



Article

A scientific and practical algorithm of criteria for dental care, which effectively specializes in the treatment of patients with acquired immunodeficiency syndrome

Sunnatullo Gafforov *¹ , Rayxon Pulatova ¹ 

¹ Department Dentistry, children dentistry and orthodontics, Center for the Development of Professional Qualification of Medical Workers, Tashkent, 100007, Uzbekistan

gafforovsunnatullo8@gmail.com (S.G.), rayxonpulatova82@gmail.com (R.P.)

* Correspondence: gafforovsunnatullo8@gmail.com; Tel: +998 (90) 3243888 (S.G.)

Abstract: Background. Dental care for patients with acquired immunodeficiency syndrome (AIDS) is a particularly difficult and problematic situation. The formation of socially acute trauma among people with a risk of infection by clinical course, characteristics, and high incidence has already caused significant problems in the diagnosis and treatment of this disease. Over the past five years, only 49,000 people in Uzbekistan have been diagnosed with AIDS, most of them between the ages of 29 and 50, of course, in order to ensure direct interaction of dental specialists with this category of patients. This is a specialized course of dental care-modern artificial dentures laugh, improving the functional state of the periodontium, therefore, an algorithm of therapeutic and preventive measures is needed, taking into account etiopathogenetic mechanisms, in order to improve the effect of resistance to chewing pressure in dentures. The purpose of the study is to substantiate the algorithm of scientifically based criteria for the provision of specialized dental care to AIDS patients.

Materials and methods. Clinical and dental, laboratory, functional, and histomorphological studies were conducted among 258 people aged 18 to 56 years in the Republic as 384 patients (main group-M/G) and control group (C/G) who were infected in the dispensary of the Control branch of the Center "Struggle with acquired infections." Immunodeficiency syndrome" and they were blessed in the Bukhara branch of Vertex Thermo Senses.

Results. It was found that patients with AIDS have characteristic features of pathological changes occurring in the tissues and organs of the oral cavity (OC), as well as general and local etiological factors of periodontal tissue damage – defects of the teeth and dental system. An algorithm for pathologies of tissues and organs in the oral cavity was created, which accurately combines effective criteria for treatment and prevention for AIDS patients with scientific ones, and a protocol certificate for the procedure was obtained.

Conclusion. Among patients with AIDS, while eliminating inflammatory processes of periodontal tissues and dentition defects – increasing the efficiency of chewing, Vertex Thermo Sens showed the effectiveness of a therapeutic and preventive algorithm developed to restore dentition by affecting their removable dentures, made from materials "Ftorax", "Gluma Comfort Bond". The adhesive was the most advanced to date.

Keyword: dental diseases, AIDS, HIV, inflammation of periodontal tissues, dentistry, occlusion, artificial dentures, oral mucosa, saliva, gnathodynamometry.

Quoting: Sunnatullo Gafforov, Rayxon Pulatova. Uzbek Journal of Medical Science and Education. 16–28. <https://doi.org/>

Received: 10.01.2024

Corrected: 18.01.2024

Accepted: 25.02.2024

Published: 30.02.2024

Copyright: © 2025 by the authors. Submitted to for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Introduction

Secondary pathological factors formed in the body of people with acquired immunodeficiency syndrome (AIDS) negatively affect the functioning of organs and tissues; they damage the souvenir organs of the body - the heart, brain cells, liver, bone marrow, CD4-carrying markers [4,10,11]. The clinic, course, treatment, and prevention of dental diseases in these people depend on the outcome of the elimination of the main pathology, that is AIDS [1,3,7]. It is known that the quality, biological compatibility, or physical and mechanical aspects of the raw materials of artificial dental prostheses

(ADPs) used for dental treatment - including acrylate, and polymethylmethacrylate compounds - cause pathological changes in the tissues of the oral cavity, oral mucosa (OM), under the prosthesis and in the border area [2,5,6]. Another aspect is that the frequent breakage of the removable denture bases, which is observed on average up to 80%, prompts the search for new technologies to positively solve the problem, while at the moment there are no effective laboratory and materials science studies in our republic, including those devoted to studying the clinical effectiveness and safety of nylon removable dentures, which indicates the urgency of the problem [8,9,12]. In this regard, the fact that in the last five years, there have been about 49,000 people with AIDS in Uzbekistan indicates how urgent the solution to the problem is.

The purpose of the study. Algorithm justification of science-based criteria for specialized dental care in patients with AIDS.

Materials and Methods

Social, clinical, dental, laboratory and a number of special-functional examinations were conducted on 384 patients (M/G) aged 18-56 years who were under the supervision of the medical dispensary and 258 people (Con/G) who applied to the dental clinic of the Republican AIDS Center and its Bukhara regional branch during 2022-2024 using a retrospective and prospective approach [13,15,17]. The gender, age, and social status of the participants in the study are presented in (Table 4).

Table 1. Age, gender, and social characteristics of the people in the study.

