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Combined pancreatic and kidney transplantation: en bloc retrieval and transplantation – a new surgical technique

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Abstract We designed and performed on two patients a new surgical procedure of en bloc kidney and pancreatic transplantation. The liver, pancreas and kidneys were removed en bloc in the donor. On the bench, the liver and the left kidney were separated from the bloc, leaving the pancreas and the right kidney for combined kidney and pancreatic transplantation. The portal vein was divided near to the emergence of the splenic vein. The coeliac axis was taken with an aortic patch. The left renal vein was cut at its entrance to the inferior vena cava (IVC) and the left renal artery was taken with an aortic patch. Reconstruction of the pancreatic vessels was performed with a double anastomosis: the portal vein was anastomosed to the hole in the IVC resulting from the section of the left renal vein and the splenic artery was ana-

stomosed to the hole in the aorta resulting from the section of the left renal artery. The proximal ends of the aorta and IVC were closed with running sutures. In the recipient, the iliac vessels on the right side were dissected. Anastomosis of the distal part of the aorta and the IVC was performed with the right iliac vessels. Duodenocystostomy and reimplantation of the ureter were done according to the usual techniques. This new surgical technique allowed an easy vascular reconstruction of the pancreatic vessels. In the recipient, only one side was used for renal and pancreatic transplantation. Moreover, the length of the transplant procedure was significantly reduced.

Key words Pancreatic and kidney transplantation · Surgical technique · Organ procurement
Diabetes type I

Introduction

Surgical techniques of combined pancreatic and kidney transplantation are hampered by several drawbacks. The procedure is long and requires the dissection of the iliac vessels on the left and right sides. Usually, the pancreatic graft is put in the right iliac fossa and the kidney graft occupies the left iliac fossa.

Furthermore, during the harvesting of the organs, liver and pancreatic transplant surgeons both usually request the longest portal vein [1], and the truncus coeliacus also constitutes a source of debate between the two teams. In the case where the liver is harvested with the truncus coeliacus, the splenic artery of the pancreatic graft has to be reconstructed usually by the interposition of the iliac artery [2].

In order to avoid these drawbacks, a new surgical procedure of combined pancreatic and kidney transplantation was designed and performed in two patients.

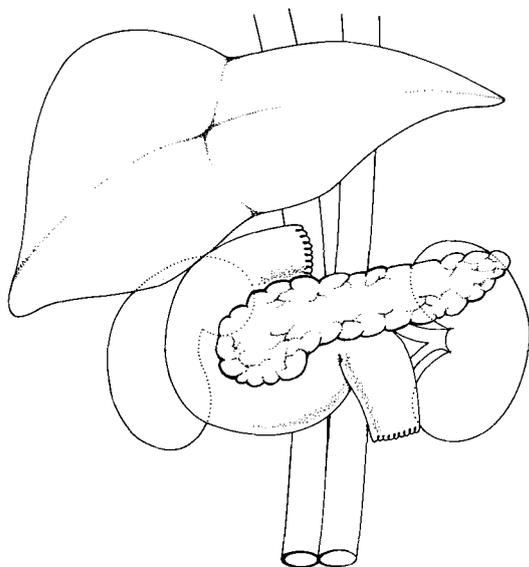


Fig. 1 The "en bloc" removal of the liver, duodenum pancreas and kidneys with the vasculature of the different organs attached to the aorta and the inferior vena cava

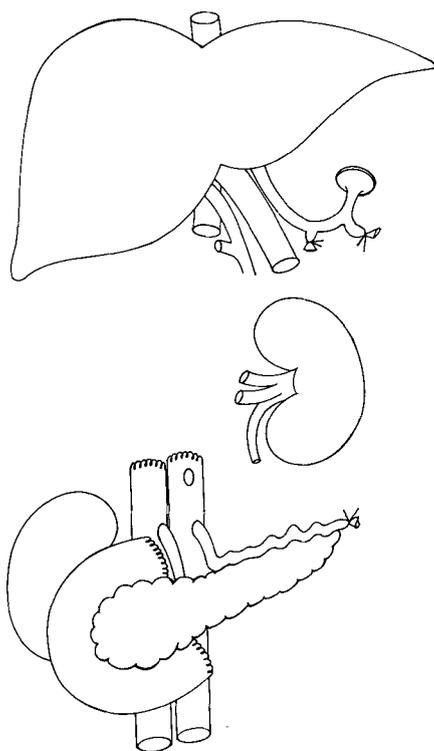


Fig. 2 Bench surgery. The liver and left kidney were removed from the bloc

Method

Harvesting procedure

The harvesting procedure consisted of the "en bloc" removal of the liver, duodenum, pancreas and kidneys with the vasculature of the different organs attached to the aorta and the inferior vena cava (Fig. 1).

