



# Impact of COVID-19 Lockdown on Short-term Weight Loss in a Single Italian Institution

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## Abstract

Italy was the first European country to have a major outbreak of COVID-19. Bariatric procedures were stopped and telemedicine had to be implemented. A large percentage of patients struggled to follow postoperative diet and to start physical activity due to social restrictions. We have compared short-term outcomes of patients who had bariatric procedures prior to lockdown with subjects that had undergone obesity surgery in the same period of the previous year at our institution. A total number of 63 patients were included in this study. Weight loss at 1, 3 and 6 postoperative months in the 2019 group was significantly higher at any point of follow-up when compared to 2020. Social limitations and nonattendance of clinical appointments may have compromised early results.

**Keywords** COVID-19 · Coronavirus · Bariatric surgery · Telemedicine · Sleeve gastrectomy · One-anastomosis gastric bypass

## Introduction

In December 2019, an epidemic of respiratory tract disease caused by SARS-CoV-2 was reported in Wuhan, China. Since then, the SARS-CoV-2-related disease, so-called coronavirus disease 2019 (COVID-19), has been rapidly spreading all over the world; on March 11, the World Health

Organization (WHO) declared the infection a pandemic. Italy is the most hit country in Europe with 2,039,759 confirmed cases and 71,620 deaths by 28 December 2020 [1]. The first wave of COVID-19 pandemic created rapid distress in the public health system in Italy due to the need to treat an overwhelming number of infected subjects [2]. Financial, structural and medical resources were assigned to assist critically ill patients with COVID-19; all non-urgent/non-oncologic outpatient activities and surgical procedures were suddenly interrupted. Specifically, bariatric surgery was stopped for several months and patients' follow-up was badly influenced by social restrictions imposed by the government during the lockdown and afterwards [3].

Over the last 30 years, obesity pandemic has been steadily rising and bariatric surgery has represented the most effective treatment for this chronic medical condition and its related diseases [4, 5]. In the current COVID-19 era, bariatric teams are doing their best to provide a regular postoperative follow-up, but telemedicine had to be implemented due to the social limitations. At our surgical department, postoperative outpatient visits were not interrupted during lockdown, but many patients did not attend the appointment due to the fear of nosocomial exposure to the coronavirus infection and restrictions on public and private transports.

The purpose of this study was to evaluate the effects of social restrictions on patients' compliance to postoperative follow-up and consequences on short-term weight loss.

## Key Points:

- Patients who underwent bariatric procedures in 2020 before the lockdown achieved lesser weight loss than those who had surgery in 2019;
- Nonattendance of clinical appointments was high during the lockdown;
- Social limitations may have compromised weight loss.

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## Methods

Data on all patients that had undergone bariatric surgery between 1 January and 8 March 2020 (date of the beginning of the Italian lockdown) at our university bariatric department were collected. Exclusion criteria were previous abdominal or bariatric surgery, other diseases impairing normal physical activity, psychiatric or nutritional disorders. Preoperative studied variables were age, gender, body mass index (BMI), diagnosis of type 2 diabetes (TD2M), hypertension (HTN) and obstructive sleep apnoea disease (OSAS), type of surgery (sleeve gastrectomy or mini-/one-anastomosis gastric bypass). Weight loss was assessed at 1, 3 and 6 months through clinical evaluation or, in case of nonattendance, using telemedicine and it was calculated as percentage of excess BMI loss:  $(\text{Initial BMI} - \text{follow-up BMI} / \text{initial BMI} - 25) \times 100$ . Nonattendance was defined as missed scheduled visit.

A control cohort of patients was sampled including all subjects who were operated on in the same period of the previous year (1 January to 8 March 2019). Preoperative characteristics were measured to detect if cohorts were comparable, while follow-up %EBMIL was confronted to detect any possible effect of lockdown on weight loss. Percentages of nonattendance in the two groups were recorded and compared.

