



## Case Report

# Late Proximal Aortic Para-Anastomotic Aneurysm of an Aorto-Bifemoral Bypass Grafting Treated by Endovascular Devices

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**Citation:** Coppin T, Sow NF, Fortey H, Puschila A, Ghidoarca C (2023) Late Proximal Aortic Para-Anastomotic Aneurysm of an Aorto-Bifemoral Bypass Grafting Treated by Endovascular Devices. J Surg 8: 1874 DOI: 10.29011/2575-9760.001874

**Received Date:** 24 August, 2023; **Accepted Date:** 28 August, 2023; **Published Date:** 30 August, 2023

## Abstract

Nowadays Endovascular Aortic Repair (EVAR) is mostly reported to be the first choice for infrarenal abdominal aortic aneurysm treatment. Open Surgery Repair (OSR) remains widely performed as a safe and durable therapeutic option with good results. One of the major late complications of OSR is a para-anastomotic aneurysm. Traditionally treated by OSR, aortic para-anastomotic aneurysms (AoPAAs) were burdened by a high rate of postoperative morbidity and mortality. EVAR seems thus to be the first option for AoPAAs with good short and mid-term results. We reported a case of 80-year-old woman who presented a late proximal AoPAA diagnosed 16 years after an OSR of an infrarenal AAA. She was treated by standard EVAR with 2 straight endoprostheses deployed. Postoperative endpoints were good. The follow up is without adverse event reported after 6 months.

## