

Side-to-side aorto-mesenteric anastomosis for management of abdominal angina

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Abdominal angina and fear of eating are manifestations of mesenteric ischemia. This infrequent cause of abdominal pain was diagnosed in a 60-year-old female smoker. We performed a novel side-to-side aorto-mesenteric anastomosis for mesenteric revascularization, with good short-term (6 months) result. [*Indian J Gastroenterol* 2005;24:256-257]

The clinical hallmark of chronic bowel ischemia is postprandial pain or abdominal angina.¹

A 60-year-old lady, a heavy smoker, presented with two-year history of increasing abdominal pain. The pain was brought on by consumption of food, which later led to fear of food and significant weight loss. She had undergone extensive investigations and was on empiric treatment regimes without relief. Color-duplex study performed elsewhere was suggestive of critical superior mesenteric artery (SMA) stenosis.

Mesenteric angiography demonstrated occlusion of the celiac artery at its origin, with critical stenosis of the proximal SMA (Fig). There was poor visualization of the inferior mesenteric artery and mesenteric collaterals. Diffuse atherosclerotic plaques were seen in the infrarenal aorta and iliac arteries. Percutaneous angioplasty was not considered owing to the ostial location of the SMA lesion with post-stenotic dilatation.

Transperitoneal exposure of juxtarenal aorta and SMA in the base of the mesentery was performed through a midline abdominal incision. After dividing the ligament of Trietz, the duode-

num was mobilized to the right and the pancreas was retracted superiorly to expose the proximal SMA, just beyond the stenosis. Silastic slings were doubly looped around the SMA, while a red rubber catheter was passed around the aorta. After five minutes of intravenous heparinization, a partially occluding Satinsky vascular clamp was applied to the medial wall of the aorta, immediately below the renal artery origin. The posterior origin of the right renal artery facilitated side clamping of the aorta in the juxtarenal region. The SMA was controlled by Potts' loop and a two-cm arteriotomy was made on its lateral wall. An identical sized incision was made on the aorta. Side-to-side anastomosis was performed by continuous sutures of polypropylene 4-0.

Postoperatively, heparin was administered with monitoring of the activated plasma thromboplastin time. The postoperative course was complicated by pneumonia, from which the patient eventually recovered. The bowel function showed smooth recovery. The anastomosis was patent on CT angiography six months later (Fig).

Due to rich compensatory collateral circulation, chronic intestinal ischemia manifests only when at least two of the three main visceral branches are either occluded or have severe stenosis.² Duplex scan serves as a useful noninvasive method for detection of high-grade visceral artery stenosis. However, it is technically demanding and may often be inconclusive owing to depth of vessels, respiratory motion and intra-abdominal gas. Mesenteric angiography with lateral aortic views will reveal ostial stenosis or occlusion of visceral vessels. Demonstration of a meandering artery is a sign of collateralization between the superior and inferior mesenteric territories.²

Minimally invasive percutaneous endovascular treatment is an attractive alternative to surgical reconstruction in these malnourished and debilitated patients.³ Long-term results of mesenteric angioplasty suggest that it may be a safe alternative with reasonable success.³

Surgical revascularization remains the most effective treatment. Infrarenal aorta-to-mesenteric artery bypass using vein or PTFE graft is the most commonly performed operation.⁴ A simpler procedure is direct reimplantation of the SMA on to the infrarenal aorta. However, these methods are not advisable in the presence of severe atherosclerotic disease of the infrarenal aorta. A supraceliac aortic



Fig: Left: CT angiography shows occluded celiac artery (small arrow), with critical stenosis of SMA (bold arrow); also note ragged appearance of infrarenal aorta. Right: Postoperative CT angiography shows patent aorto-mesenteric anastomosis (small double arrows) distal to the SMA origin, denoted by bold double arrows

graft origin is recommended in such circumstances.⁵ The potential disadvantages with this approach include proximal aortic clamping with resultant renal ischemia.

Our approach is based on the principle that the inflow site for anastomosis must be in a healthy segment of the aorta to avoid bypass failure. The infrarenal aorta was not utilized owing to atherosclerotic lesions. The juxta- and suprarenal aortic segments were relatively spared of disease. We opted for a direct side-to-side anastomosis of the SMA with the juxtarenal aorta as it would avert renal ischemia and also avoid the use of a graft, which is prone to kink at this location. A side clamp of the aorta during side-to-side aorto-mesenteric anastomosis maintains renal perfusion throughout the procedure. Such an anastomotic configuration also avoids the possibility of graft twisting.

In conclusion, side-to-side aorto-mesenteric anastomosis is a novel and useful method of visceral revascularization in severely atherosclerotic infrarenal aorta. Endovascular techniques can be considered

in high-risk symptomatic patients with a suitable stenosis.

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