

Late Type 3b Endoleak: A rare cause of Endoleak following Endovascular Repair of Abdominal Aortic Aneurysm

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*Corresponding author

*F. M. Shaikh, Department of Vascular Surgery, North Wales Hospitals, Rhyl, United Kingdom.

F. M. Shaikh^{1*}, G. Eskandar¹, H. Jararah¹, A. Raudonaitis¹, O. Rees², L. Papp¹

¹Department of Vascular Surgery, North Wales Hospitals, Rhyl, United Kingdom.

²Interventional Radiology, North Wales Hospitals, Rhyl, United Kingdom.

Abstract

Introduction: Endoleaks remains most common complication following endovascular repair of aortic aneurysm. Endoleak is classified according to the source of persistent flow to the aneurysm sac. Type III b endoleak originates from a defect in the graft fabric. Here we report a case of late type III b endoleak from a tear in the main body of an Endurant (Medtronic) endograft, approximately 36 months, post endovascular repair of infra renal abdominal aortic aneurysm.

Methods: A 79 year old, male was referred to the vascular outpatient department (OPD), following a rapid enlargement of aortic abdominal aortic sac, noted on the annual ultrasound surveillance scan. He has underwent endovascular repair for a 5.6 cm, infra-renal abdominal aortic aneurysm with the deployment of Endurant (Medtronic) stent grafts, 36 months prior to the rapid increase of the aortic sac size. He had uneventful recovery from his EVAR. On follow up computed tomography aortic CTA scan at one and six months, a small type II endoleak was noticed. Patient was then placed on Ultrasound follow-up scans, annually following this surgical repair. However when patient presented on his annual ultrasound scan at 36 months follow up, an endoleak arising from left of the graft superiorly was noted with an increase in aneurysm sac size to 7.2 centimetres (cm). A CTA scan subsequently confirmed the increase in aneurysm size to 7.4 cm with suspicions of Type I or Type III Endoleak. Patient was then discussed at Vascular Multi-disciplinary meeting (MDT) and was planned for a diagnostic catheter aortogram to clarify the type of endoleak.

Result: Patient underwent a day case diagnostic catheter aortogram under local anaesthesia suggesting the diagnosis of endoleak as type I. Later he underwent fixation of stent graft to the neck with eight Hali FX endo anchors, however despite this fixation and ballooning the stent at the neck, there was no effect on the endleak, further oblique angiography demonstrated a defect in the proximal part of the graft in the main body, this was also confirmed by passing a catheter and a hydrophilic guide wire. It was then decided to repair the type 3b endoleak with re-stents and overlapping the previous stent grafts. Patient underwent successful aorto-uni iliac stent graft and a femoral to femoral synthetic bypass. A final catheter angiogram showed no sign of any Endoleak.

Conclusion: This case highlights the importance of continued surveillance of endovascular aortic grafts and the challenges to diagnose late type 3 111b Endoleak, a rare cause of sac expansion following successful Endovascular treatment of Abdominal Aortic Aneurysm Repair.

Introduction

It has been almost three decades since the introduction of endovascular prosthesis for aortic reconstruction of aortic aneurysm, however the technology is still evolving and search for the ideal device and optimal approach which is complication free and most durable continues (1). Endoleaks remains the most common complication following Endovascular Aneurysm Repair (EVAR) (1).

Endoleak is defined as persistence of blood flow, outside an endovascular graft but within the aneurysm sac in which the graft is placed (2). It is further classified into different types according to the source of aberrant blood flow. Type 3b endoleak originates from a defect in the graft fabric (2).

Here we report a case of late type 3b endoleak from a tear in the main body of an Endurant (Medtronic) endograft, approximately 36 months post endovascular repair of infra renal abdominal aortic aneurysm.

Case Report

A 79 year old male, with background history of hypertension and well controlled myasthenia gravis, was referred to the vascular outpatient department following a rapid enlargement of aortic abdominal aortic sac, noted on the annual ultrasound surveillance scan. He has undergone endovascular repair of his 5.6 cm, infra-renal abdominal aortic aneurysm with the deployment of Endurant (Medtronic) stent grafts, 36 months prior to rapid increase in the aortic sac size. He had an uneventful recovery from his EVAR.

