

Oral Health Conditions after Bariatric Surgery: A 6 Months Follow Up Study

Rupal Mehta^{1*} Neeta Bhavsar² Gaurav Girdhar³

¹PhD Scholar, Department of Periodontology and Implantology, Gujarat University, Ahmedabad, Gujarat, India.

¹Professor and Head, Department of Periodontology and Implantology, Government Dental College, Gujarat University, Ahmedabad, Gujarat, India.

³Senior Lecturer, Department of Periodontology and Implantology, Karnavati School of Dentistry, Gujarat University, Ahmedabad, Gujarat, India.

ABSTRACT

Background: The incidence of bariatric surgery is increased due to increased prevalence of obesity. Bariatric surgery is done when conventional management with diet restriction, exercise and pharmacological measures fail to give results. The time period during and after bariatric surgery brings drastic changes in the oral environment and health, which could lead to a greater number of dental patients. Obesity is often associated with periodontal disease, therefore, investigation of the oral health status in these patients is very important.

Materials and Methods: Cross-sectional study was conducted among 35 patients who had undergone bariatric surgery. All patients attended the dental department of the hospital, for oral clinical evaluations. Caries experience was assessed by the decayed, missing, and filled teeth (DMFT) index. Periodontal examination was performed using the included plaque index (PI), probing pocket depth (PPD), bleeding on probing (BOP) and presence of calculus.

Results: BMI was statistically significantly decreased (10 kg/m^2) after bariatric surgery. HbA1c among non-diabetic and diabetic cases was also statistically significantly decreased after bariatric surgery. Fasting glucose among non-diabetic cases was statistically significantly decreased after bariatric surgery. DMFT was statistically significantly increased after bariatric surgery in all patients with increase in the number of fillings and extractions.

Conclusion: Bariatric surgery did not have a significant effect on oral health nor on the perception of quality of life influenced by oral conditions, in spite of significant weight loss and improvements in general health parameters.

Keywords: Bariatric Surgery, Obesity, Oral Health, DMFT.

INTRODUCTION

Obesity is a pandemic and a chronic disease which has become a one of the major public health concern for developed and developing countries and create lots of socioeconomic problems¹. More than 1.9 billion adults are overweight and 650 million are obese. Overweight or obese are responsible for almost 2.8 million deaths. Consumption of energy dense food (i.e. unhealthy food habits), sedentary life style, lack of health care

services and financial support are responsible for obesity and its adverse consequences. In India, more than 135 million people are affected by obesity. The prevalence of obesity in India varies due to age, gender, geographical environment, socio-economic status, etc.²

The incidence of bariatric surgery is increased due to increased prevalence of obesity and it leads to a

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*Correspondence Dr. Rupal Mehta.

Department of Periodontology and Implantology, Karnavati School of Dentistry, Gujarat University, Ahmedabad, Gujarat, India.

Email: rupal793@gmail.com

greater number of dental patients³⁻⁶. A study done by Heling et al said that 34% of patients noted an increase in number of dental visits following bariatric surgery.⁷

Obesity is often associated with periodontal disease, therefore, investigation of the oral health status in these patients is very important. Similar inflammatory and immune mechanisms and secretion of adipokines from adipose tissue is responsible for the common pathway of development for obesity and periodontitis. Obesity also leads to dental wear because of gastro-esophageal reflux, causing enamel surface erosion and anxiety, which may cause bruxism (dental attrition).⁸⁻¹¹

The aim of the present study was to verify oral alterations in patients before and after bariatric surgery, identify the occurrence of dental caries, periodontal diseases and dental wear, and to correlate oral health with quality of life in these patients.

MATERIALS AND METHODS

This was a cross-sectional study conducted among 35 patients undergone bariatric surgery at various tertiary care hospitals in Gujarat during January 2018 to December 2019. Oral clinical evaluation of the patients was done at the Dental Department of that hospital.