Parameters	HIV-infectedn=384	Control group n=258	X ² Pirson P
men	255/66,41	175/67,83	0,65 ≥ 0,05
women	129/33,59	83/32,17	1,25 ≥ 0,05
Age 18-24	35/9,11	19/7,36	0,65 ≥ 0,05
25-34	66/17,19	44/17,05	0,31 ≥ 0,05
35-44	191/49,74	134/51,94	0,33 ≥ 0,05
45-54	61/15,89	41/15,89	0,44 ≥ 0,05
>55	31/8,07	20/7,75	0,52 ≥ 0,05
Socio-economic status			
Uneducated	104/27,08	72/27,91	0,65 ≥ 0,05
Highly educated	155/40,36	103/39,92	0,71 ≥ 0,05
Secondary education	125/32,55	83/32,17	0,45 ≥ 0,05
Unemployed	211/54,95	142/55,04	0,25 ≥ 0,05
Worker	173/45,05	116/44,96	0,41 ≥ 0,05

During the study, 134 patients with AIDS, i.e. M/G, who needed partially and fully removable dentures (PRD and FRD) and who had them before our study, were randomly selected from among M/G patients, and were newly assigned to place a denture based on indications; into 2 groups - the main group - 68 (M/G-1), including 33 patients with prosthetics made with “Vertex termo sens” and 35 with “Vertex termo sens” covered with “Gluma Comfort Bond”: the comparison group - 66 (Com/G), including - 32 patients with “Ftorax” acrylic plastic; 34 patients with prosthetic surfaces made of this material covered with the adhesive system “Gluma Comfort Bond”. To assess the vital functions of organs and tissues in the oral cavity (OC), 38 patients were selected from healthy Con/G. A total of 155 prepared PRD and FRD (including 66 “Ftorax”; and 89 “Vertex termo sens” materials) were morphologically examined on the surface of the dentures (Hitachi C 405a electron microscope and camera); intravital micro angiography of the oral mucosa tissues, as well as a luminescent photodiagnostic scope (model-178) and an immersion microscope, were used [14,18].

Clinical and dental examinations of the subjects included the hygienic index ((GI) Green-Vermillion – ONI-s, 1969), periodontal index ((PI), Russel, 1956), assessment of gingival bleeding symptoms ((Muhleman, 1971, and Cowell, 1975), periodontal tissue (PT) condition (CPITN (WHO)), assessment of soft tissue viability (micro angiography or stomatoscopy), horizontal (H/P) and vertical (V/P) pressure levels in the PT (gnathodynamometric method (Bekmetov M.V., et al., patent No. 1637782), assessment of the local immune system in saliva (J. Mancini method, 1965), pathological

defects in teeth, dental arches and jaw bones (caries prevalence, The CFE index, the need for dentures in the dentition, radiological (R) – (“Ortophos-3” – orthopantomography (OPG)), and the histomorphology of the submaxillary and maxillary sinuses were assessed. The results of the study were analyzed using Microsoft Excel and Statistica-6 computer programs [16,19].

Results and its discussion

Preliminary results of clinical and stomatological examinations among those in the study: prevalence of caries in M/G patients is 100% (Con/G- 80%); caries (C), filling (F) and extraction (E) - CFE intensity – 15.4% (Con/G-8.6%); - the ratio of CFE indicator elements – C - 60% (Con/G-38.5%); F – 9.5% (Con/G- 40%); E – 31.5% (Con/G – 21.5%).

Healthy PT M/G was not observed in humans (Con/G 15.5% ($\chi^2=12.31$; $P\leq 0.05$)), as well as severe inflammation (SI) of the PT in 63.5% (Con/G - 13, 18% ($\chi^2=21.1$; $P\leq 0.01$)), moderate inflammation (MoI) of the PT 47.29% (Con/G-21.6% ($\chi^2=17.32$; $P\leq 0.01$)), mild inflammation (MiI) of the PT was noted in 24.1% (Con/G 14.8% ($\chi^2=11.12$; $P\leq 0.05$)), CPITN-index (Fig. 1); - the intensity of occurrence; - severe bleeding gums, the predominance of tartar and plaque in terms of volume and duration, depth of periodontal pathological pockets, the severe clinical course of the inflammatory process, unusual morphological form, indifference to diagnostic tests and medications, dark-colored swelling and bright-colored desquamative gingival margins on probing it is characterized by severe bleeding.

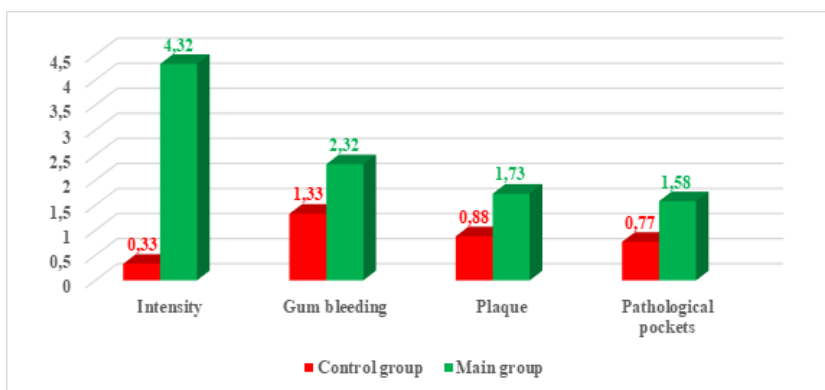


Figure 1. Clinical and functional indicators in periodontitis (CPITN index)

Among the people in the study, we can observe that oral mucosa is superior to Con/G indicators in people with AIDS in Figure 2: Candidiasis - 25% ($\chi^2=17.26$; $P\leq 0.01$); - oropharyngeal candidiasis - 14.58% ($\chi^2=12.11$; $P\leq 0.01$); angular coefficient - 18.49% ($\chi^2=14.27$; $P\leq 0.01$); herpetic stomatitis – 10.68% ($\chi^2=10.32$; $P\leq 0.01$); recurrent aphthous stomatitis – 14.32% ($\chi^2=12.31$; $P\leq 0.01$); chronic unusual sialoadenitis 17.71% ($\chi^2=14.25$; $P\leq 0.01$); hairy leukoplakia - 3.6% ($\chi^2=4.85$; $P\leq 0.01$); non-Hodgkin’s lymphoma - 2.86 ($\chi^2=7.81$; $P\leq 0.01$) and Kaposi’s sarcoma - 4.42% ($\chi^2=4.21$; $P\leq 0.05$).

