prosthetic constructions was the loss of one or more teeth or the unsatisfactory appearance of the tooth or previously existing prosthetic reconstruction, which was expected. This finding aligns with numerous studies conducted worldwide.

Despite the fact that the largest number of subjects do not have all their teeth and have empty spaces in their dental arches (the average number of teeth in our research among the respondents is 14.7 ± 6.8), still, the number of fixed prosthetic restorations, and in general prosthetic aids among these respondents do not satisfy.

The results related to the X-ray evaluation of the periodontal conditions indicate that vertical loss of the alveolar bone is present in 65% of the subjects. Similar data were obtained by Lungren et al.[30], although in their randomized controlled clinical trial that included subjects partially susceptible to periodontitis, it was found that the loss of bone mass during the first year of operation, as well as every year after, was significantly small. The results of this study show that the functional capacity of extension bridges is good in patients despite the severe loss of periodontal tissues. Additionally, the masticatory effectiveness achieved with these bridges is comparable with the forces in people with natural teeth.

Recession is not only a loss of gingival tissue, it involves a clinical loss of attachment and loss of alveolar bone, as well as all those tissues under the gingiva, all of which occur simultaneously. Numerous factors affect the appearance of gingival recession, but it must be noted that a significant factor in the appearance of gingival recession is fixed-prosthetic reconstructions. Inadequate marginal closure, improper techniques for their cleaning, as well as inadequate premature contacts can further complicate the condition of the periodontium. According to our research, the presence of gingival recession was visually determined in 36.66% of the total number of respondents. The presence of gingival recession refers to the action of the previously mentioned iatrogenic factors, but also to the inadequacy of brushing techniques, which is why dentists themselves have the task of individually adjusting brushing techniques to meet the needs of individual patients.

The high prevalence of mobility of the supporting teeth is expected and likely occurs because some teeth are tied in bridge structures or in block crowns. Additionally, one tooth may possess significantly greater strength, which can contribute to the reduced mobility of the other tooth. We believe that the mobility observed in our subjects, particularly in teeth bearing prosthetic constructions, can be a consequence of: inflammation of the gingiva and periodontium, the present profunctional habits, premature contact of the teeth, loss of alveolar bone, etc. The luxation of the supporting teeth of the fixed-prosthetic reconstructions is usually reversible, unless it results from substantial loss of the supporting tissue, which may prevent the full restoration of tooth stability. It has been published in the literature that the probability of restoring the stability of the tooth is inversely proportional to the degree of loss of the tooth-supporting tissues[31].

Conclusion

Periodontal problems among patients who wear fixed prosthetic reconstructions are significantly pronounced. This is mostly due to insufficient maintenance of oral hygiene by the patients, as well as irregular visits to dental examinations. It is of great importance that the fixed-prosthetic reconstructions are properly made and properly adapted, with or without the presence of premature contacts, and that patients maintain adequate oral hygiene. Fixed prosthetic reconstructions need to be checked regularly and continuously, because the inspection contributes to a healthy periodontium and a longer lifespan of the prosthetic reconstructions.

Conflicts of Interest

The authors declare that they have no conflict of interest.

