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57. *Abdominal Aortic Aneurysm*

FERDINAND F. MC ALLISTER

THE USUAL ABDOMINAL ANEURYSM can be well exposed through a linea alba incision with the patient supine. The incision should be generous, extending from the xiphoid to the pubis. The patient should be prepared well up onto the chest in case it should become necessary to enter the chest for control of the aorta above the level of the renal arteries, and well down to the lower legs in case embolectomy and thrombectomy in the leg vessels should be required.

The transverse colon and entire small bowel are delivered to the outside on the right and placed in a plastic bag or packed in warm, saline-soaked pads. The parietal peritoneum overlying the aneurysm, proximal aorta, and iliac vessels is incised in a vertical plane. The right leaf of the parietal peritoneum is reflected laterally to the right, uncovering the right iliac vessels and ureter, the right wall of the aneurysm, and the vena cava. Separation of the third portion of the duodenum and proximal jejunum from the aneurysm is facilitated by division of the ligament of Treitz (Fig. 1). The left leaf of the parietal peritoneum is now reflected to the left, uncovering the left iliac artery and vein and the left ureter. The dissection is carried superiorly on the left, exposing the inferior mesenteric artery and vein (Fig. 2). The artery is divided between clamps close to the aneurysm and the stumps are doubly tied with 00 silk. The vein is preserved, if possible, but dense adherence to the wall of the aneurysm may require that a section of it be left attached to the aneurysm. The dissection is continued superiorly to expose the aorta proximal to the aneurysm and the left renal vein as it courses to the left anterior to the aorta.

Since it is generally more dangerous to encircle the aorta than the iliac arteries, the usual vascular principle of securing proximal arterial control first may be varied at this point and attention turned to the iliacs. The iliac arteries are carefully inspected throughout their courses, and favorable sites are selected for grafting. It is desirable to spare the internal iliacs if possible, both to maintain adequate circulation to the rectosigmoid colon and also to preserve sexual potency. One should, however, select a site that will permit a good vascular anastomosis and insure good runoff even if it entails sacrificing the internal iliac. If the aneurysmal dilatation extends distally to include the common iliac artery bifurcation, there is little choice but to use the external iliac. If the latter is badly diseased and markedly stenotic,

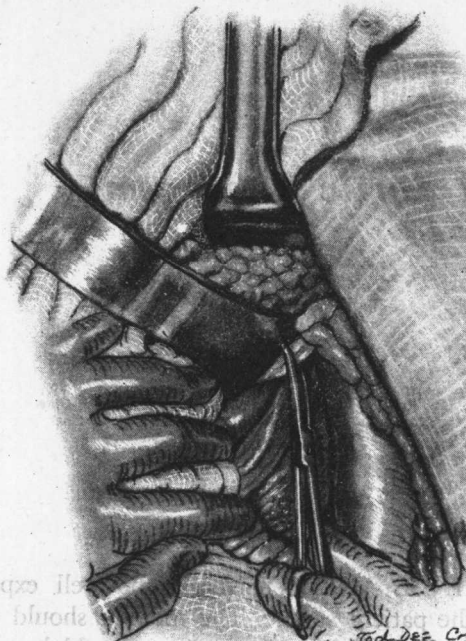


FIGURE 1. The small intestine has been delivered to the outside on the right and packed in warm, saline-soaked pads. The parietal peritoneum has been incised over the aorta, and the ligament of Treitz is being cut to facilitate exposure of the proximal aorta.

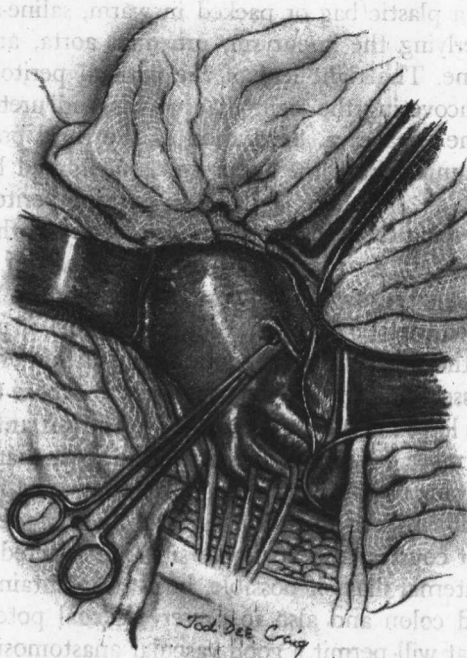


FIGURE 2. The right internal and external iliac arteries have been mobilized and encircled with tapes. The inferior mesenteric artery is being dissected out close to its origin from the aneurysm preparatory to division and ligation.