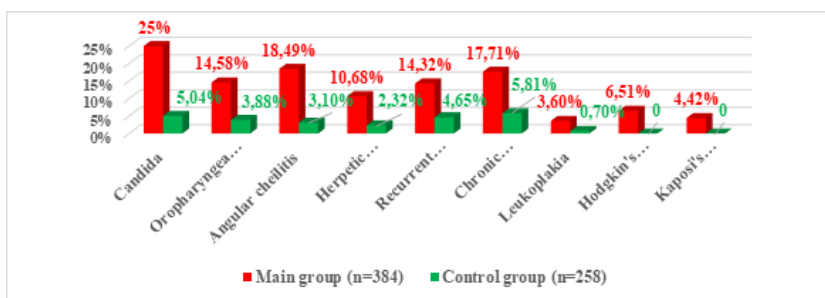


Figure 2. Description of the pathologies of oral mucosa in humans in the study.

Gnatodynamometric studies of 134 patients selected from M/G-1, including M/G-2 – 68, Com/G – 66, and Con/G-1 38 healthy individuals – vertical pressure (V/P) and horizontal pressure (H/P) -

up to 2-4 times higher than Con/G-1 people compared to M/G-2 and Com/G-1 negative results were recorded (Fig. 3-4).

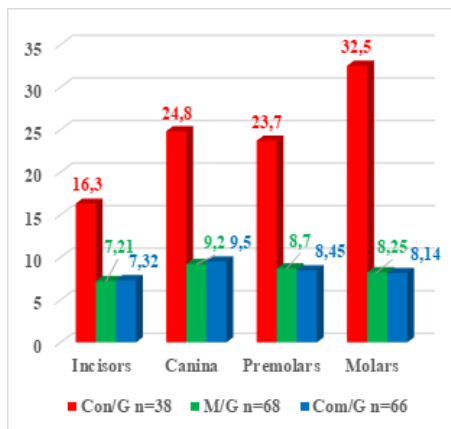


Figure 3. Vertical pressure.

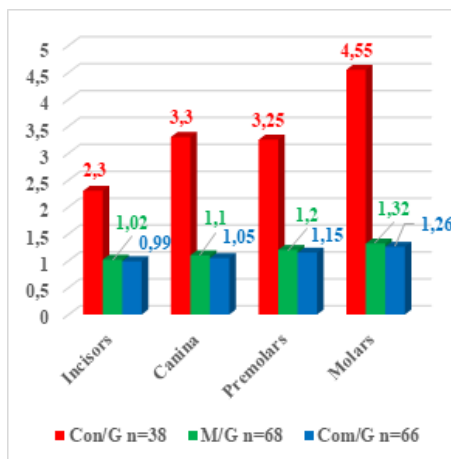


Figure 4. Horizontal pressure

During the study, the orthopedic status of patients in M/G-1 was assessed: - need for dentures; - 14.12% non-removable (Con/G-55.3%); - 76.12% of patients had PRD (Con/G-33.7%); - 23.8% had FRD (Con/G-11.3%); in M/G - 26.5% of 49 patients had PRD (Con/G-27.27%); - 16.3% had FRD (Con/G- not observed); - 57.16% (Con/G-72.7%) had a prosthesis (Table 2).

Table 2. Orthopedic Status of Patients with AIDS: Use and Need for Dentures (Mean ± Standard Error, %)

Category	Full Removable Dentures (FRD)	Partial Removable Dentures (PRD)	Bridge Crown	Total Patients	Statistical Analysis
	Absolute Number	M±m (%)	Absolute Number	M±m (%)	Absolute Number
Users	8	16.3 ± 0	13	26.5 ± 0	28
Need	32	23.8 ± 4.98	102	76.12 ± 7.54	19
Statistical Significance	-	-	-	-	-

The results of stomatoscopic examination of the tissues under the existing prosthesis and border of the periodontal ligament of patients with M/G were characterized by keratinization foci, persistent wound changes, vascular patterns in the transition of periodontal tissue to the soft palate, small networks, changes in transparent venous vessels in a pale yellow form, bright red hyperplasia, necrotic foci in the areas of acute injury, and complications of chronic bleeding in the periodontal area.

The morphology of the oral mucosa tissue under and at the border of the prosthesis in patients with dentures made from "Ftorax" material - in the mucous membrane - a thin stratum corneum, 4-5 rows of cells and thinning of the epithelium on the surface, thickening of the stratum corneum, a small number of keratohyalin and poorly expressed granular layers, a spinous layer, karyopycnosis and acantholysis in the cells, and the presence of hypochromic nuclei in the cells were noted. The basal layer, located on the basement membrane with wavy borders, is represented by cylindrical cells, and mitotic figures are often found. The connective tissue is divided into deep layers. A significant lymphohistiocytic infiltration was detected in the connective tissue (Fig. 5).

At a magnification of 400 times in SEM, the microrelief of the contact surface of the FRD and PRD made from "Ftoraks" raw material with the oral mucosa can be observed; chaotic, incompletely cured small gaps and traumatic sharp edges, as well as contamination of the prosthesis surface with residues due to the design (Fig. 6).