Inclusion criteria were: patients scheduled for all types of bariatric surgeries (gastric band, sleeve gastrectomy, biliopancreatic diversion with duodenal switch or gastric bypass), minimum 20 teeth present in the oral cavity. Exclusion criteria included patients under the age of 18, patients who have received periodontal treatment 6 months prior to the baseline evaluation and pregnant women.

All patients attended the dental department for oral clinical evaluations up to 6 months after surgery. Caries experience was assessed by the decayed, missing, and filled teeth (DMFT) index. Periodontal examination was performed using the Ramfjord index teeth and included plaque index (PI), probing pocket depth (PPD), bleeding on probing (BOP) and presence of calculus. Additionally, the presence and condition of removable dentures and changes in oral soft tissues were recorded. In addition, the impact of this procedure and its outcome on the

quality of life of the patients were evaluated using the Self-reported Oral Health Impact Profile – 14 questionnaires (OHIP-14).

Qualitative data were expressed as percentages and proportions. Quantitative data were expressed as mean and standard deviation. The differences between two groups with respect to continuous variables were analyzed using unpaired t-test while categorical variables were analyzed using chi-square test. All the statistical tests were performed in Epi Info 3.5.1 software by CDC, USA. P value <0.05 was considered as statistically significant while P value <0.05 was considered as statistically highly significant.

RESULTS

Table 1: Socio-clinical parameters of study participants [N=35]

Variable	Number [%]
Mean Age [mean ± SD]	36.9 ± 11.8 years
Mean follow-up period [mean ± SD]	6.2 ± 1.3 months
Male:female ratio	19:16
Smoking Habit	
Yes	8 [22.9]
No	27 [77.1]
DM	
Yes	14 [40]
No	21 [60]

Table 1 shows that mean age was 36.9 years with 11.8 SD. Patients were examined before and after surgery, with a mean follow-up period of 6.2 months with 1.3 SD. Male female ratio was 19:16. Almost 22.9% participants have smoking habits and 40% were suffering from DM.

Table 2: Change in clinical variable after bariatric surgery

Variable	Before Surgery (Mean ± SD)	After Surgery (Mean ± SD)	p-Value*
BMI (kg/m ²)	39.9 ± 6.1	29.1 ± 5.9	0.01
HbA1c (%)	6.1 ± 0.9	5.3 ± 0.8	0.01
HbA1c among Diabetic Patients (%)	6.8 ± 1.1	5.6 ± 1.0	0.01
Fasting Glucose (mg/dl)	119.3 ± 45.9	91.8 ± 13.3	0.001
Fasting Glucose among Diabetic Patients (mg/dl)	169.5 ± 93.0	106.8 ± 23.9	0.3

Table 2 shows that BMI before and after surgery was 39.9 kg/m² with 6.1 SD and with 1.1 SD and 5.6% with 1.0 SD respectively and difference was statistically significant ($p < 0.05$). Fasting glucose before and after surgery was 119.3 mg/dL with 45.9 SD and 91.8 kg/m² with 13.3 SD respectively and difference was statistically significant ($p < 0.05$). Fasting Glucose among Diabetic Patients before and after surgery was 169.5 mg/dL with 93.0 SD and 106.8 mg/dL with 23.9 SD respectively and difference was statistically not significant ($p > 0.05$).

Table 3: Changes in Oral Variables Following Bariatric Surgery.

Variable	Value Before (Mean $\pm$ SD)	Value After (Mean $\pm$ SD)	P-Value*
D	1.4 $\pm$ 1.5	1.4 $\pm$ 1.9	0.31
M	2.5 $\pm$ 3.9	2.8 $\pm$ 4.1	0.001
F	7.3 $\pm$ 5.5	8.4 $\pm$ 5.1	0.03
DMFT	11.2 $\pm$ 5.9	12.6 $\pm$ 6.8	0.001
Mean PI	1.73 $\pm$ 0.7	1.65 $\pm$ 0.5	0.34
Teeth with Calculus (%)	38 $\pm$ 34.6	35.7 $\pm$ 28.5	0.734
Mean PPD (mm)	2.58 $\pm$ 0.7	2.51 $\pm$ 0.7	0.13
Teeth with BOP (%)	61.9 $\pm$ 37.8	67.9 $\pm$ 33.1	0.69
OHIP - 14	1.7 $\pm$ 0.4	1.6 $\pm$ 0.4	0.67

