Case Reports

How to manage a case of asymptomatic thoraco-abdominal aortic aneurysm with occluded mesenteric arteries

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ABSTRACT

We report a unique case of a 57-year-old male having a suprarenal thoraco-abdominal aortic aneurysm which is extending till the origin of superior mesenteric artery (SMA). The origins of celiac artery and SMA were totally occluded and filled retrogradely through dense collateral vessels arising from the inferior mesenteric artery. Surprisingly, the patient was not having any symptoms related to mesenteric ischemia. We decided to use a conventional aortic aneurysm stent graft to repair it without revascularizing the occluded mesenteric arteries. After 1 month, CT aortogram was repeated which revealed a well-apposed stent graft with no endoleaks. He did not have any clinical signs and symptoms attributable to mesenteric ischemia.

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1. Introduction

Thoraco-abdominal aortic aneurysms are usually associated with variable degree of stenosis or occlusion of the origins of important branch arteries. If the patient is exhibiting signs and symptoms of malperfusion like mesenteric ischemia, then it is usually recommended to revascularize the respective branch arteries before or during the repair of aortic aneurysm. In asymptomatic patients however, the line of management is still controversial. In this article, we aim to discuss a similar case and how we managed it.

2. Case report

A 57-year-old male was diagnosed to have an abdominal aortic aneurysm after an ultrasound (USG) abdomen was done for an unrelated event. He is a known case of diabetes mellitus and hypertension since last 10 years. He underwent a CT aortogram, which confirmed the presence of a suprarenal thoraco-abdominal aortic aneurysm of length 11 cm and width 9.9 cm (Fig. 1). The origins of the celiac artery (CA) and superior mesenteric artery (SMA) were totally occluded (Fig. 2) and filling retrogradely through extensive collateral vessels arising from the inferior mesenteric artery (IMA). There were no significant lesions present in the lumen of IMA.

Surprisingly, the patient did not have any symptoms of chronic mesenteric ischemia like post-prandial abdominal pain, weight loss, fear of eating, nausea and vomiting, or change in bowel habits. This can be taken as an indirect indication of the adequacy of the collateral supply to the occluded CA and SMA.

We discussed the case with the 'Heart team' and decided to proceed with endovascular repair of the aneurysm (EVAR). It was a matter of debate whether to revascularize the occluded...
mesenteric arteries before doing EVAR. Since the collateral circulation was well developed and the patient was asymptomatic, we decided not to do any additional procedures to revascularize the occluded mesenteric arteries. EVAR was done using a conventional self-expanding stent (Valiant Captivia, Medtronic). The diameter of the stent graft was 36/32 mm (upper end/lower end diameter) and length was 15 cm. The procedure was done successfully under general anesthesia. The postoperative angiogram showed a well-apposed stent graft with no endoleaks (Fig. 3). The femoral artery was also successfully repaired, as confirmed in the postoperative angiogram.

The patient came for his first follow-up visit after 1 month. He is completely asymptomatic with no signs of mesenteric ischemia. A CT aortogram was repeated which showed a normally functioning aortic stent graft (Fig. 4).

EVAR is now the treatment of choice for aortic aneurysms with suitable anatomy. This has been proven abundantly in registry and randomized trials, especially for infra-renal and descending thoracic aortic aneurysms. In cases of thoraco-abdominal aortic aneurysms, the line of management is still controversial. This is predominantly because of the visceral branches arising from aorta which need to be protected. For this reason, we have to use custom-made branched or fenestrated stent grafts or the ‘chimney technique’ during endovascular repair. Alternatively, hybrid procedures can be used which include creating bypass grafts to secure the side branch vessels prior to the EVAR procedure.

Fenestrated and branched endografts are stents that have reinforced openings (fenestrations) or branches that maintain the patency of the important visceral arteries. They are increasingly being used to treat abdominal aortic aneurysms, as outcomes appear favorable when compared with open

Fig. 1 – CT aortogram showing thoraco-abdominal aortic aneurysm.

Fig. 2 – Axial image of CT aortogram showing total occlusion of the origin of superior mesenteric artery.

Fig. 3 – Postoperative aortogram showing a well-apposed aortic graft stent with no endoleaks.

Fig. 4 – 1-month follow-up CT aortogram showing a normally functioning stent graft with complete exclusion of the aneurysmal sac and preserved flow in visceral arteries.

3. Discussion
surgery. However, there are limitations of this new technique, including high treatment costs, delay in manufacturing a custom made device, availability, and complexity. Accurate determination of visceral branch orientation (clock face position or orientation angle) is essential to obtain a satisfactory result. The success of the techniques depends critically upon appropriate sizing of the stent-graft to ensure aneurysm exclusion and maintenance of visceral branch perfusion. This process is labor-intensive and has in the majority of cases been performed by the manufacturer in a centralized planning facility. These issues contribute to the expense of the technique, treatment delay, and potentially limit its more widespread application. There is a higher incidence of immediate and long-term complications associated with the use of fenestrated stent grafts as compared to the conventional stent grafts.

The randomized trials like EVAR – 1, OVER, and DREAM trials compared open surgical repair with EVAR. The major conclusions of these trials were that there is lower operative mortality, faster recovery, and lower incidence of paraplegia with EVAR. The rate of re-intervention was however found to be higher with EVAR predominantly because of stent graft failure. The long-term results from the OVER trial suggested a mortality ‘catch-up’ in the EVAR group after 3 years.

Mesenteric artery revascularization is indicated in patients who have signs and symptoms attributable to mesenteric ischemia. The patient in our case was completely asymptomatic, which was probably an indirect indicator of adequate collateral supply. For this reason, we did not plan to revascularize the chronically occluded mesenteric arteries before doing EVAR. The ‘natural bypass’ created by the collateral arteries, simplified the line of management of the patient. We used the conventional stent graft instead of the fenestrated stent grafts for EVAR. It reduced the operation time, cost of the procedure as well as the risk of complications associated with the hybrid procedures and fenestrated stent grafts.

This is a unique case due to two reasons. First, it is rare for a patient to be asymptomatic despite a completely occluded CA and SMA. Second, to our knowledge, such a case has not been reported where a conventional stent graft was deployed across a thoraco-abdominal aortic aneurysm without attempting to revascularize the mesenteric arteries (especially SMA).

Conflicts of interest

The author has none to declare.

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