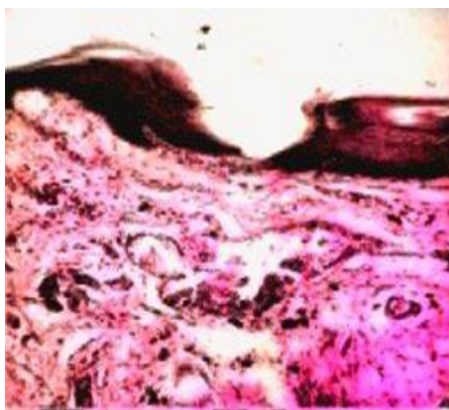


Figure 5. Morphology of oral mucosa wearing removable dentures from "FTORAKS" material. Hematoxylin and eosin. 100x magnification in SEM.



Figure 6. Morphology of the contact surface of removable dentures oral mucosa with "Ftorax" material. 400x magnification in SEM.

X-ray images showed destruction of cortical plates of U/J and L/J bone, osteoporosis, negative changes in alveolar bones, the combination of horizontal and vertical atrophy, large bone pockets, destruction of alveolar tumors, irregular foci of dystrophic changes in tissues and disappearance of periodontal structures.

Local immunological parameters in the saliva of M/G-1 and Con/G-1 individuals in the study group: sIgA titers M/G-2 and Com/G-1 ($1.24 \pm 0.08^{***}$ and $1.42 \pm 0.08^{***}$, respectively) 0.2^{**}) and lysozyme indices ($11.2 \pm 0.5^{**}$ and $10.6 \pm 0.8^{**}$, respectively), Com/G inconsistencies (2.15 ± 0.7 and 18.4 ± 0.9 respectively) M/G-2 and Com/G-1 confirm the decrease in the activity of the local immune system.

The scientific and practical criteria of the above results were obtained during our study; in order to eliminate the complications of the interrelationship in the course of the general and local etiopathogenetic mechanism in the human body in AIDS We have planned the following “Specialized treatment and prevention algorithm for patients with AIDS”.

In the next stage of the study, patients with AIDS received regular and planned enhanced antiviral therapy (AVT) by profile specialists based on international standards and protocols, and local treatment was applied as a dentist: Com/G-1, 66 patients with moderate forms of periodontitis (MFP) by traditional methods, M/G-2 - 68 patients with improvement of hygienic condition, elimination of necrotic deposits, curettage, elimination of traumatic occlusion and immobilization, cleansing of necrotic tissues and dressing with “Metrogil Denta” ointment (treatment with 0.025% chlorhexidine and 0.3% trypsin solution), and after the acute inflammation was eliminated, “Sextophage” solution was applied under the protective-fixing dressing. Additionally, 100 mg of “Fluconazole” was administered for 14 days, and for those with OBSC pathologies, 400 mg of “Acyclovir” 3 times a day, and for hairy leukoplakia - 0.1% oil solution of vitamin A.

For orthopedic dental treatment, all patients were prepared for oral cavity prosthetics, and the above-mentioned 134 patients (M/G-1); including 68 patients from M/G-2 and 66 from Com/G, and 38 patients from Con/G, were placed in removable dentures. To eliminate the defect of the dentition, 33 patients in M/G-2a (thermoplastic “Vertex termo sens” raw material), 35 patients in M/G-2b (Vertex termo sens removable dentures was replaced with “Gluma Comfort Bond”); in Com/G - 66 patients, including - in Com/G-1 - 32 patients (“Ftorax” acrylic plastic), in Com/G-2 - 34 patients (“Ftorax” dentures surface covered with “Gluma Comfort Bond”) were placed with “Ftorax” prostheses. In 38 patients selected from Con/G, removable dentures made on the basis of high-tech thermoplastic “Vertex termo sens” raw materials were placed, and the results obtained by repeating the above studies were analyzed.

In the studies, when initially preparing PRD and FRD from the “Ftorax” material and impregnating their surfaces with Gluma Comfort Bond, the quality of the dentures surface design (Fig. 7, 9) and microrelief (Fig. 8, 10) improved: the adhesive filled the pores of the inner surface of the prosthesis, isolated the ingredients, and due to its smoothness, the environment for the accumulation of food debris and microorganisms disappeared. Patients emphasized the ease of use of dentures, the absence of sharp edges, functional convenience, and high chewing efficiency. Due to the smoothness of dentures, the patients’ adaptation period to the prosthesis was shortened, and it was predicted that it would lead to a positive change in functional chewing and hygienic condition of the oral cavity.

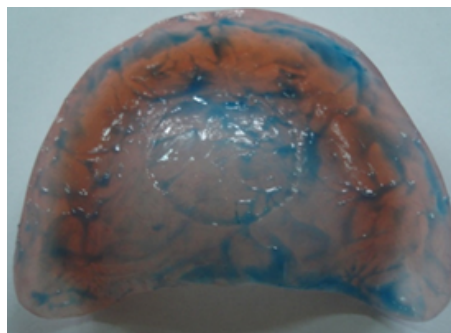


Figure 7. The inner surface of the removable dentures is made of “Ftorax” material after treatment with orthophosphoric acid.

The FRD and PRD made from the “Vertex termo sens” material (Fig. 11 for the lower jaw and Fig. 12 for the upper jaw) showed superiority over the “Ftorax” material removable dentures in terms of clinical and morphological aspects, biological compatibility, and design. This denture showed its superiority to patients, especially in terms of its durability, functionality, and the absence of an adaptation period. It is characterized by the fact that it does not injure the oral mucosa and that food residues and residual cells in the composition of mixed saliva do not adhere to the prosthesis.



