

Roux-en-Y gastric bypass in dialysed morbidly obese patients as a preparation for a kidney transplantation: case series

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Abstract

Morbid obesity in group of patients with chronic kidney failure has an important impact on access to kidney transplantation. Bariatric procedures can be used as an preparation for potential recipients, which can help to improve their metabolic status and reduce weight. We present the first experience of our centre based on a series of 3 morbidly obese patients with chronic kidney disease underwent Roux-en-Y gastric bypass before being reported to the national registry of recipients.

Key words: renal failure, morbid obesity, gastric bypass, kidney transplantation.

Introduction

Obesity in patients with chronic kidney disease may preclude access to kidney transplantation. Weight loss surgery has demonstrated effectiveness in the treatment of obesity, but also diabetes, and hypertension, both of which are noted to be primary causes of chronic kidney disease. Bariatric surgery is becoming more recognized as a treatment option either to help to diminish progression of chronic kidney disease or to prepare patients for kidney transplantation if weight loss is needed to qualify for transplant candidacy [1]. Obesity has been associated with poor graft and patient survival after kidney transplantation requiring significant increase of anti-rejection drugs [2]. Safety and efficacy of bariatric surgery in patients with kidney failure were confirmed with the most common procedure, Roux-en-Y gastric bypass (RYGB). Bariatric surgery seems an interesting option for improving outcomes before and after kidney transplantation [3].

We present the first experience of our centre based on a series of 3 morbidly obese patients with chronic kidney disease being prepared for kidney transplantation with bariatric surgery.

Case report

In the Department of General, Endocrine and Transplant Surgery from January to May 2012 there were three dialysed patients who underwent bariatric surgery to improve metabolic status and increase chances for kidney transplantation. All patients with body mass index (BMI) > 35 kg/m² had a history of unsuccessful dietary treatment. After nephrological and surgical consultation they were enrolled in the preparatory period for bariatric surgery. The patients were qualified for RYGB (Table I).

Patient 1 was a 61-year-old man with BMI 40.5 kg/m² with type 2 diabetes (DMt2), arterial hypertension, hyperlipidaemia, and stable angina pectoris. He had been dialysed for two years because of chronic kidney disease due to diabetic nephropathy.

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Patient 2 was a 49-year-old woman with BMI 42.1 kg/m² with DMt2 and arterial hypertension. She had been dialysed for over three years because of chronic kidney disease due to diabetic nephropathy.

Patient 3 was a 55-year-old woman with BMI 37.0 kg/m² with chronic obstructive pulmonary disease. She had been dialysed for 7 years because of chronic kidney disease due to hypertensive nephropathy (Table II).

Patients 1 and 2 underwent laparoscopic RYGB (LRYGB). Patient 3 underwent an open procedure due to several other previous operations. Procedures were standardized with stomach pouch volume of 50-70 ml, bowel loops: bilio-pancreatic 80-100 cm, alimentary 120-130 ml. The procedures and postoperative course were both uneventful.

All patients were followed up 1 month and 3 months after surgery. Patient 1 reported a decrease of dialysis time by 25 min with a substantial decrease of urea level from 110 mg/dl before to 24.8 mg/dl after LRYGB; the level of creatinine was 7.6 mg/dl, and estimated glomerular filtration rate (eGFR) 5 ml/min/1.73 m² (measured after dialysis). After surgery glycaemia normalized, which made insulin therapy unnecessary. The level of glycolated haemoglobin (HbA_{1c}) 3 months after surgery was 5.7%, while before the operation the level of HbA_{1c} was 7.1%.

For patient 2 daily insulin doses were reduced from over 80 units to 10 units and HbA_{1c} 3 months after LRYGB was 6.1% (compared to 7.9% before). Although the dialysis time was not significantly reduced, urea level decreased from 86.9 mg/dl before

LRYGB to 47.9 mg/dl after LRYGB (measured after dialysis). Creatinine level and eGFR did not change significantly and were 5.3 mg/dl and 6 ml/min/1.73 m² respectively.

For patient 3, 1 month after LRYGB surgery with 13 kg of weight loss, arterial hypertension normalized (prior to surgery it was difficult to control pharmacologically) and hypotensive drugs were reduced. A difficulty was encountered with adjusting the dialysis parameters to rapid weight loss and reducing the doses of hypotensive drugs, which led to a hypotonic episode with superficial head injury. Preoperatively the duration of dialysis was utilized to control the pharmacologically uncontrolled hypertension. Urea, creatinine level and eGFR did not change significantly.

An important aspect of the preparatory period was dietary treatment, taking into account corrected energy and protein requirements compared to patients without chronic kidney disease. The indications of our centre were: protein requirement at least 1 g/kg of adjusted ideal body weight/24 h, energy requirement 35 kcal/kg of adjusted ideal body weight/24 h. Albumin level should be within the reference values for the local laboratory.

Further bariatric follow-up visits were scheduled at 6 and 12 months after surgery and then once a year. Recommended timing of kidney transplant was at least 1 year after bariatric surgery.

All patients underwent transplant consultation and were added to the Poltransplant kidney transplant waiting list.

