Reconstruction of Multiple Renal Arteries During Simultaneous Pancreas and Kidney Transplantation: A Case Report

A. Surowiecka-Pastewka[a,b,*], M. Matejak-Górska[a], M. Frączek[c,d], and M. Durlik[a,c]

[a]Department of Gastroenterological Surgery and Transplantation, Central Clinical Hospital of the Ministry of the Interior, Warsaw, Poland; [b]Mossakowski Medical Research Centre, Polish Academy of Sciences Department of Surgical Research and Transplantology, Pawinskiego, Warsaw, Poland; [c]Diagnostic Radiology Department, Central Clinical Hospital of the Ministry of the Interior, Warsaw, Poland; and [d]Medical Centre of Postgraduate Education, Warsaw, Poland

ABSTRACT

We present a case of a multiple renal artery reconstruction during simultaneous pancreas and kidney transplantation. The kidney graft had 6 renal arteries, the aorta patch was 10 cm long, and there were two renal veins. To perform anastomoses to the left external iliac vessels we had to reconstruct the renal arterial and venal patches. The results of the transplantation were very good. Both grafts had satisfactory function, even though a control computed tomography performed a year after transplantation revealed infarction of a lower renal pole. Anatomical anomalies should not be a contraindication for transplantation, although transplants involving a multiplicity of vessels is a challenge for surgeons and requires both knowledge and microsurgical skills.

MULTIPLE RENAL ABNORMALITIES (MRAs) are the most common graft abnormality and are detected in 20–30% of donors [1,2]. MRAs are most often duplicated unilateral arterial systems, but in 10% they can be bilateral [3].

Multiple arterial systems present a higher risk of operative complications, such as bleeding and leaks, but there is no difference in the long-term observation of kidney graft function [1].

At our center, during a simultaneous pancreas and kidney transplantation (SPK), we start the surgery from the pancreas and then transplant the kidney graft into the retroperitoneal space using the same median incision. During surgery, we usually perform 4 arterial and 3 venous anastomoses. In almost all cases, we use the left kidney, as it has a longer renal vein and does not require vascular reconstructions. We perform end-to-side anastomoses between the graft vessels and the recipient's left external iliac vein and artery. We use the MacKinnon method for uretero-vesical anastomosis, and implement double-J stents only in exceptional situations.

RESULTS

In the reported case, we performed an SPK on 32-year-old male recipient with diabetes diagnosed 25 years ago and who had been receiving renal replacement therapy since 2013 (over 3 years HD). For the induction, we administrated polyclonal antibodies (1.5 mg/kg of body weight daily in 5 doses for a cumulative dose of 6 mg/kg). The donor organs required more anastomoses than in a routine procedure. The kidney graft had 2 renal veins and 6 renal arteries on one 10 cm patch.

As a first step, on the back table we reconstructed the pancreas vessels using a routine technique. A Y-graft from the donor's iliac artery was anastomosed to the graft's supra mesenteric and splenic arteries. The portal vein was then elongated with a graft from the donor's common iliac vein.

Afterwards, we started preparing the kidney graft. The donor's aorta patch in the kidney graft was 10 cm and had 6 renal arteries ostia (Fig 1A). We divided the arteries' patches and performed 5 side-to-side anastomoses, reconstructing the arterial patch (Fig 1B). The result of the reconstruction a was shorter arterial patch. The renal vein reconstructions were done by creating a common trunk (side-to-side anastomosis). The reconstructed vessels were engrafted using a typical method (Fig 1C).

*Address correspondence to Agnieszka Surowiecka-Pastewka, MD, PhD, Department of Gastroenterological Surgery and Transplantation, Central Clinical Hospital of the Ministry of the Interior in Warsaw, Woloska 137, 02-507 Warsaw, Poland. Phone: +48 604 944 236; Fax: +48 22 508 12 66. E-mail: agnieszkasurowiecka@op.pl

