ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2017) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Laparoscopic sleeve gastrectomy: gateway to kidney transplantation

Katrin Kienzl-Wagner, M.D., Annemarie Weissenbacher, M.D., Philipp Gehwolf, M.D., Heinz Wykypiel, M.D., Dietmar Öfner, M.D., Stefan Schneeberger, M.D.*

Department of Visceral, Transplant, and Thoracic Surgery, Innsbruck Medical University, Innsbruck, Austria

Received August 23, 2016; revised November 29, 2016; accepted January 1, 2017

Abstract

Background: The prevalence of obesity and obesity-related morbidity in end-stage renal disease patients is rising. Although it is established that obesity does not abrogate the transplant benefit with respect to lower long-term mortality and cardiovascular risk, it is associated with increased graft failure, delayed graft function, surgical complications, prolonged hospital stay, and costs.

Objectives: To examine the safety and efficacy of LSG (laparoscopic sleeve gastrectomy) in renal transplant candidates and evaluate transplant outcomes.

Setting: Single-center prospective nonrandomized trial

Methods: We here report on a prospective single-center trial establishing a 2-step approach for obese renal transplant candidates. Patients with end-stage renal disease and a BMI (body mass index) of 35 kg/m^2 or higher underwent laparoscopic sleeve gastrectomy. After reaching a BMI of <35 kg/m^2, patients were waitlisted for kidney transplantation. Age, gender, body mass index (BMI), associated co-morbidities, cause of end-stage renal disease, surgical complications, and outcome after kidney transplantation (graft survival, incidence of delayed graft function, incidence of rejection, serum creatinine) were collected.

Results: LSG was performed in 8 renal transplant candidates with a mean BMI of 38.8 kg/m^2 each. BMI dropped to below 35 kg/m^2 within a median of 3 months. Percent excess body mass index loss (%EBMIL) was 62.7% at 1 year after LSG. Within 17 months (mean) after metabolic surgery, 7 patients underwent kidney transplantation. All transplants were successful with a serum creatinine of 1.9 ± .8 mg/dL at discharge and stable allograft function thereafter. Mean follow-up was 3.2 ± 1.4 years; no patient was lost to follow-up.

Conclusion: LSG is safe and efficacious for treatment of obesity in renal transplant candidates. Rapid and sustained weight loss and subsequent waitlisting for kidney transplantation may reduce overall and in particular posttransplant patient morbidity. (Surg Obes Relat Dis 2017;▮:00–00.)

Keywords: Sleeve gastrectomy; Bariatric surgery; Metabolic surgery; Kidney transplantation; End-stage renal disease; Transplantation; Dialysis

Obesity is a modern epidemic in the general population, but also in patients with end-stage renal disease. Obesity and the metabolic syndrome pose a significant challenge for candidate selection, waitlist management and outcome prediction before and after transplantation [1]. Kidney transplantation in obese recipients is clearly associated with a survival benefit compared with treatment with dialysis. However, patients with a BMI (body mass index) ≥ 40 kg/m^2 benefit significantly less than do patients with a lower BMI (kidney transplantation is associated with 48% reduction in the risk of death in patients with BMI ≥ 40 kg/m^2, but a ≥ 66% reduction in patients with

The study was not funded by a commercial organization.

*Correspondence: Stefan Schneeberger, M.D., Department of Visceral, Transplant, and Thoracic Surgery, Innsbruck Medical University Anichstrasse 35 6020 Innsbruck, Austria.

E-mail: stefan.schneeberger@i-med.ac.at

http://dx.doi.org/10.1016/j.soard.2017.01.005

1550-7289/

BMI < 40 kg/m^2) [2,3]. Furthermore, obesity is associated with increased delayed graft function, acute rejection, graft failure, surgical complications, prolonged hospital stay, and costs [4–12]. In recognition of these data, many transplant centers apply an upper BMI limit as a criterion for renal transplant candidacy [13].

Metabolic surgery has proven to be highly effective for weight reduction compared with medical weight loss approaches [14]. It has been found that metabolic surgery can be safely performed in dialysis patients [15,16]. Laparoscopic sleeve gastrectomy (LSG) offers several advantages over gastric bypass surgery in patients with end-stage renal disease (ESRD). It is technically less challenging, faster, has a lower incidence of surgical complications, and shows comparable results with respect to excess weight loss [17]. Most importantly, LSG does not affect intestinal drug absorption and therefore does not alter absorption of immunosuppressive drugs that will be required in the context of kidney transplantation.