On follow up computer tomography aortogram (CTA) scan at one and six months, a small type 11 endoleak was noticed. Patient was then placed on Ultrasound follow-up scans, annually following this surgical repair. However when the patient presented on his annual ultrasound scan at 36 months, an endoleak arising from left of the graft superiorly was noted with an increase in aneurysm sac size to 7.2

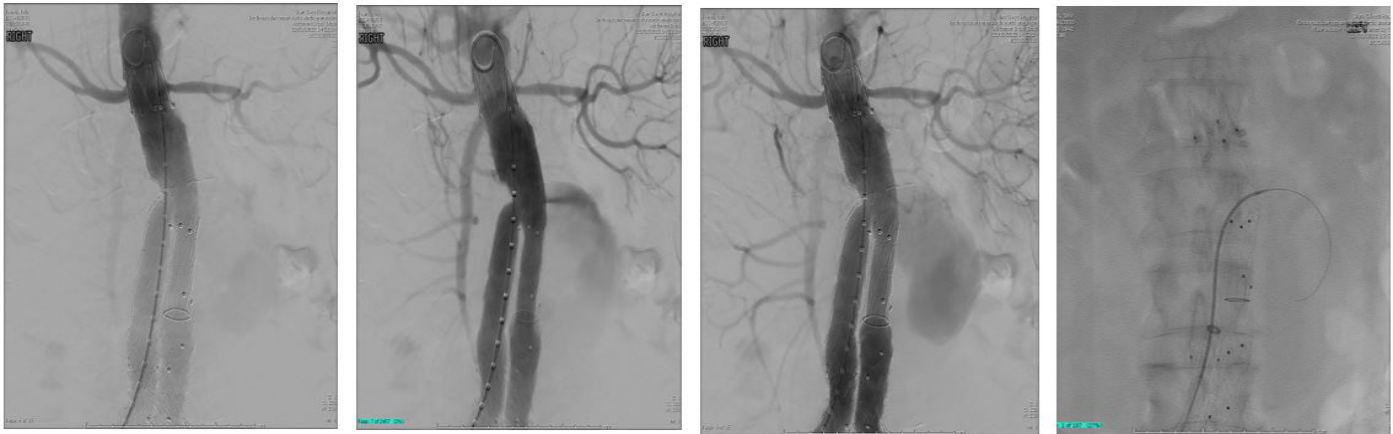


Figure 1a,1b,1c: Catheter aortography demonstrating early endoleak within the proximal aneurysm sac.

Figure 1d Showing the defect in the graft with a Cobra catheter and Terumo guide-wire feeding through the defect of the graft, into the endoleak cavity.