Bench surgery

On the bench, the liver was separated from the bloc. The truncus coeliacus was cut with a small aortic patch. The portal vein was cut approximately 1 cm above the confluence of the splenic vein. The left kidney was also removed from the bloc leaving in the aorta and in the inferior vena cava two holes corresponding, respectively, to the emergence of the left renal artery and the left renal vein (Fig. 2).

After removal of the liver and the left kidney, reconstruction of the pancreatic vessels was performed with two anastomoses: the portal vein was anastomosed to the hole in the inferior vena cava resulting from the section of the left renal vein and the splenic artery was anastomosed to the hole in the aorta resulting from the section of the left renal artery (Fig. 3). The proximal ends of the aorta and

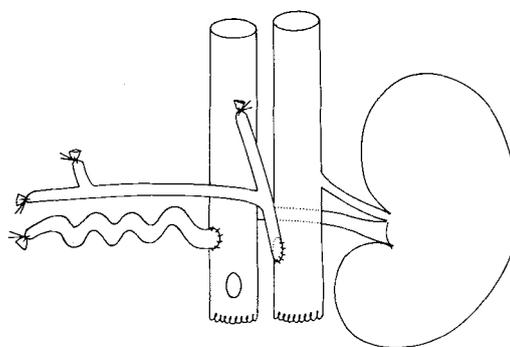


Fig. 3 Bench surgery. The pancreatic vessels were reconstructed

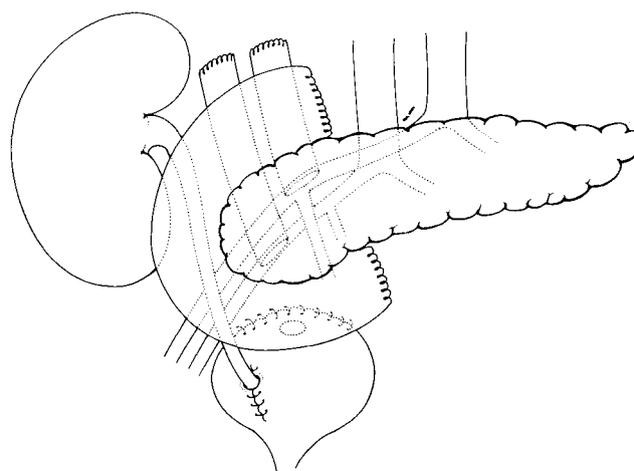


Fig. 4 Combined pancreatic and kidney transplantation in the recipient

inferior vena cava were closed with running sutures. All the collaterals of the aorta and the inferior vena cava that had been cut during the harvesting procedure were ligated.

Combined pancreatic and kidney transplantation

In the recipient, the iliac vessels on the right side were dissected. Anastomosis of the distal part of the aorta and the inferior vena cava were performed with the right iliac vessels. Duodenocystostomy and reimplantation of the ureter were done according to the usual techniques (Fig. 4).

Results

This new surgical technique was used in two patients with chronic renal insufficiency secondary to type I diabetes. Operative time of the transplant procedure did not exceed 4 h.

Unfortunately, the first patient died on postoperative day 7 from a sudden cardiac arrest with functioning

grafts. Postmortem examination was unremarkable at the site of the pancreatic and kidney grafts.

The second patient has been followed for more than 1 year. He is free of insulin and his glycosylated haemoglobin is 5.5% of total haemoglobin. The kidney graft function is good with a creatinine clearance of 70 ml/min.

Conclusion

“En bloc” combined pancreatic and kidney transplantation is a new surgical technique that offers many advantages compared to the usual technique. It permits an easy reconstruction of the pancreatic vessels. It reduces significantly the time of the transplant procedure and requires only the dissection of the right iliac vessels. Finally, the anastomosis to the iliac vessels, especially the venous anastomosis is greatly facilitated.

References

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