All procedures were performed by the same surgical team following standard operative techniques of sleeve gastrectomy (SG) and mini-/one-anastomosis gastric bypass (MGB/OAGB), which have been previously published [6, 7].

Remission at 6 months of diabetes was considered as fasting blood glucose < 126 mg/dL on two different occasions and as a value of glycated haemoglobin A1c (HbA1C) < 6.55% without necessity for antidiabetic medications. Hypertension remission was defined as blood pressure < 140/90 with no requirement for antihypertensive medication. Hypercholesterolaemia, hypertriglyceridemia and low high-density lipoprotein cholesterol were diagnosed when values were respectively > 200 mg/dL, 150 mg/dL and 40 mg/dL.

Informed consent was signed from all individual participants included in the study.

## Statistics

Variables were expressed as mean±deviation standard or percentages (%). Frequencies were compared with chi-square test or Fisher's exact test and a one-way ANOVA analysis was carried out to compare weight loss. For statistical analysis, SPSS statistical package (version 26) (SPSS™, Chicago, IL, USA) was used. Significance was set for *p* value < 0.05.

## Results

A total number of 63 patients were included in this study. Thirty-two patients underwent bariatric surgery in the selected period of 2020 and 31 subjects were operated on in the respective months of 2019. In the 2020 group, 18 received MGB/OAGB while 14 patients underwent SG. In the 2019 cohort, 19 patients received MGB/OAGB while 12 patients underwent SG. Baseline characteristics of the two groups are reported in Table 1; no difference was recorded.

Weight loss at 1, 3 and 6 postoperative months in the 2019 group was significantly higher at any point of follow-up when compared to 2020 ( $29.6 \pm 11.5$  vs  $21.3 \pm 8.1$   $p=0.002$ ,  $55.2 \pm 12.4$  vs  $40.2 \pm 13.2$   $p<0.001$  and  $77.1 \pm 18.9$  vs  $62.3 \pm 18.9$   $p=0.003$  respectively; Fig. 1).

Comparison of remission at 6 months from obesity-related diseases did not have significant results as shown in Table 2.

In 2019, no patient missed clinical appointments in the first 6 months, while in 2020, the rate of nonattendance at 1, 3 and 6 months was 15.6% (0 vs 5  $p=0.05$ ), 18.7% (0 vs 6  $p=0.02$ ) and 31.3% (0 vs 10  $p=0.001$ ).

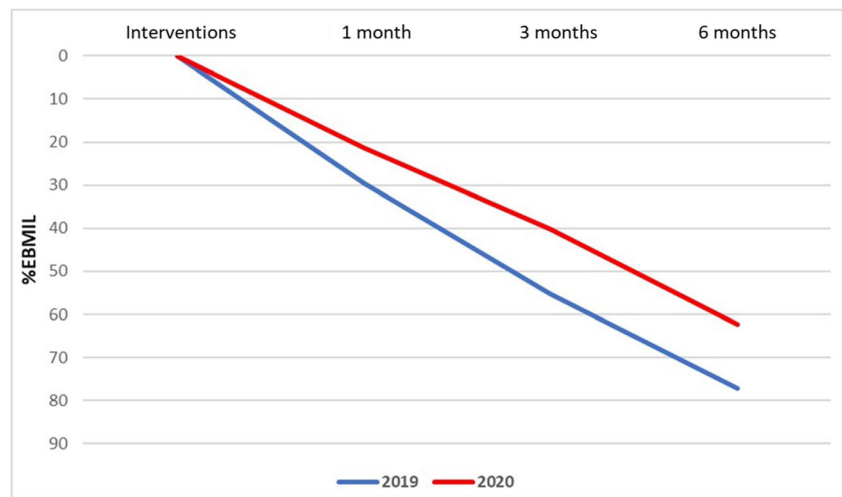
## Discussion

Despite anatomical and metabolic changes induced by restrictive and malabsorptive procedures play a determinant role in the success of bariatric surgery, regular follow-up is mandatory to increase compliance to the postoperative prescriptions. In the first months after surgery, enthusiasm coming from initial weight loss induces patients to attend regular clinical appointments. Indeed, we found 100% attendance in the 2019 group. Conversely, during the first Italian lockdown, severe social restrictions have been imposed with serious repercussions on postoperative follow-up. In fact, even if clinical appointments were guaranteed, a certain percentage of patients asked to postpone their visit or had to be contacted through telemedicine to avoid drop-out. However, nonattendance rate increased with time and it was 30% at 6 months, probably because subjects were less worried about postoperative