Financial Support: None

LITERATURA/REFERENCES

1. Armitage GC. The complete periodontal examination. Periodontology 2000. 2004 Feb;34(1):22-33.
2. Perry DA, Beemsterboer P. Periodontology for the dental hygienist. Essex G, editor. Saunders Elsevier; 2007.
3. Nazir MA. Prevalence of periodontal disease, its association with systemic diseases and prevention. International journal of health sciences. 2017 Apr;11(2):72.
4. Topić B. Parodontologija: biologija, imunopatogeneza, praksa. Stomatološki fakultet; 2005.
5. Van Dyke TE. The management of inflammation in periodontal disease. Journal of periodontology. 2008 Aug;79:1601-8.
6. Graves D. Cytokines that promote periodontal tissue destruction. Journal of periodontology. 2008 Aug;79:1585-91.
7. Andreana S. Restorative options for the periodontal patient. Dental Clinics of North America. 2010 Jan 1;54(1):157.
8. Jernberg GR, Bakdash MB, Keenan KM. Relationship between proximal tooth open contacts and periodontal disease. Journal of Periodontology. 1983 Sep;54(9):529-33.
9. Becker CM, Kaldahl WB. Current theories of crown contour, margin placement, and pontic design. Journal of Prosthetic Dentistry. 2005 Feb 1;93(2):107-15.
10. Moldoveanu LE, Dima CL, Vasile M. A Pilot Study of the Assessment of Fixed and Removable Oral Prosthetic Needs of Over 55-Year-Olds who Attended the Social Centre for Dentistry in Constanta, Romania, Between January 2009 and January 2010.
11. Lang NP, Kiel RA, Anderhalden K. Clinical and microbiological effects of subgingival restorations with overhanging or clinically perfect margins. Journal of clinical periodontology. 1983 Dec;10(6):563-78.
12. Vasconcelos FS, Neves AC, Cunha LG, Rode SD. Influence of anatomic reference on the buccal contour of prosthetic crowns. Brazilian oral research. 2009;23:230-5.
13. Vasconcelos LC, Vasconcelos LC, Ghersel EL, Veloso DJ, Cunha PÂ. Denture hygiene: importance in denture stomatitis control. RGO. Revista Gaúcha de Odontologia (Online). 2013 Jun;61(2):255-61.
14. Belser UC, Strub JR, Buser CE. Effect of controlled oral hygiene procedures in patients with fixed prostheses. Schweizerische Monatsschrift fur Zahnheilkunde= Revue Mensuelle Suisse D'odonto-stomatologie. 1980 May 1;90(5):484-94.
15. Zlatanovska K, Dimova C, Zarkova-Atanasova J, Korunoska Stevkovska V, Gigovski N, Kocovski D. Oral hygiene in patients with fixed prosthodontic restorations. Journal of Hygienic Engineering and Design. 2017;21:83-9.
16. Stipetić J, Čelebić A, Jerolimov V, Vinter I, Kraljević S, Rajić Z. The patient's and the therapist's evaluation of bridges of different materials and age. Collegium antropologicum. 2000 Jun 16;24(1):25-9.
17. Knoernschild KL, Campbell SD. Periodontal tissue responses after insertion of artificial crowns and fixed partial dentures. The Journal of prosthetic dentistry. 2000 Nov 1;84(5):492-8.
18. TOLBOE H, ISIDOR F, BUDTZ-JÖRGENSEN EJ, KAABER S. Influence of oral hygiene on the mucosal conditions beneath bridge pontics. European Journal of Oral Sciences. 1987 Dec;95(6):475-82.
19. Al-Wahadni AM, Mansour Y, Khader Y. Periodontal response to all-ceramic crowns (IPS Empress) in general practice. Int J Dent Hyg. 2006;4(1):41-6.
20. Ivanković A. Topić B. Jatrogeni uzroci parodontalnih oboljenja–neadekvatne fiksne konstrukcije. Stomatol Glas Srb. 1977:228-31.
21. Lai JY. Clinical periodontology and implant dentistry 2017.
22. Srimaneepong V, Heboyan A, Zafar MS, Khurshid Z, Marya A, Fernandes GVO, Rokaya D. Fixed Prosthetic Restorations and Periodontal Health: A Narrative Review. J Funct Biomater. 2022 Feb 1;13(1):15.
23. Reeves WG. Restorative margin placement and periodontal health. The Journal of Prosthetic Dentistry. 1991 Dec 1;66(6):733-6.
24. Sarandha DL. Effects of location of gingival finish lines on periodontal integrity. Journal of Nepal Dental Association| 2013 Jan;13(1).
25. Becker CM, Kaldahl WB. Current theories of crown contour, margin placement, and pontic design. The Journal of prosthetic dentistry. 1981 Mar 1;45(3):268-77.
26. Reeves WG. Restorative margin placement and periodontal health. The Journal of Prosthetic Dentistry. 1991 Dec 1;66(6):733-6.
27. Axelsson P, Nyström B, Lindhe J. The long-term effect of a plaque control program on tooth mortality, caries and periodontal disease in adults: results after 30 years of maintenance. Journal of clinical periodontology. 2004 Sep;31(9):749-57.
28. Müller HP. The effect of artificial crown margins at the gingival margin on the periodontal conditions in a group of periodontally supervised patients treated with fixed bridges. Journal of Clinical Periodontology. 1986 Feb;13(2):97-102.
29. Näpänkangas R, Raustia A. Twenty-year follow-up of metal-ceramic single crowns: a retrospective study. International Journal of Prosthodontics. 2008 Jul 1;21(4).
30. Lundgren D, Nyman S, Heijl L, Carlsson GE. Functional analysis of fixed bridges on abutment teeth with reduced periodontal support. J Oral Rehabil. 1975 Apr;2(2):105-16.
31. Gilmore N, Sheiham A. Overhanging dental restorations and periodontal disease. 1971