it may even be necessary to prepare a tunnel beneath the inguinal ligament and use the common femoral artery. At whatever site is selected, the artery on each side is carefully dissected out and encircled with a tape. If the site is beyond the origin of the internal iliac artery, this artery is isolated and tied off with 00 silk.

Before dissecting around the aorta it is well to select a prosthesis of suitable size and, if it is of the more porous type, to withdraw 50 cc. of blood from the inferior vena cava and instill it into the prosthesis for preclotting.

Next, a plane is developed between the inferior vena cava and the aorta in the space just below the takeoff of the left renal vein and just above the aneurysm. By staying close to the aortic wall, a plane will be found which will carry the operator down to the anterior vertebral body. A similar plane is then developed on the opposite side, again staying close to the aorta. Here, one must be careful to avoid rupturing the left ovarian or spermatic vein, a tear of which may be troublesome. If the spermatic vein is near the plane of dissection, the best course is to control it early by division and ligation. Another vein which may be troublesome in this dissection, because of the danger of injuring it, is the occasional double left renal vein with one channel running deep to the aorta. With the proper plane developed on either side, it is possible for the operator to pass his finger behind the aorta (Fig. 3) so as to allow the encirclement of this vessel with a tape. If the operator keeps his fingernail pressed against the anterior vertebral body and gently sweeps the finger back and forth, this dissection is usually safe.

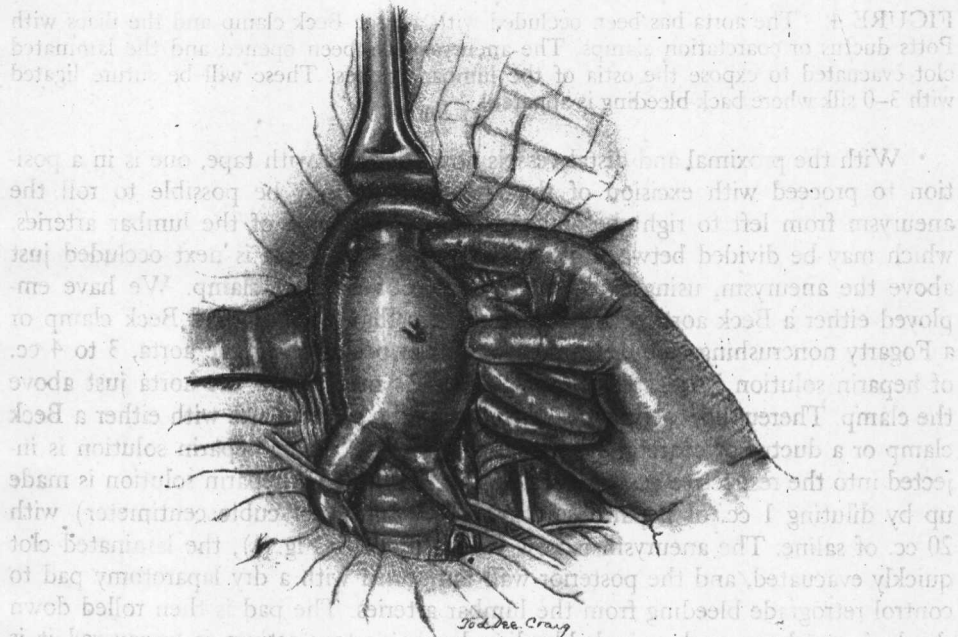


FIGURE 3: The iliacs have been controlled with tapes and the inferior mesenteric artery has been divided. A plane is being developed with finger dissection around the aorta immediately proximal to the aneurysm but below the renal arteries and the left renal vein. The vena cava is adherent to the aneurysm.