**Table 1** Baseline characteristics

	2020 group	2019 group	<i>p</i> value
Number of patients	32/63	31/63	0.85
Age (years)	43.4 ± 10.2	39.9 ± 10.7	0.19
Gender (F:M)	21:11	23:8	0.45
Preop BMI (kg/m <sup>2</sup> )	44.5 ± 4.8	44.7 ± 6.8	0.85
Type 2 diabetes	5/32	3/31	0.47
Hypertension	5/32	7/31	0.48
Obstructive sleep apnoea disease	1/32	3/31	0.35
Type of surgery (MGB/OAGB: SG)	18:14	19:12	0.68

**Fig. 1** Short-term %EBMIL in the two groups.  $p < 0.05$  at 1, 3 and 6 months



complications and more satisfied with the weight loss. Moreover, those who came to the outpatient clinic followed with difficulty the prescribed diet and did not start a regular physical activity due to the sedentary lifestyle forced by the pandemic. Analysis of weight loss showed that patients in the 2020 group had significantly worse outcomes than individuals who underwent bariatric surgery in 2019 without social limitations. One case of postoperative pregnancy was also recorded at the fifth postoperative month and special care had to be given [8] despite restrictions.

Also, rates of remission from obesity-related diseases were lower in 2020 even if this difference was not significant. However, 6 months may be not enough to document an evident improvement of these conditions and the duration of remission cannot be predicted with such a short period of time.

Many factors may have influenced these poor short-term outcomes in 2020, but a higher rate of nonattendance and reduced opportunities for physical activity may have been determinant. In the last years, even before the COVID-19 pandemic, there has been a big discussion regarding advantages coming from telemedicine [9], but our small experience enlightens that face-to-face clinical appointments may still be mandatory, at least in the first postoperative period. Patients with obesity need to be constantly stimulated in their weight loss path and video or telephone consultations do not encourage them to pursue a more active lifestyle. However, this pandemic offers the opportunity to develop and improve

specific video-/tele-monitoring systems for the follow-up of bariatric patients.

After the SARS-CoV-2 outbreak, the bariatric community mainly focused on the 30-day morbidity and mortality [10] and possible effects of the infection in the early postoperative period. Current literature seems to have forgotten about all those individuals who had recently undergone surgery when the COVID-19 spread worldwide. Our data warn about risks coming from 2020 house-bound lifestyle, which may have compromise short- and long-term weight loss.

### Conclusion

Our small retrospective analysis showed that weight loss was lower in the 2020 group of patients when compared to subjects who had undergone bariatric surgery in 2019. Among other factors, social limitations and implementation of telemedicine may have encouraged a house-bound lifestyle which is detrimental for bariatric patients.

### Declarations

**Ethical Approval** For this type of study, formal consent is not required.

**Informed Consent Statement** Informed consent was obtained from all individual participants included in the study.

**Table 2** Remission from obesity-related disease at 6 months (TD2M, type 2 diabetes; HTN, hypertension; OSAS, obstructive sleep apnoea disease)

	Cases of remission in 2020 group <i>n</i> (%)	Cases of remission in 2019 group <i>n</i> (%)	<i>p</i> value
TD2M	2/5 (40%)	2/3 (66.7%)	1
HTN	2/5 (40%)	5/7 (71.4%)	0.55
OSAS	0/1 (0%)	2/3 (66.7%)	1

**Conflict of Interest** The authors declare no competing interests.

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