INVITED COMMENTARY

Aneurysm-related complications and life-long reinterventions after endovascular abdominal aortic aneurysm repair

Christos D. Karkos, FRCS

Vascular Unit, 5th Department of Surgery, Medical School, Hippokratio Hospital, Thessaloniki, Greece

Abdominal aortic aneurysm (AAA) patients treated by endovascular aneurysm repair (EVAR) are more likely to experience aortic complications and reinterventions than those operated on by open surgery. In this issue of the journal, Kakisis and colleagues[1] present a large modern experience of 628 EVAR patients that were treated in the vascular department of a large university hospital. The authors studied the reinterventions after EVAR.

EVAR revolutionized our practice and transformed our specialty over the last two decades. As our knowledge and experience increased and stent-graft technology evolved, EVAR became part of everyday aneurysm practice. Vascular surgeons had to master the procedure and refine the technique. However, unlike open repair patients, the EVAR patient will have to be followed carefully for life because the long-term results are not well known. During the follow-up, there will be stent-graft failures or aneurysm-related complications that may require re-interventions and vascular surgeons should familiarize themselves to deal with such problems in a variety of elective and emergency scenarios.

In the present series, 108 reinterventions were performed in 90 patients (14.3%). Type II endoleak was the most frequent cause of reintervention and resulted in 43 reoperations in 35 patients (5.6%). Of these reoperations, 21 were transarterial (9) or translumbar (12) embolizations, 20 were open surgical ligations and 2 were interventions for complications of embolization. Technical success of transarterial embolization was 78% and of translumbar 67%. Most type II endoleaks are considered as being benign. Nevertheless, aneurysm rupture has been described due to a type II endoleak. When to intervene is not entirely clear, but according to the 2019 ESVS guidelines on the AAA management, re-intervention for type II endoleak after EVAR (primarily by endovascular means) should be considered in the presence of significant aneurysm growth (class IIa, level B recommendation).[2] Significant growth is expansion of sac diameter 1 cm or more detected during follow-up using the same imaging modality and measurement method. Various treatment options exist. Endovascular treatment consists of transarterial, translumbar, transcaval, or transsealing (between iliac graft and iliac arterial wall) embolisation of the aneurysm sac and feeding vessels and is successful in 60-80% of cases. On the other hand, surgical options include laparoscopic or open ligation of side branches feeding the endoleak, suturing of the ostia of the leaking branch from the inside after opening the aneurysm sac or stent graft explantation with open conversion. The latter, being more invasive, is reserved for cases where endovascular intervention has failed.

The second most common reason for reintervention in the series was endograft limb occlusion. This required 32 reoperations in 23 patients (3.6%). Of these reinterventions, 13 required stent placement, 17 bypass and 2 thrombectomy combined with angioplasty. Post-EVAR reoperation for limb occlusion or kinking occurs in about 1.4-8% of patients in modern series. Reoperation will require a variety of open surgical or endovascular options. There is no evidence in the literature regarding superiority of one treatment option over the other, so the treatment strategy should be individualized depending on local preference and experience as well as patient factors.

The third cause of reintervention was type I endoleak (18 reinterventions in 17 patients, 2.7%). All Ib endoleaks (6 patients) were treated by extension of the endograft to the common or external iliac artery, while Ia (11 patients) endoleaks were treated by open conversion (5), proximal cuff (3), Palmaz stent (3) or embolization (1). Type 1 endoleak should be corrected promptly aiming to exclude the aneurysm sac for the systemic arterial pressure. Endovascular options include dilation with a molding balloon, placement of a balloon expandable stent (i.e. Palmaz type) or fixation with endovascular staples against the aortic wall if the graft is adequately sized, has not migrated, and there is an appropriate landing zone to achieve a seal.[2] If the latter is not the case, extension of the landing zone is required with proximal tubular or fenestrated cuff insertion, or distal iliac extension. If an endovascular option is not available and the patient is fit for open surgery, open conversion is an alternative.

Last but not least, less common causes of reintervention in the series included endograft infection (8 patients), type III endoleak (3), aneurysm rupture (1) and sigmoid (2) or buttock ischemia (1), all complex problems with significant risks for morbidity and mortality. Based on the recently published ESVS guidelines on the management of AAA patients, table 1 summarizes the literature data on the expected 5-year frequency of stent-graft complications post-EVAR.[2] This could help and guide practicing vascular surgeons through the patient informed consent process and related medicolegal issues.

Author for correspondence:

Christos D. Karkos

Vascular Unit, 5th Department of Surgery, Medical School, Hippokratio Hospital, Thessaloniki, Greece
E-mail: ckarkos@hotmail.com
ISSN 1106-7237/ 2019 Hellenic Society of Vascular and Endovascular Surgery Published by Rotonda Publications

Complications	% during 5-year follow up
Type I endoleak	5%
Type II endoleak	20-40%, 10% persistent at 2 years
Type III endoleak	1-3%
Type IV endoleak	1%
Endotension	<1%
Migration	1%
Limb kinking/occlusion	4-8%
Infection	0.5-1%
Rupture	1-5%

Table 1. Long-term stent-graft complications post-EVAR.

The authors are to be congratulated both for the skillful management of these complications in such a demanding group of patients and for documenting the frequency and results of their reinterventions. The take home message from this large experience is that we should follow our EVAR patients carefully for life, because problems may arise in a proportion of patients that will require additional procedures. Expertise with the management of such complications will grow with experience and appropriate training. Both open and endovascular techniques should be part of the armamentarium of the modern vascular surgeon.

REFERENCES

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