SHORT REPORT

Emergency Repair of Type IV Thoracoabdominal Aneurysm with the Use of a Singular Shunt to Maintain Visceral Perfusion

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Introduction

Surgical intervention for thoracoabdominal aneurysm (TAA) is associated with a high rate of perioperative complications arising from visceral and/or distal hypoperfusion. Despite a variety of intraoperative strategies reported in the literature, there is a lack of an effective procedure that provides a quick method to maintain visceral perfusion during TAA repair, particularly in emergency cases. In this report, we present a patient with a ruptured type IV TAA, who had previously undergone infrarenal aortic repair in a different hospital and subsequently, because of a prosthetic infection, graft removal and axillobifemoral bypass.

In this particular case, visceral and renal perfusion has been supported with a singular shunt realized simply during operation and inserted in axillobifemoral bypass.

Technical Report

A 78-year-old female was admitted in our hospital with a ruptured type IV TAA. In 2000, she had undergone infrarenal aortic repair in a different hospital and subsequently, because of a prosthetic infection, graft removal and axillobifemoral bypass. The aorta was exposed with a thoracoretroperitoneal approach performing an incision through the 8th intercostal space, while the diaphragm was incised in a circumferential fashion. After systemic heparinization, the axillofemoral branch of the extra-anatomic bypass was clamped in the middle and opened transversally, and a shunt assembled as shown in Fig. 1 was inserted. The shunt was composed of a main segment in polyvinyl chloride (PVC) with inner diameter of 6.4 mm, provided with a luer-lock in the middle, and connected at the ends to a fitting with inner diameter from 6.4 to 4.8 mm (Fig. 2).

Finally, these fittings were connected through a luer-lock to an extension segment with a spout suitable for high pressure. The distal portion of descending

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thoracic aorta was prepared, clamped and cleared of surrounding haematoma. The proximal abdominal aorta presented a large laceration in its back and left-lateral aspect. Visceral and renal arteries were perfused using a 9 Fr Pruitt catheters connected to the luer-lock in the middle of the shunt (Fig. 1).

The aorta was opened longitudinally and a tube graft was attached proximally to the distal portion of descending aorta in an end-to-end fashion. After excision of a button of the prosthesis, a vessel patch, including celiac, superior mesenteric and right renal orifices, was anastomosed to the graft. The left renal artery was anastomosed to the graft in its inferolateral aspect. Finally, the distal portion of the tube graft was closed as a blind terminus. The shunt was removed from axillofemoral bypass and the conduit was anastomosed in an end-to-end fashion. First diaphragm and then thoracoabdominal incision were closed leaving chest and retroperitoneal tubes. The postoperative course was uneventful.

Discussion

Many different strategies have been developed for organ protection during the clamp-induced ischaemic period in TAA repair. It has been demonstrated that preliminary axillofemoral bypass reduces overall morbidity of TAA repair, particularly in difficult cases. This approach to TAA repair has been derived recently with the use of an aortoiliac side-arm conduit to maintain distal perfusion, mainly to the pelvis and legs. In fact, this tactic and other intraoperative techniques, i.e. left heart bypass or partial cardiopulmonary extracorporeal bypass, cannot guarantee an adequate visceral perfusion during the period of aortic clamping, also because retrograde bloodflow is associated with disposition of luminal debris into the renal and mesenteric vessels. With this report, we emphasize that during TAA repair it is possible to perfuse visceral arteries with an antegrade bloodflow with a simple shunt inserted easily in axillofemoral or internal bypass graft. This strategy offers a simple approach to the risk of end-organ ischaemic complications, especially in emergency cases.

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References


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