Bariatric Surgery to Target Obesity in the Renal Transplant Population: Preliminary Experience in a Single Center

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ABSTRACT

During the last century, obesity has become a global epidemic. The effect of obesity on renal transplantation may occur in perioperative complications and impairment of organ function. Obese patients have metabolic derangements that can be exacerbated after transplantation and obesity directly impacts most transplantation outcomes. These recipients are more likely to develop adverse graft events, such as delayed graft function and early graft loss. Furthermore, obesity is synergic to some immunosuppressive agents in triggering diabetes and hypertension. As behavioral weight loss programs show disappointing results in these patients, bariatric surgery has been considered as a means to achieve rapid and long-term weight loss.

Up-to-date literature shows laparoscopic bariatric surgery is feasible and safe in transplantation candidates and increases the rate of transplantation eligibility in obese patients with end-stage organ disease. There is no evidence that restrictive procedures modify the absorption of immunosuppressive medications. From 2013 to 2016 we performed six bariatric procedures (sleeve gastrectomy) on obese patients with renal transplantation; mean preoperative body mass index (BMI) was 39.8 kg/m^2. No postoperative complication was observed and no change in the immunosuppressive medications regimen was needed. Mean observed estimated weight loss was 27.6%, 44.1%, 74.2%, and 75.9% at 1, 3, 6, and 12 months follow-up, respectively. Our recommendation is to consider patients with BMI >30 kg/m^2 as temporarily ineligible for transplantation and as candidates to bariatric surgery if BMI >35 kg/m^2. We consider laparoscopic sleeve gastrectomy as a feasible, first-choice procedure in this specific population.

OBESITY directly impacts renal transplantation outcomes. Large population studies have clearly shown that patient and graft survival are lower in obese patients (body mass index [BMI] >30 kg/m^2) [1,2]. However, despite a poorer outcome, obese patients are still considered for transplantation because of the clear survival benefit as compared to the wait-listed dialysis patients [3].

Kolonko et al [4], in their analysis of post-transplantation pulsatility and resistance indexes, found that the obese patients had higher renal vascular resistance (an indicator of vascular stiffness), which was linked to the incidence of delayed graft function. A large United States Renal Data System (USRDS) database analysis by Meier-Kriesche et al [1] compared the results of stratified BMI groups. As the BMI increased by increments of 2 kg/m^2, there was an increase in the relative risk for graft failure and patient death. It may be difficult to know for sure whether these poorer outcomes were mediated by the increased incidence of comorbid conditions known to affect outcome or whether there were any intrinsic factors to obesity that could contribute.

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In a 2003 USRDS review, the outcomes of obese patients with transplantation were compared with matched controls that remained on dialysis. Renal transplantation was associated with a significantly reduced risk of mortality of 61% for deceased donors and 77% for living donors.

This study also stratified for BMI and concluded that the survival benefit of transplantation dropped off with a BMI >41 kg/m^2. It is at this point that the potential benefits of weight-loss surgery should be considered [5]. Results regarding patient and graft survival are consistent with multiple groups reporting that obesity does reduce patient and graft survival at 1 year, 5 years, or longer [1,6–11]. Indications are still debated in patients with BMI between 35 kg/m^2 and 40 kg/m^2. The literature that exists strongly supports proceeding with transplantation, although it clearly recognizes the increased morbidity and costs in the short term. It is also imperative to proceed only after an extensive and thorough evaluation, thereby assuring the best possible outcome for both the patient and the organ.

Bariatric surgery could offer a chance to target obesity in an effective and stable way in these patients. Golomb et al [12] recently published a case series on laparoscopic sleeve gastrectomy (LSG) in 10 renal transplant recipients. The median preoperative weight and BMI were 119 kg (96 kg to 152 kg) and 42 kg/m^2 (37–49), respectively. The median percent estimated weight loss (%EWL) was 54% at 3 months, 57% at 6 months, and 75% at 1 year.

The aim of our study was to analyze our case series of bariatric procedures in renal transplantation patients.

