Aortic Surgery through a Transverse Mini-laparotomy

N. C. Hickey* and S. P. Caldwell

Vascular Surgery Unit, Worcestershire Royal Hospital, Worcester, U.K.

Key Words: Aortic aneurysm repair; Aorto-bifemoral bypass; Mini-laparotomy.

Introduction

Open abdominal aortic aneurysm repair traditionally requires a long incision exacerbating operative morbidity. Endovascular stenting is less invasive but of unproven effectiveness, whilst laparoscopic aortic surgery demands new skills and modification of the standard “Creech” endoaneurysmorrhaphy. Aortic surgery via a small midline incision, however, allows a standard operative technique and is as minimally invasive as either endovascular or laparoscopic repair. We prefer a transverse incision for aortic surgery and have developed a mini-laparotomy transverse approach.

Technical Report

Patients with isolated aortic aneurysms are suitable for this technique. Co-existing iliac aneurysms requiring bifurcated grafts are excluded by CT scanning.

A 10–12 cm transverse incision is made 2 cm above the umbilicus. The anterior and posterior rectus sheaths are divided in line with the incision but the muscle is preserved and retracted (Fig. 1). The omentum and transverse colon are pushed cephaled over the stomach. The small bowel is packed off within the abdominal cavity with large abdominal mops. Omni-Tract (Minnesota Scientific, U.S.A.) blades are inserted into the wound, pulling the recti laterally and exposing the aneurysm.

Dissection of the sac is performed using conventional instruments. A third blade is inserted proximally and the wound retracted firmly to allow dissection of the aneurysm neck. This blade is loosened, a similar one inserted inferiorly and again retracted firmly to complete dissection of the aneurysm and common iliac artery origins. The iliacs are controlled using either conventional clamps inserted via separate “stab” incisions or (preferably) with flexible Cosgrove (Alliance Health Care, U.S.A.) clamps brought out through the main wound. The distal blade is loosened and the aneurysm neck exposed once again and clamped using a Cosgrove aortic clamp (Fig. 2).

The sac is then opened and a standard Creech endoaneurysmorrhaphy is performed, the top and bottom ends being exposed by firm retraction on the proximal or distal Omni-Tract blades. The sac is closed around the graft as usual and the incision closed in layers. In obese patients the incision may be extended and muscle divided to improve access.

* Please address all correspondence to: N. C. Hickey, Consultant Vascular Surgeon, Worcestershire Royal Hospital, Charles Hastings Way, Worcester WR5 1DD, U.K.
This approach is also ideal for aorto-bifemoral bypass for occlusive disease. The small transverse incision is made over the anticipated site of the proximal anastomosis, allowing end-to-end or end-to-side anastomoses as required.

All aortic surgery (apart from repair of aorto-iliac aneurysms) over one year was performed using this technique. Thus a consecutive, unselected series of 21 aneurysm repairs have been performed. Median (range) age was 73 years (61–82), weight was 81 kg (65–110) and aneurysm diameter 6.1 cm (5.5–7.9). Median incision length was 12 cm (10–16), operative time was 122 min (85–190) and hospital stay 6 days (2–55). There was no 30-day mortality. Similarly, seven consecutive aorto-bifemoral bypasses have been performed with a median length of stay of 5 days.

Discussion

Our early experience suggests that mini-laparotomy transverse incision aortic surgery is feasible and, unlike hand-assisted or retroperitoneal laparoscopic surgery, requires no special skills or equipment. It appears particularly useful in slim patients with straightforward aneurysms, those with respiratory disease or for aorto-bifemoral bypass for occlusive disease. We advocate caution in attempting very small incisions in the obese or hostile abdomen, but the transverse incision is easily extended. Patients seem to recover more quickly than those operated on via standard incisions, but further study is required to establish definite advantage.

References


Accepted 17 October 2002