D = Decayed, M = Missing, F = Filled

DMFT significantly increased from 11.2 $\pm$ 5.9 to 12.6 $\pm$ 6.8 ($p < 0.05$). However, changes in the number of active caries were not noted (mean change 0 $\pm$ 1.5, $p = 0.31$); To the contrary, the number of fillings and missing teeth significantly increased by 0.9 with 2.4 SD ($p < 0.05$) and 0.4 with 0.4 SD ($p < 0.05$), respectively. The periodontal status of these patients did not change between baseline and six months post-surgery. PI scores at baseline and 6 months were 1.73 with 0.7 SD and 1.65 with 0.5 SD, respectively ($p = 0.34$).

The % of teeth with calculus (38 with 34.6 SD to 35.9 with 29.3 SD, $p = 0.734$) were similar before and after bariatric surgery. Additionally, no changes in mean PPD ($p > 0.05$) nor in the % of teeth with BOP ($p > 0.05$) were acknowledged. The impact of oral conditions on quality of life, as assessed by OHIP-14 questionnaires did not seem to be influenced by bariatric surgery. Mean overall score change from 1.7 with 0.4 SD to 1.6 with 0.4 SD which did not reach statistical significance ($p > 0.05$).

DISCUSSION

29.1 kg/m² with 5.9 SD respectively and difference was Obesity has great socioeconomic implications for health systems. It causes monetary and social burden on the society and the country as a whole. The favorable factor for bariatric surgery is that it is most efficient treatment for morbid obesity with a lasting effect on weight control. The benefits of bariatric surgery are that it enhances health, quality of life and long-term weight loss, and this is sufficient to reduce obesity-related comorbidities such as diabetes mellitus, cardio-vascular diseases or prevalence for various cancers. Almost 89% risk of death due to obesity is reduce by bariatric surgery.^{12,13}

Present study found that 1/5th participants have history of smoking and 2/5th participants have diabetes. Our study found that BMI was statistically significantly decreased (10 kg/m²) after bariatric surgery. HbA1c among non-diabetic and diabetic cases was also statistically significantly decreased after bariatric surgery. Fasting glucose among non-diabetic cases was statistically significantly decreased after bariatric surgery.

Our study found that mean DMFT was statistically significantly increased after bariatric surgery in all patients with increase in the number of fillings and extractions. This may demonstrate that, following bariatric surgery, these patients have taken the initiative to enhance their dental status by seeking dental treatment.

Hague et al.⁸ followed-up a patient after bariatric surgery and concluded that the patient had an increase of dental caries. Thus, it is imperative to take care of the teeth and gingiva during the convalescent period after bariatric surgery.

Pataro et al. in his cross-sectional study observed that the prevalence of periodontitis ranging from 70.69% to 91.66% among groups before and after bariatric surgery. After bariatric surgery, bone loss frequently occurs because the patients may present metabolic bone disease.¹⁴

There was also changes occurred in Mean plaque index, teeth with calculus, mean PPD, teeth with BOP and OHIP-14 after surgery but it was statistically not significant ($p > 0.05$).

Following bariatric surgery, oral care is very crucial. Care after surgery like: patients need to chew slowly and for a longer time to prevent adverse effects such as nausea and vomiting. Use of remineralizing mouthwash, interdental brushes and frequent dental checkups are indicated. Therefore, oral rehabilitation of patients undergoing bariatric surgery is essential in order to reduce the side-effects after surgery and improve the quality of life of patients before and after the intervention.

COCNLUSION

Bariatric surgery did not have a significant effect on oral health nor on the perception of quality of life influenced by oral conditions, in spite of significant weight loss and improvements in general health parameters. Maintenance of oral health conditions may be considered a good strategy for preventing some of the side-effects of bariatric surgery.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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