

Abdominal Aortic Aneurysm Repair in a Renal Transplant Recipient Using a Femoral V-A Bypass

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We report a successful repair of an abdominal aortic aneurysm (AAA) in a renal transplant recipient using a femoral V-A bypass to protect the renal allograft during aortic cross-clamping. A 49-year-old male patient with renal failure had received a second allogenic renal transplantation in the right iliac fossa in 2002. Four years later, computed tomography showed an enlargement of the AAA extending to the distal aorta with involvement of the common iliac arteries. He received resection and graft replacement of the AAA through a midline laparotomy using a femoral V-A bypass without cold perfusion or local hypothermia. The postoperative course was uneventful, and he was discharged on the 16th postoperative day with no impairment of renal function. To protect the renal allograft injury during aortic cross-clamping, the femoral V-A bypass is an easy and safe method. (Ann Thorac Cardiovasc Surg 2009; 15: 415–417)

Key words: abdominal aortic aneurysm, renal transplantation, femoral V-A bypass

Introduction

Cardiovascular diseases are the main cause of death among renal transplant recipients.^{1,2)} Although current immunosuppressive therapy has increased long-term patient and allograft survival, atherosclerotic disease may be encountered more frequently.

With increasing numbers of renal transplant recipients, the population of patients who require aortic reconstruction surgery also increases as a result of abdominal aortic aneurysm (AAA). During surgical repair of an AAA, concern remains about the possibility of ischemic injury to the transplanted kidney upon the cessation of aortic blood flow. Although relatively good results have been reported using various methods,^{3–9)} safer and easier methods should be prepared to attenuate possible ischemic injury.

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Received December 1, 2008; accepted for publication December 10, 2008

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We report a successful repair of AAA in a renal transplant recipient using a femoral V-A bypass to protect the renal allograft during aortic cross-clamping.

Case

A 49-year-old male patient had renal failure as a result of chronic glomerulonephritis (CGN). In 1986, the patient received a first allogenic renal transplantation in the left iliac fossa. Because he suffered from focal glomerular sclerosis (FGS) and immunoglobulin A nephropathy (IgAN), he received a second allogenic renal transplantation in the right iliac fossa in 2002. An end-to-side anastomosis was performed between the internal iliac artery and the renal artery for the renal allograft.

The postoperative course was uncomplicated, and standard immunosuppressive regimen (tacrolimus hydrate, mycophenolate mofetil, prednisolone) was used. At this time, an AAA had already been detected and observed. Four years later, computed tomography (CT) showed an enlargement of the AAA (52 mm diameter) extending to the distal aorta with involvement of the common iliac arteries (Figs. 1 and 2). He hospitalized our department for the operation.

Resection and graft replacement of the AAA were



Fig. 1. Preoperative computed tomography showed an enlargement of AAA.



Fig. 2. Preoperative computed tomography showed an enlargement of the common iliac arteries and also a transplanted allogeneic kidney in the right iliac fossa.

performed through a midline laparotomy as follows. After systemic anticoagulation (5,000 UI heparin sodium), a femoral V-A bypass was established by means of 19 Fr venous cannula and 22 Fr arterial cannula for the following perfusion of the transplanted kidney. Heparin sodium was given during the procedure to maintain an activated clotting time greater than 250 seconds. With the perfusion assist, an 18 × 9 mm Y-shaped Dacron graft was implanted just proximally to the bilateral internal iliac artery without renal ischemia during 54 min of aortic cross-clamping. Mean perfusion flow of V-A bypass was targeted at 500 ml/min. Cold perfusion or local hypothermia was not used.

Intraoperative and postoperative care included standard intravenous fluid administration, usual monitoring of renal and cardiovascular function, and broad-spectrum antibiotic therapy. Moreover, furosemide was administered adequately to maintain postoperative urinary output of more than 2,500 ml/day.

The postoperative course was uneventful, and the patient was discharged on the 16th postoperative day without impairment of renal function. At the 24-month follow-up, the patient was well and renal function stable.

Comment

An increasing number of renal transplantations is being performed on patients with chronic renal failure.^{1,2)} Because most of them are complicated with risks of developing atherosclerotic vascular disease, such as hyperlipidemia, hypertension, prior hemodialysis, and insulin-dependent diabetes mellitus in combination with

advanced age, the number of occlusive and aneurysmal vascular diseases after kidney transplantation is expected to increase.

In fact, surgical cases of the AAA have been reported in patients with renal transplant history.³⁻⁹⁾ In them, the methods to protect the kidneys from ischemic damage during aortic clamping are the major issue. Some surgeons reported that it is possible to avoid ischemic damage to the transplanted kidney without additional protections during an operation for AAA. In fact, Moon et al.³⁾ reported two cases of AAA repair in patients with renal transplantation without additional operative protection. In contrast with that, Favi et al.⁴⁾ reported two successful cases with cold perfusion and local hypothermia.

There is no doubt that the aortic cross-clamping time must be minimized to prevent ischemic damage to the kidneys. However, unexpected extension of renal ischemia may occur as a result of various factors, including technical problems. In this regard, we believe that any possible modality for renal protection should be prepared in advance.

The establishment of a femoral V-A bypass is not a special or complex method for vascular surgeons. Its use is a safe and certain modality to avoid renal ischemia, regardless of the aortic cross-clamping time.

We experienced the successful repair of an AAA in a renal transplant recipient, using femoral V-A bypass. A femoral V-A bypass is an easy and safe method to protect the renal allograft from ischemic injury during 54 min of aortic cross-clamping. Although we used no cold perfusion or local hypothermia in this case, all of these may be good additives to a femoral V-A bypass.

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