



# Extra-Anatomic Bypass from Ascending Thoracic Aorta to Abdominal Aorta in Takayasu Arteritis with Middle Aortic Syndrome

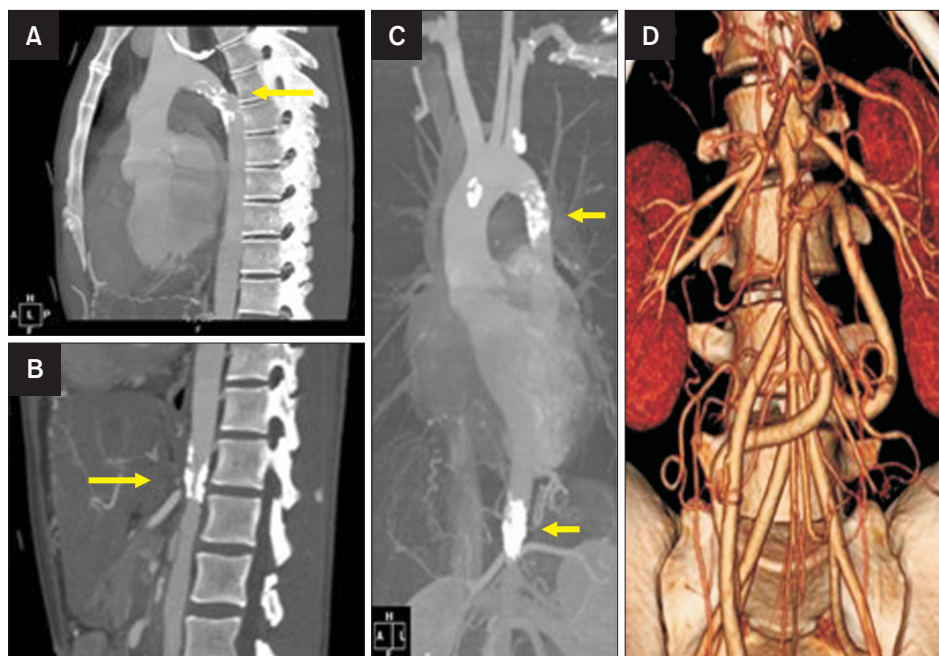
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Middle aortic syndrome (MAS) is a rare disease causing steno-occlusion of mid-aorta (descending thoracic to abdominal aorta) due to Takayasu arteritis (TAK) [1]. Extra-anatomic ascending aorto-abdominal aortic bypass with a prosthetic graft has been reported for the treatment of MAS with TAK [2]. We suggest a new graft pathway through which graft passes posterior to liver left lobe, through lesser

sac, to prevent bowel contact which might cause aorto-enteric erosion or fistula [3].

A 23-year-old male was referred to vascular clinic due to uncontrolled hypertension. At the age of 3, he had hypertension due to both renal artery stenoses due to TAK. Repeated angioplasties of renal arteries and aorta were performed, however, despite of multiple medications, hy-



**Fig. 1.** Computed tomography angiography images. (A) Thoracic aortic coarctation (arrow). (B) Suprarenal aortic stenosis (arrow). (C) Severe multiple calcifications in aorta (arrow). (D) Celiac and superior mesenteric artery ostia occlusion with prominent mesenteric collateral vessels from inferior mesenteric artery.