0041-1345/18
https://doi.org/10.1016/j.transproceed.2018.02.101

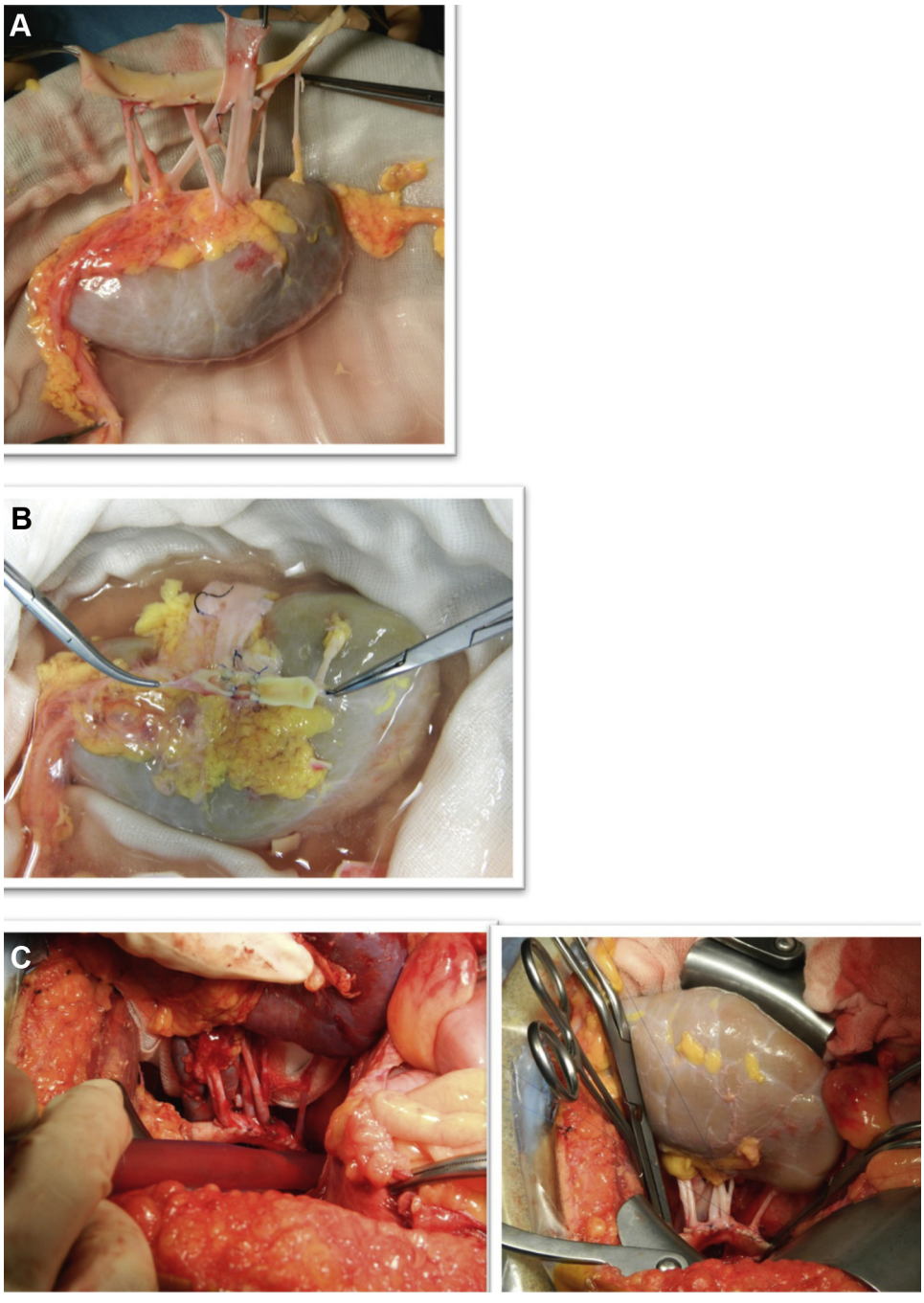

Fig 1. **(A)** The kidney graft before arterial reconstruction. A long aorta patch with 6 renal arteries visible. **(B)** The kidney graft during reconstruction. Five side-to side arterial anastomoses were performed. **(C)** A view after reconstruction and grafting to left external iliac vessels of the recipient.

We used a single median incision and engrafted the pancreas graft first. We performed duodeno-duodenal anastomosis and sutured the graft's vessels to the right external iliac artery and the left common iliac vein of the recipient. We then transplanted the kidney graft to left external iliac vessels to the retroperitoneal space behind the left iliac vessels. We used the MacKinnon method for the uretero-vesical anastomosis, without stenting the ureter.

The blood loss during the surgery was 400 mL, and the patient required a blood transfusion during the procedure. We did not observe any further surgical complications. The grafts' function was very good.