Introduction

Dehiscence of the aortic stump is one of the most common causes of death following aortic prosthetic removal. The reason is easy to understand: the aorto-prosthesis anastomosis performed during the original infrarenal aneurysm repair is usually performed only a few centimetres below the renal artery origins. An end-to-side prosthetic graft for oblitative disease requires an arteriotomy which must not include the inferior mesenteric artery origin and therefore usually starts just below the infrarenal clamp. Cases with an end-to-end anastomosis may permit a longer infrarenal aortic tract. As a consequence, when the original operation has been done properly, a disruption of the aortic wall suture line, destroying at least 0.5 cm of the remaining infrarenal aortic wall, often does not result in sufficient tissue below the renal arteries to allow a technically sound suture of the aortic stump. In most cases it is this mechanical defect more than subsequent infection of the suture line which causes the dehiscence of the aortic stump. Manoeuvres like the use of a flap of the anterior spinous ligament, suggested by Fry and Lindenauer, or mobilisation of a segment of omentum can protect the area from infection but do not ensure the mechanical integrity of the stump. In other words, only those cases in which the original revascularisation procedure has left a long segment of aortic wall will permit a mechanically sound stump closure capable of resisting disruption. A stump closure technique which may avoid dehiscence when there is insufficient infrarenal aorta tissue is here described.

Patients and Methods

Two patients required mandatory resection of an aortobifemoral prosthesis for proximal false aneurysm, severe infection and aortoenteric fistulae (AEF) were operated in 1985 and 1987. In neither of the two cases was an inguinal infection demonstrated. An axillofemoral bypass graft was initially performed, sectioning and pushing the limbs of the old graft into the inguinal tunnel. During the procedure a segment of the great saphenous vein was dissected and preserved. Under general anaesthesia a relaparotomy gave extraperitoneal exposure through a bilateral laterocolic dissection to access the distal part of both renal arteries. After 50 mg heparin administration and clamping, an end-to-side anastomosis was performed between each artery and one of two reversed segments of saphenous vein. At the end of the procedure (15–20 min) the renal artery was declamped after the exclusion of the venous graft, restoring the flow in the native renal arteries. The diaphragmatic aorta was then isolated and cross-clamped and only at this point of the procedure was the huge false aneurysm, AEF and infected area exposed through the usual approach below the mesocolon. The false aneurysm was incised, the third portion of duodenum was transected and covered with sponges, the anastomotic disruption and graft found and the frayed wall of the aorta which was very close to the origin of the renal arteries examined. An aortic occlusion balloon was inserted proximally via the aortic stump to stop back-bleeding from the superior mesenteric artery. After complete removal of the prosthesis, and washing of the infected area with saline and antibiotics, the renal artery origins were identified and cross-clamped. The suprarenal aorta was carefully isolated, after division of the renal artery origins up to the origin of the superior mesenteric artery. The ligation and division of a pair of lumbar arteries permitted its complete mobilisation. The origin of the superior mesenteric artery was exposed and cross-clamped. The aortic balloon was removed and aortic stump sutured with a double suture line, including...
renal artery ostia. The aortic and coeliac artery clamps were removed and an end-to-side anastomosis performed between the proximal end of the left renal saphenous graft and the lateral aspect of the superior mesenteric artery, as close as possible to its origin. The left kidney was at this point temporarily revascularised removing the superior mesenteric artery clamp, to avoid prolonged renal ischaemia and, after 3 min of reperfusion, the bypass was reclamped and a longitudinal incision made through its anteroinferior aspects. The right renal bypass was passed through a tunnel close to the inferior vena cava, below the superior mesenteric artery, and positioned close to the left renal artery bypass incision. Before performing an end-to-side anastomosis between the two vein grafts a Pruitt-Inahara shunt was inserted proximally in the left bypass and distally into the right saphenous bypass in order to perfuse the right kidney for 3 min. After shunt removal, the last anastomosis was performed. At the end of the vascular procedure and a further lavage, the proximal duodenal stump was closed in two layers, pulled and positioned in a sub-hepatic position while the first part of the jejunum was anastomised in Roux-en-y fashion to the second part of the duodenum. At the end of the procedure the aortic stump was covered with great omentum.

Both early and long results were excellent, with survival without aortic stump dehiscence up to 10 and 12 years respectively.

Conclusion

A surgical technique is proposed for avoiding stump blow-out following removal of an infected aorto-femoral prosthesis when an infrarenal two layer suture does not appear sound enough because of insufficient tissue.

References