DENTAL CONDITION AFTER BARIATRIC OPERATIONS.

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ANNOTATION

Bariatric surgery in recent years remains one of the most common surgical interventions in the world for obesity. The number of operations performed per year has decreased significantly compared to 10 years ago

The purpose of the study. Features of dental health after bariatric surgery.

Material and research methods. The data of medical records and the results of additional studies were studied in relation to 102 patients with an average age of 37.6 ± 10.0 years, who were assisted at the hospital in private dental clinics in the cities of Samarkand and Tashkent. Based on the purpose of the work, the study was conducted in the following 2 groups: G1 - an experimental group with 52 patients who underwent Roux-en-Y gastric bypass surgery (RYGB), and G2 - a control group with 50 patients with severe obesity selected for bariatric surgery.

The results obtained: 52 operated patients and 50 obese patients were examined. Significant differences between the experimental group (13 men and 39 women) and the control group (14 men and 36 women) by gender and mean age G1-39.6±9.6 years and G2-35.55±10.2 years, respectively. The period between surgery and examination was 16.9±20.7 months .

Conclusion. Bariatric patients had a prevalence of oral disease similar to that of obese patients, however, periodontal pocket conditions were more prevalent in bariatric patients. Maintaining a healthy periodontal condition can be considered a good strategy for patients with morbid obesity and bariatrics .

Relevance. In recent years, bariatric surgery remains one of the most common surgical interventions in the world for obesity. The number of operations performed per year has decreased significantly compared to 10 years ago [24]. Obesity is one of the serious and most common chronic diseases. In recent years, every fourth person suffers from obesity or is overweight [11,12,16]. According to

epidemiologists, a further increase in the number of people suffering from obesity is expected.

There is a close connection between obesity and the development of inflammation in the body, which is manifested in the interaction of blood plasma and C-reactive protein [20]. And thus obesity can be considered one of the most pressing problems of modern medicine.

Of interest to dentists is data on the impact of bariatric surgery on oral health in patients with morbid obesity. In the Marsiscano longitudinal study et al . found no significant differences in saliva volume, caries prevalence, or tooth wear between obese patients and bariatric surgery patients [6]. High the level of excess weight and the associated severalfold increase in bariatric surgery, the number of dental patients with bariatric surgery is also increasing. The frequency of visits to dental offices increases in patients undergoing bariatric surgery [4].

Purpose of the study. Features of dental health after bariatric surgery.

Material and research methods. Data from medical records and the results of additional studies were studied for 102 patients with an average age of 37.6 ± 10.0 years who received inpatient care in private dental clinics in the cities of Samarkand and Tashkent. Based on the purpose of the work, the study was conducted in the following 2 groups: G1 - experimental group with 52 patients who underwent Roux-en-Y gastric bypass (RYGB) surgery, and G2 - control group with 50 severely obese patients selected for bariatric surgery.

These patients were nonsmokers, and only four patients had undergone periodontal treatment; however, periodontal treatment had been performed 2 years prior to this study.

Stimulated saliva was collected after patients chewed paraffin wax for 5 minutes and spit the saliva into a small cup, after which it was measured with a syringe. Salivation was classified as normal (>1.0 ml/min) or hyposalivation (<1.0 ml/min).

Clinical examinations to monitor the average number of decayed, missing or filled teeth (DMFT index) and periodontal status (CPI index) were assessed according to World Health Organization criteria [23].

The tooth wear index was obtained by modifying the TWI (tooth wear index) described by Sales-Peres et al [3].

criteria were: (0 - normal: no signs of wear; 1-Initial stage: wear of tooth enamel; 2-Moderate: wear of tooth in dentin; 3- Severe: wear of tooth in pulp or secondary dentin; and 4- Restored: wear of tooth , leading to restoration; 9-Not evaluated.

Clinical examinations were performed by a pre-certified dentist.

Both descriptive and analytical approaches to data analysis were used. Data were analyzed on a personal computer using Statistica Version . Data were analyzed using Student's t test, Mann-Whitney test, Spearman correlation , and chi-square test ($\chi 2$) to confirm the association of salivation with tooth wear , periodontal disease, and bariatric surgery. The significance level was $P<0.05$.

Research results. 52 operated patients and 50 obese patients were examined. There were no significant differences between the experimental group (13 men and 39 women) and the control group (14 men and 36 women) by gender and mean age G1-39.6±9.6 years and G2-35.55±10.2 years, respectively . The period between surgery and examination was 16.9±20.7 months. There was no statistically significant difference between the two groups for median stimulated salivary flow of 0.65±0.47 ml/min (G1-0.64±0.47 ml/min and G2-0.66±0.49 ml/min; $P >0.05$). Most patients experienced hyposalivation .