Table I. Characteristics of patients with chronic kidney disease qualified for bariatric surgery

| No. | Age [years] | Sex | BMI before [kg/m ²] | BMI 1 month after [kg/m ²] | BMI 3 months after [kg/m ²] |
|-----|-------------|-----|---------------------------------|--|---|
| 1 | 61 | M | 40.5 | 35.8 | 30.6 |
| 2 | 49 | F | 42.1 | 38.4 | 34.3 |
| 3 | 55 | F | 37.0 | 32.1 | 28.5 |

Table II. Characteristics of co-morbidities of the patients qualified for bariatric surgery

| No. | Co-morbidities | CRD [years] | Dialysis [years] | Nephropathy type |
|-----|--------------------------------|-------------|------------------|------------------|
| 1 | DMt2, HA, CAD, hyperlipidaemia | 5.5 | 2 | Diabetic |
| 2 | DMt2, HA | 5 | 3 | Diabetic |
| 3 | HA, COPD | 7 | 2 | Hypertensive |

CAD – chronic atrial fibrillation, COPD – chronic obturative pulmonary disease, DMt2 – diabetes mellitus type 2, HA – hypertension

Discussion

A rapid increase of incidence of chronic kidney disease has been observed over the recent years. This is accompanied by an epidemic of obesity. It was demonstrated in several studies that obesity significantly increases (7×) the risk of chronic kidney disease compared to the non-obese and non-overweight population. The influence of metabolic syndrome was widely described in the pathogenesis of cardiovascular complications, but its role in the pathogenesis of kidney diseases seems to be underestimated [4]. Several kidney pathologies are observed in obesity, which is due to combination of hypertension, oxidative stress and inflammation. It is also important that dialysed obese patients (BMI > 35 kg/m²) have lower chances for kidney transplant but also are at higher risk of complications due to the procedure. Cardiovascular complications and mortality are higher than in non-obese transplant recipients [4, 5].

According to Poltransplant data the average time from initiation of dialysis to transplantation is 2 years and 8 months, and the average time from enrolment on the National Waiting List to transplantation is only 7 months. Therefore it takes 2 years for a patient to be qualified for transplantation. Regardless of all the known obstacles this period is too long, as we know that every year of dialysis therapy worsens the prognosis for the patient and the graft survival time after transplantation [6]. Average kidney transplant waiting time according to the Johns Hopkins group is 5 years longer in obese patients, when compared to non-obese. These patients have a 44 times lower chance of receiving a kidney transplant and 8% die while waiting for transplantation [7]. However, obesity is not an absolute contraindication to receiving an organ transplant and the final decision depends on the centre's experience and practice. In Poland some transplant centres set the upper BMI limit at 30 kg/m², others at 35 kg/m² [6].

Dietary treatment and lifestyle modifications often result in failure. This prolongs the kidney transplant waiting time. Additionally, in successful patients a rapid weight regain is observed after transplantation. In such cases transplantation results are comparable to patients who did not reduce weight prior to transplantation [4, 8]. Nevertheless, weight reduction prior to kidney transplantation is not still univocally required. In patients with BMI over 40 kg/m² at-

tempts to reduce weight even by means of bariatric surgery are becoming accepted [9]. Scientific reports are confusing, but there are some data indicating no influence of obesity on patient and graft survival. Obesity is however accompanied by higher morbidity, especially cardiothoracic and infectious complications.

Patients' survival is improved after transplantation, when compared to dialysed patients [10, 11]. It was also demonstrated that kidney transplantation in a group of patients with morbid obesity was related to increased surgical complications and prolonged procedure time and hospital stay compared to patients with normal body weight [5].

It was also demonstrated that in patients with chronic kidney disease undergoing bariatric surgery renal function improves (GFR and 24 h creatinine clearance) [12]. Additionally, in morbidly obese diabetic patients after RYGB, decrease of albuminuria is observed. It correlates with increased peripheral insulin sensitivity and increased concentration of high molecular weight adiponectin [13-15].

In the literature we can also find case reports of patients in whom kidney transplantations were performed, which was followed by a bariatric procedure. No effect of the bariatric procedure on graft survival or increased requirement for immunosuppressive drugs was observed [2]. It seems reasonable however to start with the bariatric procedure and then proceed to kidney transplantation. In such a sequence weight loss and improved metabolic status lead to a decreased complication rate related to the transplant procedure and improved graft survival. Available research including meta-analyses based on large patient populations support bariatric treatment in obese patients with chronic kidney disease as preparation for transplantation [16]. Safety of this kind of treatment was confirmed. The postoperative complication rate and perioperative mortality are comparable to the group of bariatric patients without chronic kidney disease [17, 18].

It seems that patients with BMI < 35 kg/m² should be accepted by transplant centres in Poland for kidney transplantation. Patients with BMI above 35 kg/m² require careful assessment and a tailored approach including bariatric surgery.

Unfortunately, because of the lack of clear standards and lack of knowledge about possibilities of bariatric treatment in this group of patients, this type of approach is very rare. In our centre with 1,000 kid-

ney transplants performed, only these 3 described patients were surgically treated for morbid obesity. We hope that this initiative will be a breakthrough for this group of patients.

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