Figure 8. The relief of the prosthesis surface after bonding with "Gluma Comfort Bond" in SEM at a magnification of 200 times.



Figure 9. The surface of adhesively coated "Ftorax" removable dentures and

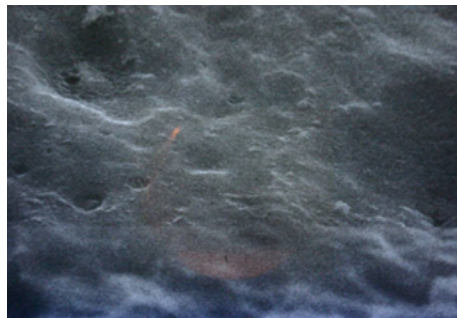


Figure 10. 400x SEM relief.



Figure 11. For the lower jaw,



Figure 12. is removable dentures made from "Vertex thermo sens" material for the upper jaw.

When the surface of the dentures made from "Vertex termo sens" raw material is magnified 400 times in SEM (Fig. 13), we can see that the contact surface of the prosthesis with the oral mucosa is more precisely smooth, there is almost no environment for microorganisms to live, a protective barrier is created to prevent the release of chemical ingredients from the prosthetic raw material into the oral mucosa, and the risk of damage is eliminated.

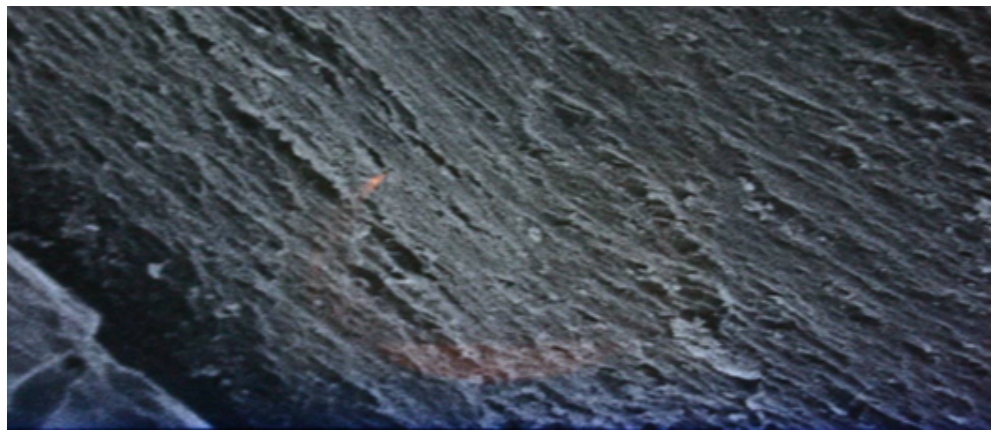


Figure 13. Relief of the surface of the dentures made from "Vertex thermo sens" raw material, taken in SEM at a magnification of 400 times.

The surface of the prosthetic devices made from the "Vertex termo sens" and "Ftorax" raw materials was covered with the "Gluma Comfort Bond" adhesive and after 1 and 6 months from the moment of delivery to the patient, the prosthesis surface remained smooth, transparent, hygienically clean, and maintained its biomechanical, biophysical, clinical-functional, and morphological characteristics.

Among patients with AIDS, after the placement of FRD and PRD, effective clinical results were observed, slightly better than Com/G-1 ("Ftorax") than Com/G-2 ("Ftorax") prosthetic devices, while the superiority of the "Vertex termo sens" thermoplastic raw material was maintained. In patients M/G-2a and M/G-2b, the PI index was 0.87 and 0.18 compared to Com/G-2; the results of treatment and prevention work, after 6 months, GI M/G-2a - 0.92, M/G-2b -0.88; Com/G-1 - 0.84, Com/G-2 0.86 ($n<0.01$; $n<0.05$): CPTIN-index - 1.82; - 1.84; -1.02; -1.22, a positive change was observed from the indicators before prosthetics from 0.04 to 0.18 ($n=0.01$; $n<0.05$). As a result of the simultaneous elimination of defects in the tooth rows, the carious lesions of the dental hard tissue and row defects were also effectively treated: after 6 months, M/G-1 CFE-index - "C" - 24%, "F" - 44%, "E" - 32%; 26% in Com/G; 46%; a positive change was observed in 28% compliance (Table 3).

Keratinization in the oral mucosa was reduced, the relief of soft tissues was significantly restored, hyperemia was reduced, the number of lesions and dry mouth was reduced, and plaque on the tongue disappeared or was significantly reduced. The gingival area of the gingival region was reddened, venous stasis phenomena were reduced, and a positive result was observed in the appearance of blood vessels. In the R-image, stabilization of bone tissue was noted - significant positive changes in the state of the U/J and L/J - in some cases, bone densification was observed. Analysis of the

Table 3. Indicators of clinical and functional condition of the oral cavity after 6 months of treatment.

Group	Good 4 points	A noticeable improvement 3 points	Imperceptible improvement 2 points	Without change 1 point
Con/G n=38	22/58	14/36,8	2/5,2	-/-
M/G-2 n=33	7/21,2	17/51,5	9/27,3	-/-
M/G-2b n=35	9/25,7	20/57,1	6/17,1	-/-
Com/G-1 n=32	4/12,5	10/31,2	14/43,7	4/12,5
Com/G-2 n=34	6/17,6	16/47,1	12/35,3	-/-

Note: in the picture - the number of patients with the appropriate score; in the denominator is the percentage of the number of patients in the group

gnathodynamometric parameters of various methods of orthopedic treatment showed that the increase in the tolerance of all groups of teeth Com/G compared to their values before treatment was less than the increase in M/G, but positive results were observed (Table 4).