Table 1.

Tooth Wear Index (DWI)

	Incisors		Fangs		Premolars		Molars	
Degree	GI P(%)	GII P(%)	GI P(%)	GII P(%)	GI P(%)	GII P(%)	GI P(%)	GII P(%)
0	15(3.6)	17(4.3)	5(2.4)	6(3.0)	9(2.2)	10(2.5)	13(2.1)	32(5.4)
1	123(29.6)	179(44.8)	81(38.9)	79(39.	269	244	304 (48.7)	273

				5)	(64.7)	(61.0)		(45.5)
2	224 (53.8)	150(37.5)	105(50.5)	88(44.0)	36(8.6)	59(14.8)	15(2.4)	26(4.3)
3	4(1.0)	4(1.0)	0 (0.0)	0 (0.0)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
4	0 (0.0)	0 (0.0)	2(1.0)	0 (0.0)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
9	50(12.0)	50(12.5)	15(7.2)	27(13.5)	102(24.5)	87(21.7)	292 (46.8)	269 (44.8)

The average DMFT index for both groups of patients was 16.08±5.72. After bariatric surgery it was 16.11±5.19 and in obese patients 16.06±6.29 (Tables 1 and 2). There were no statistically significant differences in DMFT index (P=0.96).

There was no correlation between salivary flow and DMFT index (r = 0.06, P = 0.58). The average CPI was 2.86±1.08 (G1-3.05±0.84 and G2-2.66±1.25). It has been shown that periodontal diseases are present in 73.1% of sextants in surgical patients and in 48.1% of obese patients.

Table 2.

Univariate analysis of patients undergoing or undergoing bariatric surgery

Factors		Groups		Univariate analysis		
		bariatric	Fat	Odds ratio	95% CI	P-value
Flow of saliva	Normal	13	12	0.95	0.38-2.34	0.910
	Hyposalivation	39	38			
Active dental caries	No	15	18	1.39	0.60-3.19	0.575
	Yes	37	32			
Dental clothing	Enamel	eleven	12	1.18	0.45-3.10	0.920
	Dentine	40	38			
Tooth wear - front teeth	Enamel	eleven	12	1.15	0.45-2.91	0.957
	Dentine	40	38			
Tooth wear - back teeth	Enamel	thirty	24	0.70	0.32-1.54	0.498

	Dentine	22	25			
Periodontal diseases	No	1	5	5.67	0.64-50.34	0.189
	Yes	51	45			
Periodontal pocket	No	6	15	3.29	1.16-9.33	0.039*
	Yes	46	35			

The prevalence of periodontal pockets was 88.45% in G1 and 70.00% in G2 (P=0.02) flow and CPI (r=-0.1, P=0.34) (Table 2). Regarding oral hygiene, 66% of patients brushed their teeth 2-3 times a day, 17% brushed their teeth more than three times a day, and only 13% brushed their teeth only once a day. No correlation was found between the decrease in salivation.

All patients (control group and surgical group patients) had some degree of tooth wear (Tables 1 and 2). There was no statistically significant difference between groups for DWI (P = 0.82), salivation, and tooth wear (r = 0.04, P = 0.70).

Univariate analysis showed that only the presence of periodontal pockets was significantly associated with patients undergoing bariatric surgery (OR=3.29; P<0.039) (Table 2).

Discussion of the research results. Dietary factors are associated with systemic and oral diseases, including overweight and obesity, hypertension, type 2 diabetes, cardiovascular disease, osteoporosis, dental caries, gastrointestinal disorders, and most cancers, including oral cancer [19]. Often less aggressive treatments do not provide satisfactory results for diseases caused by poor diet, such as morbid obesity, for which bariatric surgery is most effective. The growing number of bariatric procedures has increased the need to fully understand their side effects. Bariatric surgery results in a number of anatomical and physiological changes. This study evaluated RYGB surgery, which is a restrictive and deabsorbent bariatric surgery; however, the restrictive component has greater clinical significance. Elimination of the duodenum and segment of the jejunum in addition to adequate food intake may cause deficiencies in iron, folic acid, vitamin

B12, A, D, E and K. Nausea and vomiting commonly occur after bariatric surgery. In most cases, these complications can be caused by poor eating habits such as overeating, eating too quickly, or poor chewing of food . [21]. The oral health of obese patients may change after bariatric surgery because the procedure may have side effects that may cause oral changes. Relationship between dental aspects and side effects of bariatric surgery surgery has not been adequately described in the medical literature because few studies have been conducted.