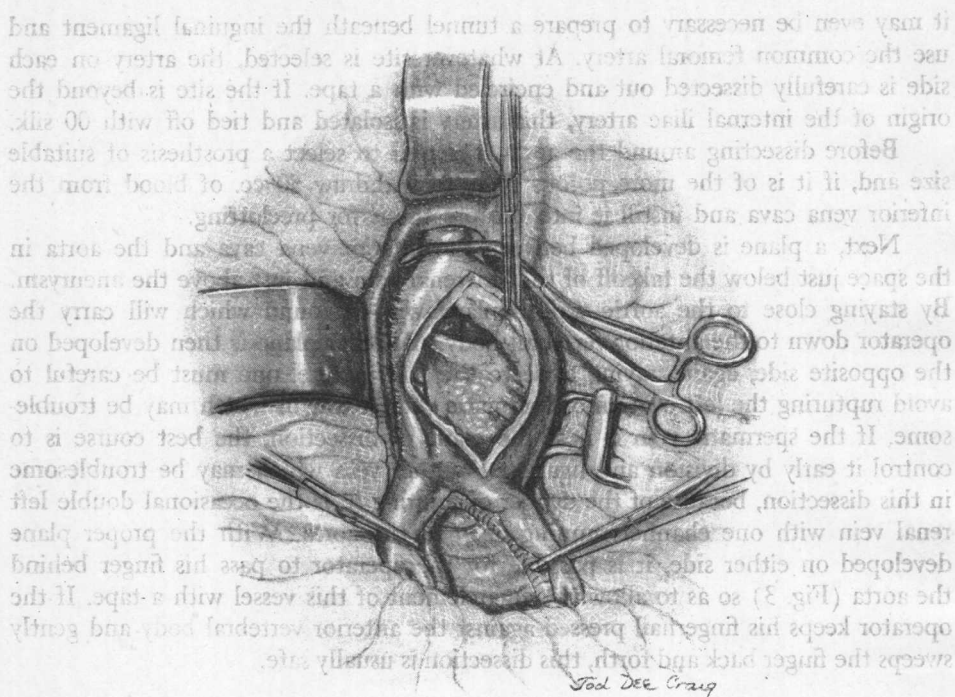


FIGURE 4. The aorta has been occluded with a large Beck clamp and the iliacs with Potts ductus or coarctation clamps. The aneurysm has been opened and the laminated clot evacuated to expose the ostia of the lumbar arteries. These will be suture ligated with 3-0 silk where back-bleeding is apparent.

With the proximal and distal vessels now encircled with tape, one is in a position to proceed with excision of the aneurysm. It may be possible to roll the aneurysm from left to right beforehand and expose some of the lumbar arteries, which may be divided between clamps and tied. The aorta is next occluded just above the aneurysm, using some modern type of vascular clamp. We have employed either a Beck aortic clamp of larger size than the standard Beck clamp or a Fogarty noncrushing clamp. Immediately after occlusion of the aorta, 3 to 4 cc. of heparin solution is injected through a No. 21 needle into the aorta just above the clamp. Thereupon, each iliac is occluded at the selected site with either a Beck clamp or a ductus or coarctation clamp; again 3 to 4 cc. of heparin solution is injected into the respective vessels distal to the clamps. The heparin solution is made up by diluting 1 cc. of heparin solution (1000 units per cubic centimeter) with 20 cc. of saline. The aneurysm is now widely incised (Fig. 4), the laminated clot quickly evacuated, and the posterior wall tamponed with a dry laparotomy pad to control retrograde bleeding from the lumbar arteries. The pad is then rolled down slowly from above, and as each bleeding lumbar artery ostium is uncovered it is controlled with suture ligatures of 3-0 silk. When hemostasis has been secured the excess anterior aneurysm wall is excised and the proximal aortic stump is cleanly defined. The vessel ends are flushed with heparin solution.