Table 4. Gnathodynamometric measurements after treatment and prophylaxis in patients with M/G-1 in the study.

Group	Time Point	Tooth Type	Vertical Pressure (N)	Horizontal Pressure (N)
Intact periodontium	-	Incisors	16.3 ± 0.64	2.3 ± 0.12
		Canines	24.8 ± 0.76	3.3 ± 0.13
		Premolars	23.7 ± 0.78	3.25 ± 0.12
		Molars	32.5 ± 1.33	4.55 ± 0.11
Main group	Before treatment	Incisors	7.32 ± 0.13*	0.99 ± 0.04*
		Canines	9.5 ± 0.12*	1.05 ± 0.04*
		Premolars	8.45 ± 0.13*	1.15 ± 0.04*
		Molars	8.14 ± 0.19*	1.26 ± 0.05*
	After treatment	Incisors	11.28 ± 0.06*Δ	1.53 ± 0.01*Δ
		Canines	12.5 ± 0.08*Δ	1.42 ± 0.01*Δ
		Premolars	12.66 ± 0.08*Δ	1.53 ± 0.05*Δ
		Molars	11.59 ± 0.11*Δ	1.92 ± 0.05*Δ
	After 6 months	Incisors	10.08 ± 0.03*Δ	1.25 ± 0.03*
		Canines	11.3 ± 0.05*Δ	1.25 ± 0.03*
		Premolars	10.45 ± 0.04*Δ	1.35 ± 0.04*
		Molars	11.33 ± 0.15*Δ	1.46 ± 0.05*
Comparison group	Before treatment	Incisors	7.21 ± 0.2*	1.1 ± 0.03*
		Canines	9.2 ± 0.16*	1.1 ± 0.03*
		Premolars	8.7 ± 0.14*	1.2 ± 0.05*
		Molars	8.25 ± 0.19*	1.32 ± 0.05*
	After treatment	Incisors	9.25 ± 0.03**	1.38 ± 0.03**
		Canines	11.12 ± 0.32**	1.38 ± 0.03**
		Premolars	11.71 ± 0.04**	1.4 ± 0.05**
		Molars	10.05 ± 0.06**	1.55 ± 0.06**
	After 6 months	Incisors	8.15 ± 0.03**	1.24 ± 0.03**
		Canines	10.02 ± 0.12**	1.24 ± 0.03**
		Premolars	10.41 ± 0.05**	1.32 ± 0.05**
		Molars	9.15 ± 0.05**	1.4 ± 0.06**

Note: * - significant differences were noted when compared with the group of healthy individuals (*** - $P < 0.05$; ** - $P < 0.01$; * - $P < 0.001$);

χ - significant differences were noted when compared with the results before treatment ($\chi\chi\chi - P < 0.05$; $\chi\chi - P < 0.01$; $\chi - P < 0.001$);

Δ-1 - significant differences were noted when compared with the state after HIV treatment in the group ($\Delta\Delta\Delta - P < 0.05$; $\Delta\Delta - P < 0.01$; $\Delta - P < 0.001$).

The results of local immunological testing showed that salivary sIgA increased from 1.24 g/l to 2.05 g/l; Com/G - from 1.42 g/l to 1.68; lysozyme titer increased from 11.2 g/l to 16.7 g/l; Com/G - from 10.6 mg/% to 13.8 mg/%, showing positive results. The results confirm the improvement of the composition of the oral cavity and local immunological indicators due to the proposed dentures shelling after the recommended treatment of the dysbiotic state of the oral cavity caused by dentures (Fig. 14).

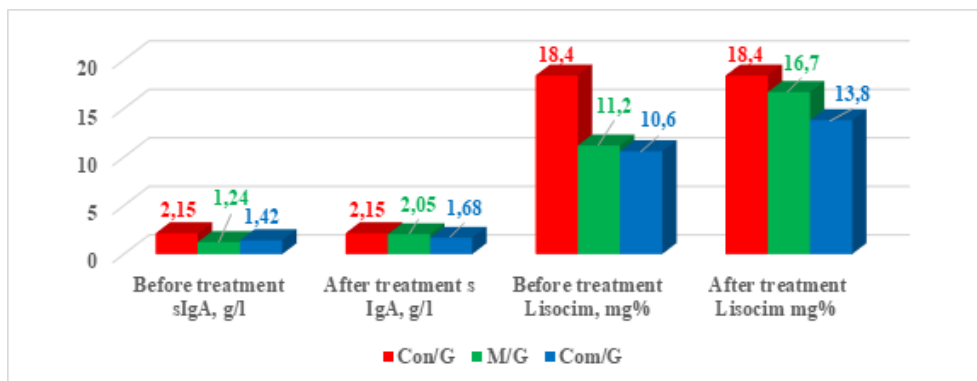


Figure 14. Characterization of the local immune system as a result of complex treatment in humans

Patients of the study group M/G-1, who underwent dentures for 6 months, in particular, the prosthesis made of “Vertex termo sens” material (Fig. 15), and the mucosal tissues were cut into 4-5 microns thick and examined for morphology, showing clear positive changes: - the basement membrane is relatively thin, smooth, partially wrinkled, with a weak sign of keratinization, thickening due to the presence of keratohyalin grains, in the stage of replacement with a thick stratified epithelium with horny and clearly granular layers, and 2-3 rows of squamous cells are observed.

