SHORT REPORT

Fatal Endovascular Device Failure in Ruptured Aneurysm

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We report a patient with a proximal endoleak, managed unsuccessfully as it was suspected to be a type 1a endoleak. The aneurysm ruptured. At open repair it proved to be a type 3b endoleak. An early type 3b endoleak has not been described before.

Keywords: Endovascular; Ruptured aneurysm; Complication; Adverse event; Endoleak; 3b; Device failure.

Introduction

The use of an aorto-uniiliac device for the emergency endovascular treatment of an abdominal aortic aneurysm (AAA) is well described.1,2 Type 1a endoleak is a major complication and can be treated with a top extension stent. A type 3b endoleak is caused by a fabric tear or sutureline breakage.3,4 Type 3b leaks have been described after a period of follow up and have been attributed to ‘wear and tear’ of fabric to metal.5 To our knowledge there have been no reports of ‘acute’ type 3b endoleaks in an aorto-uniiliac endograft occurring during or directly after graft placement. We present a case of an emergency placement of an aorto-uniiliac endograft in which a proximal endoleak persisted after treatment with Palmaz stents.

Report

A 83 year old man, presented with an asymptomatic AAA with a diameter of 7 cm. CT revealed an accessory right renal artery and a slightly conical neck, maximum diameter 21 mm, length 3 cm. An endovascular treatment was considered suboptimal. He was classified as ASA four with serious contraindications for surgery (including an untreated malignancy). A non-operative policy was chosen. Several months later, he presented with a symptomatic aneurysm. He was stable and wished to be treated. CT showed no signs of leakage. A zenith aorto-unilateral endoprosthesis (Cook®, Denmark; diameter proximal 24 mm, 3 mm oversized) was placed on the right side, combined with a passager stentprosthesis (Boston Scientific®) as distal extension graft. A contralateral occluder and a dacron crossover graft were placed. The endoprosthesis intentionally covered the accessory right renal artery. No stiff guidewires were inserted without protective catheters. At the end a significant type I endoleak was suspected. Angiograms in two projections were performed but the endoleak could not be located.

Two Palmaz stents (Cordis®, 25 mm, length 40 mm) were placed proximally with 25 mm PTA balloons. The endoleak still persisted (Fig. 1). An acute type 3b endoleak was not considered, because this has never been reported in the intra or direct postoperative phase. Because conversion was deemed impossible and the patient was stable, the operation was terminated.

The pain disappeared and the patient recovered rapidly. A spiral CT scan still showed the endoleak. A cause for the endoleak could not be identified and further analysis was planned. During observation the aneurysm ruptured. A tear of 12 mm at the 3rd stent at
the anterior side of the endoprosthesis was found during laparotomy. This tear was the result of a broken suture line, made to taper the graft (Fig. 2). There was no type 1, 2 or 3a endoleak.

The endoprosthesis was replaced by a standard dacron prosthesis. The patient subsequently developed multiple organ failure and died 2 days later.

**Discussion**

This case demonstrates a patient with a proximal endoleak, suspected to be a type 1a endoleak and managed accordingly, without success. At open repair it proved to be a type 3b endoleak, ultimately resulting in rupture of the aneurysm and patient death.

A manufacturing defect could be a possible cause for this complication, as the suture line made to taper the stentprosthesis was broken (Fig. 2). A proximal type 1a endoleak was first suspected and treated by the balloon expandable Palmaz stent. Dilatation of the stentgraft by the Palmaz stents could have contributed to the defect.

Retrospectively, the proximal endoleak could either have been a type 1a endoleak, sealed by the stents and followed by a type 3b endoleak, or it was a type 3b endoleak al along, being misinterpreted as a persisting type 1a endoleak. If the former is the case, it is possible that during ballooning and stenting for the suspected type 1a endoleak the tapered part of the stentgraft may have been damaged and the sutureline defect either caused or enlarged. The position of the most caudal Palmaz stent is located at the level of the endoleak.

Ballooning and stenting of an endoprosthesis proximally is done very often to improve or achieve proximal seal. To our knowledge, there have been no previous reports of an acute type 3b endoleak resulting from such manipulations.

If the index of suspicion for a type 3b leak would have been high enough, a covered stent or second aorto-uniliac endoprosthesis or even suturing of the defect may have been attempted and might have resulted in patient survival. A word of caution for the use of Palmaz stents in this type of graft is in place.

**References**


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