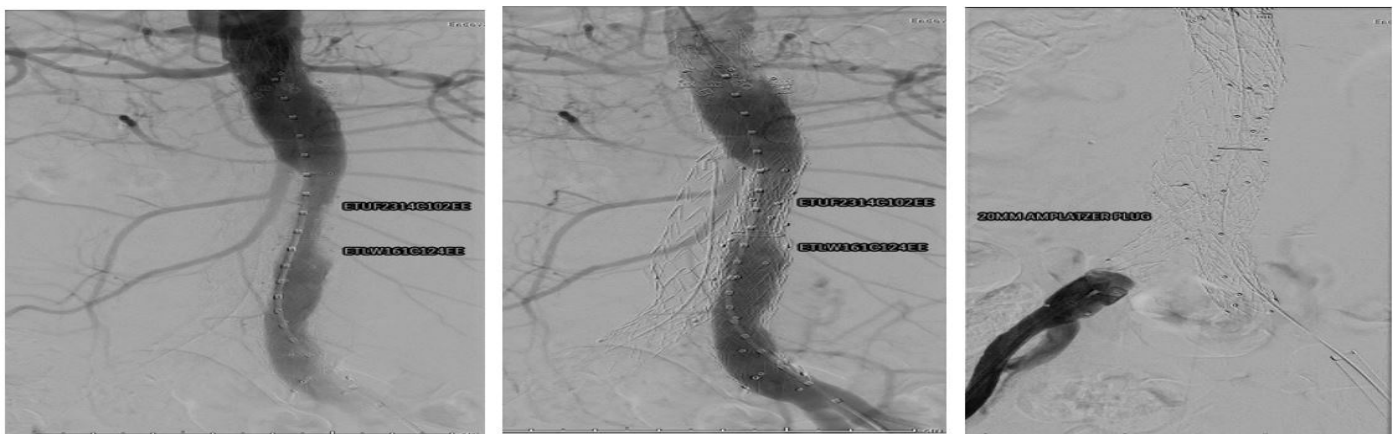


Figure 2a & 2b :Showing Left Aorto Uni. Iliac stent with complete resolution of type III endoleak & flow in left Iliac limb.

Figure 2c Showing AMPLATZER plug deployed in right iliac limb.

centimetres.

A CTA scan subsequently confirmed the increase in aneurysm size to 7.4 cm, with suspicions of Type 1 or Type 3 Endoleak. Patient was then discussed at Vascular Multi-disciplinary meeting (MDT) and was planned for a diagnostic catheter aortogram to clarify the type of endoleak. Patient underwent a day case diagnostic catheter aortogram under local anaesthesia raising the suspicion of type I endoleak. Following re-discussion at the MDT, patient was reviewed again in clinic and after informed consent, underwent fixation of stent graft to the neck with eight Hali FX endo anchors, however despite this fixation and ballooning the stent at the neck, there was no effect on the endoleak, further oblique angiography demonstrated a defect in the proximal part of the graft in the main body, this was also confirmed by passing a catheter and a hydrophilic guide wire (figure 1). It was then decided to repair the type 3b endoleak with re-stents and overlapping the previous stent grafts. Patient underwent a successful aorto-uni iliac stent graft and a femoral to femoral synthetic bypass. A final catheter angiogram showed no sign of any Endoleak (figure 2). At six months follow up, CT scan showed no sign of any Endoleak with patency of AUI and crossover femoral bypass graft.

Discussion

Type III endoleak remains a rare complication following EVAR. The overall incidence of type III endoleak in the earlier trials and registries ranges from 3% to 4.5% (3), however in recent studies the incidence is 2- 3 %– (3). Type III endoleak can be detected early or late and are further divided into two subtypes (2). Type IIIa endoleak originates from disconnection of the modular components while Type IIIb endoleak originates from a defect in the stent-graft fabric as seen in our case.

Although rare, type III endoleaks are considered potentially serious due to persistent blood flow into the aneurysm sac which can ultimately result in secondary aortic rupture. This risk of rupture is estimated to be nearly nine times and thus emphasizing the need for early repair after diagnosis (4). The diagnosis of type III endoleaks remains challenging (as seen in our case) as it is hard to detect this with CTA scan and even with catheter angiography it is extremely hard to detect the defect in the fabric.

The treatment of late type III endoleak often employs an endovascular approach as first-line. Options include re-aligning the existing graft with bifurcated stent grafts or extension grafts to overlap the area of defect (5). In our case the first diagnosis was type I endoleak and hence initial attempt was to treat it with the deployment of endoanchors and balloon the stents, however the endoleak persisted on

the completion angiogram, another cause of persistent endoleak was sought and found the defect in the fabric and the case was then successfully treated with realignment of the graft with another aortic unilateral iliac stent graft and doing a cross over femoral to femoral bypass. Failing endovascular treatment, open repair can be considered and this includes endograft preservation with in situ suturing, partial endograft explantation with re anastomosis or total explantation with replacement (1).

Conclusion

The case highlights the importance of continued surveillance of endovascular aortic grafts and the challenges to diagnose late type 3b Endoleak, a rare cause of sac expansion following successful Endovascular treatment of Abdominal Aortic Aneurysm. While advancements in technology and endovascular skills have reduced the rates of endoleaks the need for life-long aortic stent-graft surveillance continues.

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