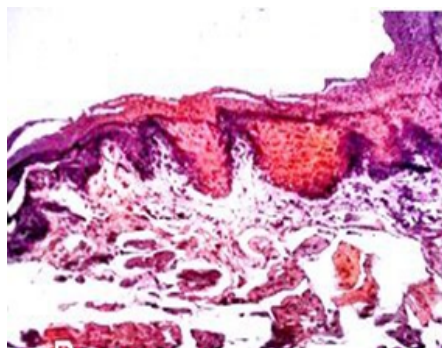


Figure 15. The submucosal area of the prosthesis is made of “Vertex thermo sens” material

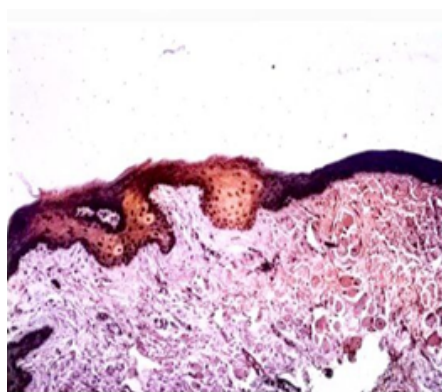


Figure 16. Submucosal area of the STP made of “Ftoraks” material. Hematoxylin and eosin. Magnified 100 times

The removable dentures area was covered with “Gluma Comfort Bond” of “Ftorax” material (Fig.16) Histomorphological results of the oral mucosa tissues; the epithelium was thinned and had a thinned stratum corneum over a relatively large area, positive changes were observed in the basement membrane, stromal edema decreased, the number of mast cells decreased, and the number of salivary glands increased. In patients with M/G-1, fewer changes in the morphology of the oral mucosa were observed compared to those in M/G-2.

Conclusion

For patients with AIDS, pathological changes in the tissues and organs of the oral cavity, unusual clinical features, the frequency of occurrence and the peculiarity of the course, the presence of a large number of defects in the dentition, a high need for dental orthopedic care - partially removable dentures (76.04% versus 22.41% (n/g) ($\chi^2=7.11$; $P\leq 0.05$)), completely removable dentures (23.95% versus 3.87% (n/g) ($\chi^2=8.25$; $P\leq 0.05$)) lead to a high need.

In functional studies, the tolerance of patients with AIDS to chewing pressure loads is negative - in PT, the tolerance to moderate H/P (>29.63) and V/P (>28.76) is 2-4 times (Con/G) (relatively) decrease, negative changes in PT indices and negative morphological changes in the tissues of the contact surface of the prosthesis and the border of the mucosa with oral cavity are reflected, as well as the indicators of local immunity in the composition of saliva.

In the tissues of the mucosa of the prosthesis and the border of the removable dentures in the mouth of patients with AIDS, thickening of the border-horny layer, 8-9 cell alignment, indeterminate border of the thorny layer, and the appearance of numerous acantholytic cells, dystrophy of the cortical plate of the scapular and scapular bone, osteoporosis and atrophy of the alveolar bones are strongly manifested.

The effectiveness of the scientific and practical criteria of the "Specialized treatment and prevention algorithm for patients with AIDS" proposed and developed for patients with AIDS - was reflected in the improvement of the quality of life of patients, including the improvement of the functional state of the organs and tissues of the oral cavity by impregnating the artificial dentures and the PRD made of the "Vertex Thermo Sens" raw material, as well as traditional dentures - "Ftorax" with the "Gluma Comfort Bond" adhesive, omitting the finishing and polishing stages, and protecting the denture surface from monomers by sealing the pores.

The design and used raw materials of FRD and PRD proposed in the “Specialized treatment and prevention algorithm for patients with AIDS” - increase the effectiveness of treatment and prevention measures by restoring the local immune system, improving local immunity in the oral cavity (sIgA (42.11% ($p<0.01$)), lysozyme (27.13% ($p<0.05$)), eliminate pathological processes, improve hygienic index indicators and the state of the oral cavity (periodontal index PI - decreases by 40% ($p<0.01$)); OHI-S index - 53% ($p<0.01$); bleeding from the gums - 36.45% ($p<0.01$); improve gnathodynamometric indicators (54.4%, $p<0.01$), in the oral mucosa cells was reflected in the alternation of the histomorphological environment.

Authors' contribution.

S.A.Gafforov – Conceptualization, software, formal analysis, resources, writing—original draft preparation, visualization, project administration,

R.S.Pulatova – methodology, validation, investigation, data curation, writing—review and editing, supervision, funding acquisition.

Funding source.

This research received no external funding.

Ethics approval.

Not applicable.

Consent for publication.

Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patients to publish this paper.

Data Availability Statement

The data presented in this study are available upon request from the corresponding author.

Acknowledgments In this section, you can acknowledge any support given that is not covered by the author's contribution or funding sections. This may include administrative and technical support, or donations in kind (e.g., materials used for experiments).