The risk of tooth decay increases with high frequency of sugar consumption, especially when sugar is retained in the mouth for a long period of time. The effect of sugar or other carbohydrates on dental caries can be reduced by fluoride supplementation and good oral hygiene, but the main approach should be to reduce sugar intake as this has many health benefits [19].

In this study, the DMFT index was similar in both groups and although the caries index was low compared to an epidemiological study conducted by the Brazilian Ministry of Health [8].

One study reported that differences in eating/drinking patterns were observed after bariatric surgery. The main difference included 5 meals/snacks per day versus 3 main meals [5]. This situation increases the patient's risk of developing caries and periodontal disease, especially if xerostomia is present.

The results of this study differ from those obtained by Hague et al . [13], who observed a patient who experienced an increase in caries activity and a decrease in salivation after bariatric surgery (Table 2).

Although patients undergoing bariatric surgery may be considered at high risk for developing dental caries, since feeding frequency and type of food may be associated with the formation of bacterial plaque, which has been shown to be a major etiological agent of dental caries and periodontal disease [3].

Several recent studies have shown that periodontitis occurs more often in obese people than in people with normal body weight [1, 7].

According to [2], people with excess body weight had more severe periodontal disease when assessed by plaque, bleeding on probing and pocket depth.

In this study, there was no difference between the surgical group and the obese group in terms of CPI, but there was a significant difference in pocket depth ($P<0.05$) (Table 2). The difference between the two groups regarding alveolar bone loss may be due to vitamin or mineral deficiencies, such as hypocalcemia , after bariatric surgery [21].

Research has confirmed that bone mass may be reduced after bariatric surgery, even when calcium and vitamin D supplements are prescribed, and bone loss often occurs due to metabolic bone diseases (osteomalacia and osteoporosis) [9] and may be a cofactor for alveolar bone loss . Thus, osteoporosis may be a possible risk factor for periodontal disease.

Any acid with a pH below the critical pH of tooth enamel (5.5) can dissolve hydroxyapatite crystals in the enamel. Gastric reflux may have a pH below 2.0, and thus the likelihood of tooth erosion increases when unstimulated salivary flow is low [14].

Vomiting and other gastric upsets are important risk factors for tooth wear. Although vomiting, which is common in bariatric patients, may be considered a risk factor for tooth wear. The tooth wear index was similar for both groups (Tables 1 and 2). Heling et al . [14] confirmed that 37% of 113 patients reported increased dental hypersensitivity after bariatric surgery. Wear and tear on teeth can expose the dentinal tubules, which can cause dental hypersensitivity.

Obesity has been associated with decreased stimulated whole salivary flow rate and dental caries [18]. Moreover, salivation is associated with inadequate water intake in patients undergoing bariatric surgery [13]. However, in this study, a decrease in salivary flow was found in both groups. It is unclear whether obesity has a direct or indirect negative effect on salivary flow rate. Based on this question, pro-inflammatory cytokines derived from adipocytes and macrophages that accumulate in adipose tissue [18], can negatively affect the function of the

salivary glands due to chronic low-grade inflammation in the gland. In addition, the authors reported increased levels of proinflammatory cytokines in the gingival fluid of obese adolescents when compared to normal weight subjects [17] , which also indicates a hyperinflammatory response in periodontal tissues.

Data from the present study showed that there was no correlation between decreased salivary flow and oral disease, although some researchers found a strong relationship between saliva volume and the development of periodontal disease, caries, and tooth wear [15]. The relationship between antimicrobial drugs. However, bariatric patients had more disease than obese patients .

Oral health and nutrition can have a synergistic bidirectional relationship. Infectious diseases of the oral cavity and systemic diseases with oral manifestations affect the functional ability to eat by influencing diet and nutritional status [22]. Poor oral health and tooth loss negatively impact speech function and the ability to eat healthy foods. Likewise, nutrition and diet can influence the development and integrity of the oral cavity, as well as the progression of oral diseases.

Bariatric surgery is very important for your health; however, a multi-professional staff is required to properly care for patients .

Conclusion. Bariatric patients had a prevalence of oral disease similar to that of obese patients, but periodontal pocket conditions were more common in bariatric patients . Maintaining periodontal health can be considered a good strategy for morbidly obese and bariatric patients .

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