MATERIALS AND METHODS

Patients

We retrospectively analyzed our data on renal transplantation patients who presented with morbid obesity and were considered eligible for bariatric surgery from October 2013 to October 2016 at the Bariatric and Metabolic Surgery Unit, San Raffaele Hospital, Milan, Italy. Indications for surgery followed the American Society of Metabolic and Bariatric Surgery guidelines, which consider patients with BMI >40 kg/m^2 or BMI >35 kg/m^2 with comorbidities as candidates for surgery.

Preoperative Evaluation

Preoperative assessment at our institute includes a multidisciplinary evaluation (nutritional/metabolic, psychological, and psychiatric), bioelectrical impedance analysis, indirect calorimetry, upper-gastrointestinal endoscopy and abdominal ultrasound, echocardiogram, and pulmonary function test. Patients who do not present any critical psychological or behavioral disorder or gastrointestinal disease are considered fit for surgery. In patients with chronic illness or need for chronic medications, such as immunosuppressive regimens, a primarily malabsorptive procedure is not the first choice because of its chances to interfere with drug absorption and metabolism. We consider LSG as the most appropriate procedure in this group of patients.

Surgical Management

Surgery is performed under general anesthesia, according with the surgical standards for sleeve gastrectomy, using a 36-Ch orogastric calibration tube and an Echelon Flex Automatic 60-mm stapler with green and gold cartridges (Ethicon). The gastric stapling starts 5 cm proximally to the gastric side of the pylorus. We usually apply hemostatic clips on the staple line, but do not use any sealant mean or buttress material. A methylene blue test is performed via the orogastric tube and a 12-mm capillary drain is placed beside the stomach. Prophylactic low-molecular weight heparin administration is started 6 hours postoperatively (nadroparin 4000 UI per day) and administered for 2 weeks after discharge.

Postoperative Treatment Protocol and Follow-up Examination

After surgery, patients are kept nihil by mouth for 2 days with intravenous hydration and morphine patient-controlled administration. An upper-abdomen computed tomographic scan with oral and intravenous contrast medium is performed in postoperative day 2. If neither gastric leakage nor intra-abdominal collections are detected, the surgical drain is removed and patient is put on a fluid hypocaloric diet regimen (Nutricia Nutridrink 50 mL + water 50 mL each and every hour for 12 hours to 16 hours a day). At discharge, after nutritional reassessment, a balanced fluid diet is given for 30 days. The surgical follow-up schedule consists of outpatient visits at 1, 3, 6, and 12 months after surgery. At follow-up, after careful objective examination, BMI, excess of weight loss (EWL%), medications dosage, and medical, functional and surgical conditions are registered. Renal function is carefully monitored throughout the follow-up time, and any signs of dehydration or impaired renal function are promptly treated.

RESULTS

From October 2013 to October 2016, six patients (four males and two females, Table 1) who had received either renal or combined renal-pancreas transplantations have undergone bariatric surgery (sleeve gastrectomy) for grade II or grade III morbid obesity. Mean age at surgery was 50.3 years and mean time from transplantation was 91 months (range, 31 months to 131 months).

Mean BMI at surgery was 39.8 kg/m^2 (range, 35.0 kg/m^2 to 51.0 kg/m^2). Five of six procedures were performed laparoscopically in a mean operating time of 114 minutes. No intraoperative or postoperative complication was observed. Patients were treated according to our institute standard protocol, as stated above. Oral feeding was resumed 2.6 days after surgery. Mean hospital stay was 5.2 days. The surgical follow-up schedule was at 1, 3, 6, and 12 months after surgery. Mean observed %EWL was 27.6% at 1 month, 44.1% at 3 months, 74.2% at 6 months, and 75.9% at 12 months (mean follow-up time, 15.6 months). No significant weight regain or change in glomerular filtration rate and dosage of immunosuppressive medications was observed during follow-up. Two patients were readmitted in the first 30 days after discharge for renal function impairment due to dehydration (inadequate assumption of fluids). Kidney function tests were all normal at the following follow-up visits.

DISCUSSION

As a method of permanent weight loss, obese transplantation candidates and recipients are now being