Conflict of interest

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Abbreviations

PT	periodontal tissue
FRD	fully removable dentures
PRD	partially removable dentures
AIDS	acquired immunodeficiency syndrome

References

1. Alimov A.S., Gafarov S.A. Alimov A.A., Optimization of orthopedic dental therapy in HIV-infected patients, taking into account the periodontal condition. Collection of works on mater. inter-scientific-practical. the conference room. "Medical science in the era of digital transformation"/12/10/2021. DOI 10.21626.
2. Astanov O.M., Gafarov S.A. Tishka to riva chanov uzasi nuksonlari asoratidan shakllangan chaka Easter jacques bukhimi faoliyatidagi ogrikli sindromlarni tashis kuyishni mukammallashtirish. Method. Recom. Approved. Ministry of Health Uz. 10/23/2021 Protocol No. 968. Tashkent 2021
3. Belyakova S., Bazikyan E.A., Pchelin I. V. 2018. Substantiation of a study on optimizing the system of surgical dental care for patients with HIV infection. An analytical Review of the Literature', Journal of Infectology, 10, 3(3), doi:10.22625/2072-6732-2018-10-3-45-53.
4. Gaffarov S.A., Pulatova R.S. 2023. Kliniko-funktionalnaya otsenka sostoyaniya tverdex tkaney Zubov I slizistoy obolochki polosti RTA vich-infisirovannix bolnix. Journal of Medicine of Uzbekistan. 2: 20-31.
5. Gaffarov S.A., Bulatova R.S. Comparative assessment of the condition of tissues and organs of the oral cavity of HIV-infected patients. Mathematical Statistics and Public Law Policy, Volume 2, Is 2 (4), 65-73. <https://doi.org/10.57231/j.idmfs.2023.2.2.009>
6. Dzhumaev Z.F., Kayumov G. O., Gafarov S.A., Khan D.N., Tozhiev F.I. Restoration of defects in the maxillofacial region after oncological operations. Journal of Medicine and Innovation. 2023, (12): 104-127.
7. Nazarov U.K., Gaffarov S.A. Biriktiruvchi tukima dysplasia cakka-pastki zhag bugimi va tish katori shakllanishidagi nuksonlarni bashoratlashda zamonaviy tekshirish usullarini kulashning ahamiyati. Method. Recom. Approved. Ministry of Health of Uzbekistan. 01/16/2023 Protocol No. 8h-r/88. Tashkent 2023.
8. Shen P.A., Helminskaya N.M., Goncharova A.V., Kravets V.I. 'Assessment of risk factors for the spread of HIV infection at a dental appointment is the topic of a scientific article on clinical medicine. Read the text of the research paper for free in the CyberLeninka electronic library.' Accessed: Oct. 15, 2024
9. Aitken-Saavedra J. P., da Silva Barboza A., Ferreira M. L., Fábio Aranha A. M., and Lund R. G. 2021. Are propolis extracts potential pharmacological agents in human oral health? - A scoping review and technology prospecting', J. Ethnopharmacol., vol. 271, p. 113846, doi: 10.1016/j.jep.2021.113846.
10. Gaffarov S.A., Pulatova R.S. omparative estimates of the morphological structure of the surface of removable dentures made of different materials for the replacement of dentition defects. Science and innovation international scientific journal, 2023, 2(12): 918-924 <https://doi.org/10.5281/zenodo.10405778>
11. Gaffarov S.A., Pulatova R.S. Clinical and laboratory studies of basic materials «ftorax» and «vertex termosens» used in dental prosthetics of HIV-infected patients. //Practice Oriented Science: UAE – RUSSIA – INDIA Materials of International University Scientific Forum August 25, 2023. 131-140. DOI 10.34660/INF.2023.80.56.059.
12. Ubaydullayev K.A., Gafur-Akhunov M.A., Gaffarov S.A. Metod of Rehabilitation Treatment and Ortopedic Prosthetics of Oncological Patients with Postoperative Defects in Maxillofacial Area. American Journal of Medicine and Medical Sciences, 11(2): 95-98. DOI. 20211102.05.
13. Glick M. and Williams D. M. 2021. FDI Vision 2030: Delivering Optimal Oral Health for All', Int. Dent. J., vol. 71, no. 1, pp. 3–4, doi: 10.1016/j.identj.2020.12.026
14. Jain P. et al. 2015. Outcomes of patients with chronic lymphocytic leukemia after discontinuing ibrutinib', Blood, vol. 125, no. 13, pp. 2062–2067, doi: 10.1182/blood-2014-09-603670
15. Lomeli-Martínez S.M. 'Oral Manifestations Associated with HIV/AIDS Patients'. Accessed: Oct. 15, 2024. [Online]. Available: <https://www.mdpi.com/1648-9144/58/9/1214>
16. Mustafaeva D.A., Pulatova R.S. 2024. Methods of Testing the Condition of the Oral Cavity in Patients with Hiv Infection // Research journal of trauma and disability studies. 3(1). 83-86

17. Nikou S.A. et al. 2019. Candida albicans Interactions with Mucosal Surfaces during Health and Disease', Pathogens, 8, 2(2), doi: 10.3390/pathogens8020053
18. Nurmatova N.T., Pulatova R.S. Gafforov S.A. 2023. Clinical Evaluation of the Effectiveness of Thermoplastic Materials Used in the Dental Prosthetics of HIV-Infected Patients. Journal of Chemical Health Risks, 13(4). 484-495
19. Pekiner F. N. Keser G., Yilmaz G. 2021. 'Assessment of Knowledge Level and Awareness About Human Papillomavirus Among Dental Students', J. Cancer Educ., 36(4), 664–669, doi: 10.1007/s13187-019-01683-3.

Disclaimer of liability/Publisher's Note: The statements, opinions and data contained in all publications belong exclusively to individuals. The authors and participants, and the Magazine and the editors. The magazine and the editors are not responsible for any damage caused to people or property resulting from any ideas, methods, instructions or products mentioned in the content.