

Open Thoracic and Thoraco-abdominal Aortic Repair After Prior Endovascular Therapy

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WHAT THIS PAPER ADDS

This analysis confirms that open TAA(A) surgery as secondary procedure following endovascular aortic therapy is an important treatment option even in the endovascular era. Nevertheless, these complex procedures can entail significant risks and should therefore be reserved for specialised centres.

Objective: The aim was to present current results of open thoracic and thoraco-abdominal aortic repair as secondary procedure after prior endovascular therapy.

Methods: This was a retrospective cross border single centre study. From 2006 to July 2017 45 open thoracic aortic (TAA) or thoraco-abdominal aortic aneurysm (TAAA) operations were performed on 44 patients (median age 58 [15–80] years) as secondary surgery after previous endovascular therapy comprising TEVAR ($n = 38$; 86%), EVAR ($n = 3$; 7%), fenestrated EVAR ($n = 1$; 2%) and TEVAR plus EVAR ($n = 1$; 2%). Eleven patients (25%) had had previous open aortic surgery at the secondary surgery site. Indications for TAA(A) repair were Type I endoleak ($n = 10$; 23%), post-dissection aneurysm progression due to persisting false lumen perfusion ($n = 8$; 18%), proximal/distal disease progression ($n = 16$; 36%), device fracture/dislocation ($n = 4$; 9%), infection ($n = 5$; 11%), and initial endograft misplacement ($n = 1$; 2%). The operations included descending thoracic aortic repair ($n = 13$, 29%), TAAA Type I ($n = 4$; 9%), Type II ($n = 5$; 11%), Type III ($n = 13$; 29%), Type IV ($n = 7$; 16%), and Type V repair ($n = 3$; 7%) with simultaneous arch repair in 18% ($n = 8$). The median time to secondary surgery was 36 (2–168) months. The median follow up was 39 (3–118) months.

Results: In hospital mortality was 20% ($n = 9$) due to intra-operative aneurysm rupture, pneumonia induced sepsis, hemorrhagic cerebellar infarction, mesenteric ischaemia, broncho-esophageal fistula, and multiorgan failure (1/9) as well as haemorrhage (3/9). Estimated survival was 73% at 1 year and 71% overall. The most frequent complications were pneumonia ($n = 19$; 43%), bleeding requiring revision ($n = 11$; 25%) and sepsis ($n = 14$; 32%). Transient dialysis was required in 32% ($n = 14$), permanent dialysis in 6% ($n = 2$). Permanent spinal cord deficit (paraparesis) occurred in 6% ($n = 2$). Estimated freedom from aortic re-intervention was 86%.

Conclusion: Open TAA(A) repair as a secondary procedure after previous endovascular aortic therapy is an important treatment option even in the endovascular era. It represents a durable treatment that can produce respectable outcomes. Yet the peri-operative morbidity and mortality are relevant and a specialised team and infrastructure are mandatory for these complex procedures. Therefore, centralisation is required.

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INTRODUCTION

As endovascular techniques have evolved, the indications for endovascular therapy of aortic disease have expanded to more complex pathologies and to all aortic segments.¹ However, the rising number of endovascularly treated patients means an increase in the number of secondary re-interventions, especially in the mid- and long-term.^{2–4} Despite the ongoing improvement of endovascular modalities to treat different kinds of failures and complications following endovascular treatment,⁵ not all of them can be

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managed by endovascular means. There are still a relevant number of patients who require secondary open surgery or conversion. When the thoracic aorta is involved, this means thoracic aortic (TAA) or even extensive thoraco-abdominal aortic aneurysm (TAAA) surgery with or without simultaneous repair of the ascending aorta and aortic arch.^{6,7}

The aim of this study was to present current results of open TAA and TAAA repair as secondary procedure after previous endovascular aortic therapy.

MATERIALS AND METHODS

All 44 patients requiring open TAA(A) repair as secondary open surgery after previous endovascular therapy from January 2006 to July 2017 were included in this study. The distribution of the procedures over the study period is shown in Fig. 1. The operations were performed at two locations of one cross border aortic centre. In a retrospective data analysis the patient demographics, the procedural characteristics and the early and late post-operative course were evaluated. The study was approved by the local ethics committee.

Patient characteristics

The median age of the patients was 58 years (15–80 years). Thirty-six patients (82%) were male. Thirty-eight patients (86%) had been treated by thoracic endovascular aortic repair (TEVAR) in the past, three patients (7%) by endovascular aortic repair (EVAR), one patient (2%) by fenestrated EVAR (FEVAR), and one patient (2%) by both TEVAR and EVAR. Furthermore, one patient had been treated by implantation of a Sinus XL stent for acute type B aortic dissection (Fig. 2). The pre-existing endografts and stents were of different manufacturers as listed in Table 1. The median interval between the initial endovascular treatment and the open operation was 36 months (range 2–168 months). Eleven patients (25%) had had additional previous open surgery at the site of the reported secondary open



Figure 2. Pre-operative computed tomography scan of a patient treated previously by implantation of a Sinus XL stent for acute type B aortic dissection with true lumen collapse. The two slices of the distal descending thoracic aorta (axial views) show a post-dissection aneurysm with severe compression of the stent in the true aortic lumen.

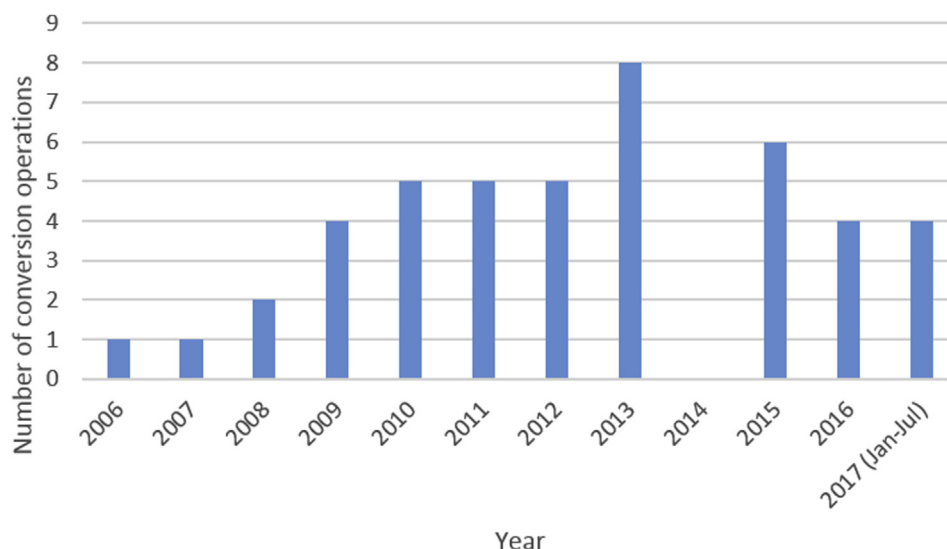


Figure 1. Distribution of the secondary open TAA(A) operations during the study period from 2006 to July 2017.

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