In an effort to overcome morbid obesity as a barrier for kidney transplantation, we offer a 2-step approach for morbidly obese renal transplant candidates referred to our center. Patients with end-stage renal disease eligible for kidney transplantation, but with a BMI > 35 kg/m^2 first undergo laparoscopic sleeve gastrectomy. After sustained weight loss with a BMI < 35 kg/m^2 patients are reevaluated and then waitlisted for kidney transplantation. Since the live donor rate in our region is below 20%, the majority of patients are served with organs from cadaveric donors. As soon as a compatible organ is allocated to the individual on the waiting list, kidney transplantation is performed. We here report on our prospective LSG case series in renal transplant candidates.

Patients and methods

Patient cohort

We prospectively evaluated all patients referred for renal transplantation with a BMI exceeding 35 kg/m^2. Since July 2011, 8 patients were enrolled in the study. The study protocol was approved by the local ethics committee (AN3964 288/4.2). All patients provided written informed consent. Patients were included in the study if they had end-stage renal disease and fulfilled the criteria for metabolic surgery in Austria (BMI > 40 kg/m^2 or BMI > 35 kg/m^2 and at least 1 obesity-related co-morbidity). Preoperative evaluation was done by a multidisciplinary team (including an endocrinologist, a psychiatrist, a bariatric surgeon, a nutritionist, and a nephrologist) and included endoscopy, esophageal manometry, and upper gastrointestinal series. All patients underwent laparoscopic sleeve gastrectomy for weight reduction.

Study endpoints included: LSG (%EBMIL, change in BMI, %total weight loss), the proportion of patients reaching a BMI < 35 kg/m^2 and consequently meeting the criteria for wait listing, the proportion of patients receiving a kidney transplant, kidney transplant outcome parameters (graft survival, incidence of delayed graft function, incidence of rejection, serum creatinine), and complications after LSG and kidney transplantation.

Operative technique

LSG was performed with standardized techniques. A 35-Fr bougie along the lesser curvature was used to calibrate the gastric tube. Longitudinal resection of the stomach was done from 3 to 6 cm orally of the pylorus to the angle of His. The staple line was routinely reinforced with clips or a running absorbable suture. Kidney transplantation was performed through an extraperitoneal approach in the iliac fossa, the renal vessels were anastomosed to the external iliac vessels, and the ureter was implanted into the bladder by extravesical ureterocystostomy using the antireflux technique according to Liche–Gregoire. A double-J stent was routinely placed in the ureter and removed 2 to 6 weeks after transplantation.

Statistical analysis

For descriptive statistical analysis mean values, standard deviations, absolute and relative frequencies were calculated. Statistical analysis was performed using IBM SPSS Statistics, software version 22.0 (IBM Corp., Armonk, NY).

Results

Patient characteristics

Eight patients underwent LSG for weight reduction before wait listing for kidney transplantation. Patients were on dialysis for 2.9 ± 1.4 years at the time of LSG; 7 patients were prepared to be waitlisted for a first kidney transplant; 1 patient presented for kidney retransplantation. Causes of end-stage renal disease were diabetic nephropathy in 3 patients, and IgA nephropathy, analgesic nephropathy, glomerulonephritis, reflux nephropathy, and preeclampsia in 1 patient each. Mean age at LSG was 48 (range: 25–62) years, and 62% of the patients were female. Mean BMI pre-LSG was 38.8 ± 3.8 kg/m^2. Co-morbidities included arterial hypertension in 6 patients, diabetes in 4 patients, hyperlipidemia in 2 patients, joint disease in 2 patients, and sleep apnea in 2 patients. Mean follow-up was 3.2 ± 1.4 years; no patient was lost to follow-up. (Table 1)

Outcome after LSG

At 1, 2, and 3 years after LSG mean %EBMIL was 62.7 ± 15.9%, 63.6 ± 19.4%, and 67.9 ± 35.6%, respectively (Fig. 1B). Mean BMI pre-LSG was 38.8 ± 3.8 kg/m^2 and decreased to 30.4 ± 10.7 kg/m^2, 30.7 ± 4.4 kg/m2, and 30.7 ± 6.0 kg/m^2 at 1, 2, and 3 years after LSG