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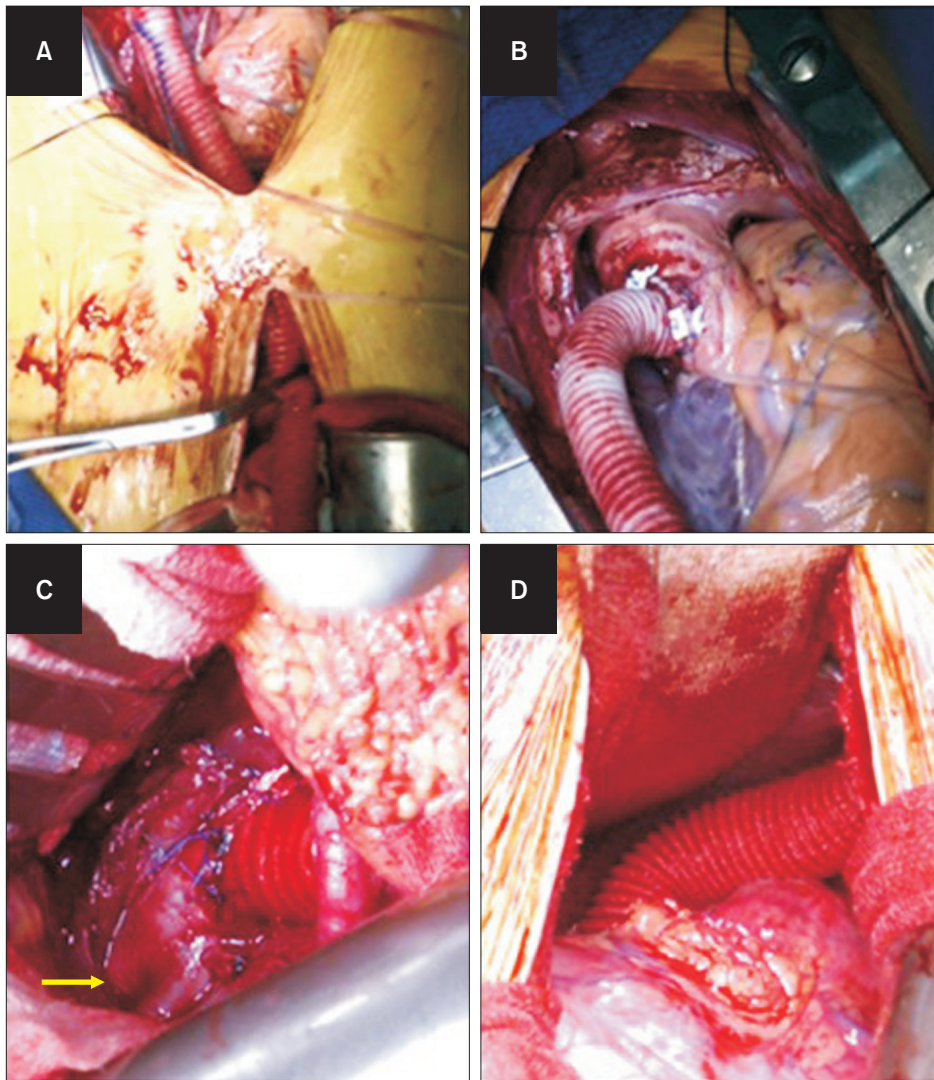
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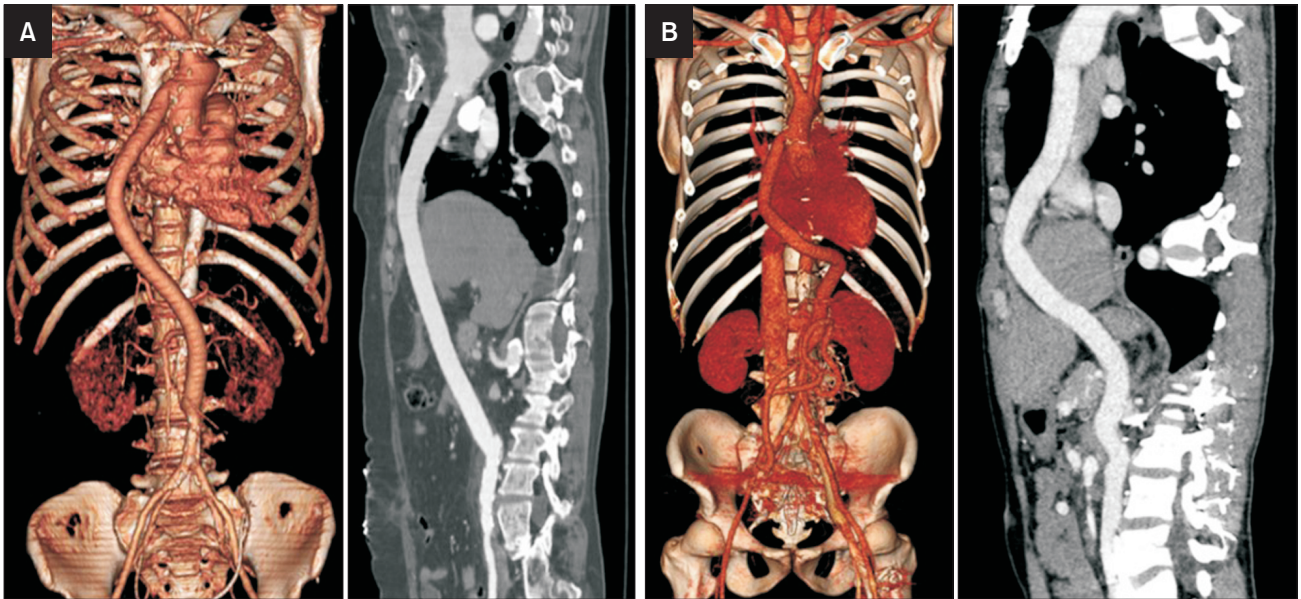


**Fig. 2.** Operative pictures. (A) Sternotomy and abdominal upper midline incision. (B) The inflow from the proximal ascending aorta. (C) Outflow to the infrarenal aorta. Arrow indicates the enlarged inferior mesenteric artery due to severe stenosis in the celiac axis and superior mesenteric artery. (D) The prosthetic graft coursed below the sternum, penetrating diaphragm, under the left liver, passing through the lesser sac, behind the pancreas, and finally to the infrarenal aorta to avoid contact with any bowels.

pertension was uncontrolled [4]. Computed tomography revealed multiple calcifications from descending thoracic aorta to suprarenal abdominal aorta with occlusion of the celiac axis and superior mesenteric artery with collateral supply from the inferior mesenteric artery, and focal aneurysmal dilatation of the left renal artery (Fig. 1).

An extra-anatomic bypass from the ascending aorta to the infrarenal aorta with a 14-mm Dacron graft was performed via a sternotomy and abdominal upper midline incision. The graft originated from the ascending aorta, tunneled posterior to the sternum, through the mid-anterior portion of the diaphragm, posterior to left lobe of the liver after dissection of left triangular ligament, through the lesser sac, behind the stomach and pancreas, and finally to

the retroperitoneal infrarenal aorta just above the inferior mesenteric artery. The graft was covered with pericardium as much as possible to avoid graft exposure, and distal part passing outside the pericardium was covered with pleural fat. Intraoperative Doppler ultrasonography confirmed adequate graft perfusion. The graft was covered with omentum to separate the graft from the duodenum (Fig. 2). Postoperative computed tomography angiography showed good perfusion of the graft and aortic branches. Reconstructive images show the pathway tunneled away from the bowel (Fig. 3). The patient recovered without any complications and the blood pressure returned to normal without any antihypertensive drugs.



**Fig. 3.** Comparative postoperative reconstructed computed tomography images of the graft courses. (A) Previous literature from reference 2. (B) Our method.

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