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# Concomitant Treatment of Several Visceral and Renal Artery Pathologies during Open Abdominal Aortic Aneurysm Repair

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Abdominal aortic aneurysm (AAA) infrequently co-exists with visceral/renal artery pathologies needing concomitant treatment, where a higher technical complexity and a higher risk for morbidity/mortality are anticipated [1,2]. A 77-year-old male patient underwent computed tomography for weight loss and postprandial pain presenting a 65-mm infrarenal AAA, 35-mm right common iliac aneurysm, left internal iliac artery occlusion, 35-mm right renal artery aneurysm (RAA), occluded superior mesenteric artery (SMA), occluded left renal artery and median arcuate ligament syndrome (Fig. 1). He was scheduled for surgical repair.

Through a midline incision the abdominal aorta was approached from its supraceliac segment to the iliac bifurcations using a transperitoneal retropancreatic approach (Fig. 2) [3]. Median arcuate ligament compressing the celiac artery was released. Applying supramesenteric cross-

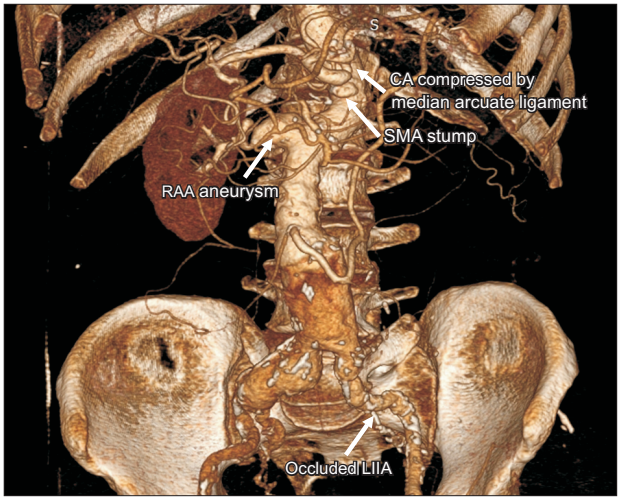


**Fig. 1.** Three-dimensional reconstruction of computed tomography images demonstrated the AAA and concomitant visceral and renal disease. CA, celiac artery; SMA, superior mesenteric artery; RAA, renal artery aneurysm; LIIA, left internal iliac artery.

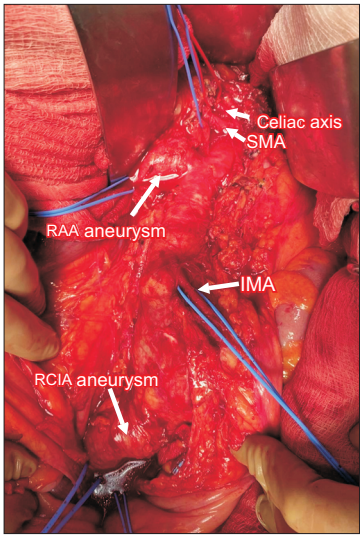


**Fig. 2.** Intraoperative photograph before the vascular reconstruction. The left renal artery is occluded, while the left renal vein has been divided to gain additional exposure. SMA, superior mesenteric artery; RAA, renal artery aneurysm; IMA, inferior mesenteric artery; RCIA, right common iliac artery.

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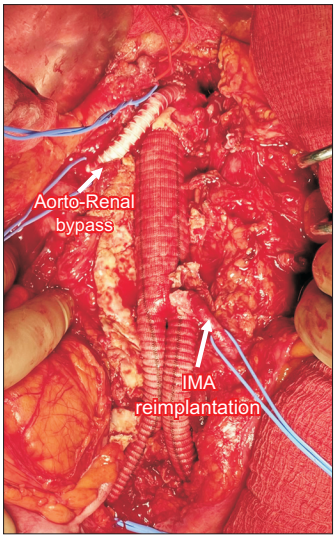


**Fig. 3.** Intraoperative photograph after celiac artery decompression, aorto-renal bypass, aorto-bi-iliac bypass and inferior mesenteric artery (IMA) reimplantation.


**Fig. 4.** Intraoperative photograph after the last step of the procedure, which was revascularization of the superior mesenteric artery (SMA), with an externally supported ePTFE graft.

clamping [3], the right RAA was excised and a bypass from the native suprarenal aorta to the right renal artery lateral to inferior vena cava was performed. This was prioritized to aortic reconstruction to reduce renal ischemic time (19 minutes) [4]. The aortic clamp was then positioned distal to the aorto-renal graft and a bifurcated aorto-bi-iliac (right

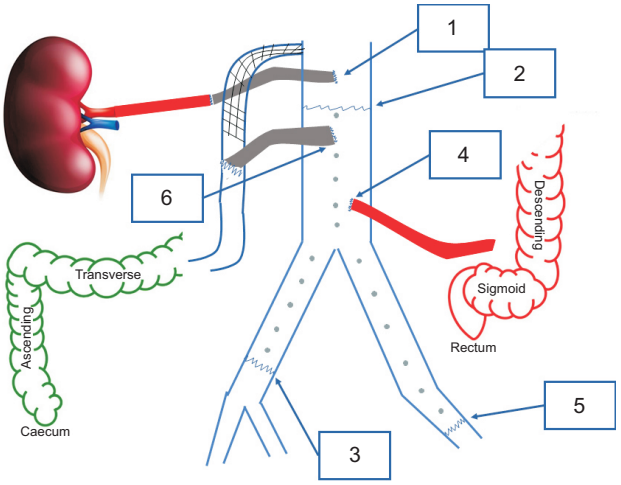


**Fig. 5.** Animation showed the postoperative anatomy. Number in the boxes indicate the surgical sequence: 1, aorto-renal bypass; 2, proximal anastomosis of the bifurcated aortic graft; 3, distal anastomosis of the bifurcated graft to the right side to perfuse the right lower limb and the right internal iliac artery; 4, re-implantation of the inferior mesenteric artery; 5, distal anastomosis of the aortic graft to the left external iliac artery (occluded left internal iliac); 6, bypass from the aortic graft to the superior mesenteric artery.

common and left external iliac artery) graft was inserted. The inferior mesenteric artery (IMA) was re-implanted in the aortic graft (Fig. 3). Following, a bypass from the aortic graft to the SMA ~4 cm distal to its origin was performed (Fig. 4, 5).

The procedure though lengthy (6.5 hours, transfusion of 4 units of red blood cells) was uneventful. The patient was transferred in the intensive care unit taking vasoconstrictive support. The 3rd postoperative day he deteriorated and an exploratory laparotomy was performed indicating occluded IMA, patent SMA graft and intestinal necrosis. Subtotal colectomy was performed, but unfortunately he died the next day. Redistributive shock, high doses of hemodynamic support and inadvertent division of critical collaterals were considered as possible causes for bowel necrosis. Retrospectively evaluating this case, we consider that a different surgical approach with supraceliac-SMA-right renal bifurcated bypass first followed by aorto-bi-iliac interposition could be appropriate, while a lower threshold for 2nd-look operation could have resulted in an earlier diagnosis which is important to optimize prognosis after intestinal necrosis.

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