Preparation of Kidney Graft Vessels

**FIGURE 14-8** Venoplasties for right renal vein extension of a cadaveric kidney graft [6–8]. A–C, Use being made of the inferior vena cava. D, Use being made of the external iliac vein of the cadaveric donor.

**FIGURE 14-9** Preparation of the renal allograft with multiple renal arteries [9]. A and B, The use of aortic patches when the kidney is from a cadaveric donor is demonstrated. C and D, The possibilities that exist when an aortic patch is not part of the specimen, such as when the kidney is from a living donor. E, The segmental renal artery also can be anastomosed to the inferior epigastric artery using an end-to-end technique.

The Kidney Transplantation Operation

**DIVISION OF OPERATING ROOM RESPONSIBILITIES FOR RECIPIENTS OF KIDNEY TRANSPLANTATION**

<table>
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<tr>
<th>Anesthesiologist</th>
<th>Surgeon</th>
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<td>Anesthetic induction</td>
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<td>Placement of central venous access line</td>
<td>Bladder catheterization</td>
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After the induction of anesthesia, the anesthesia team places a double- or triple-lumen central venous access catheter, usually via the internal jugular vein. While that is taking place, the surgical team places a retention catheter (usually 20F with a 5-mL balloon), fills the bladder to 30 cm H₂ pressure or 250 mL (whichever occurs first), connects the catheter to a three-way system or clamped urinary drainage system, and places the clamp(s) within reach of the anesthesiologist for control during the operation. The preoperative antibiotic is administered by the anesthesia team. The surgical team shaves both sides of the patient’s abdomen from just above the umbilicus to the distal edge of the mons pubis. The skin is wiped with alcohol, and the nursing team completes the skin preparation. The skin over both iliac fossae is prepared in the event an unexpected vascular contraindication is detected on the chosen side. If immunosuppressant therapy has not been administered, the anesthesiology team begins that protocol.
Adult Recipient

FIGURE 14-11
Surgeon’s view of the right iliac fossa operative site. In this procedure, a 40-year-old man will be receiving his brother’s left kidney, which has a single artery, single vein, and single ureter. The renal vessels will be anastomosed to his right external iliac artery and vein, and urinary tract reconstruction will be by extravesical ureteroneocystostomy [10,11]. The patient is positioned with the head slightly down, supine, and rotated toward the surgeon, who is standing on the patient’s left side.

FIGURE 14-12 (see Color Plate)
Exposure of the right iliac fossa. The contents of the iliac fossa are exposed by incising the skin, subcutaneous tissues, anterior rectus sheath, external and internal oblique muscles, and the transversalis muscle and fascia. The inferior epigastric artery is divided between ligatures, the spermatic cord is preserved (in women, the round ligament is divided between ligatures), and the rectus muscle and peritoneum are retracted medially. This exposes the genitofemoral nerve (white umbilical tape), the external iliac vein (blue tape), and the external and internal iliac arteries (red tapes).

FIGURE 14-13
Determining “best fit.” The kidney graft is placed in the wound and the renal vessels stretched to the recipient vessels to determine the best sites for the arterial and venous anastomoses.

FIGURE 14-14
Isolation of the arteriotomy site. Heparin (30–50 U/kg) is administered intravenously, and vascular clamps are placed on the external iliac artery. The distal clamp is applied first so that the arterial pressure will distend the targeted artery. The external iliac artery is incised longitudinally, the lumen is irrigated with heparinized saline, and fine monofilament vascular sutures are placed in four quadrants to receive the spatulated renal artery. When the recipient artery has significant arteriosclerosis, an endarterectomy can be done or a 5- or 6-mm aortic punch can be used to create a smooth round arteriotomy.
Transplantation as Treatment of End-Stage Renal Disease

**FIGURE 14-15**
Completed end-to-side renal artery-to-external iliac artery anastomosis. Many surgeons perform the arterial anastomosis first because it is smaller than is the venous anastomosis. Thus, the kidney can be moved about more easily to expose the arterial anastomosis when it is not tethered by a previously completed venous anastomosis. An ice-cold electrolyte solution is periodically dripped onto the kidney graft to keep it cold during vascular reconstruction.

**FIGURE 14-16**
Isolation of the right external iliac vein. The kidney is retracted medially, and a segment of the external iliac vein is isolated between Rumel tourniquets. The cephalad tourniquet is applied first so that increased venous pressure will dilate the vein.

**FIGURE 14-17**
Renal vein anastomotic setup. The renal vein is anastomosed to the side of the external iliac vein with the same suture technique that was used for the arterial anastomosis.

**FIGURE 14-18**
Completed venous and arterial anastomoses.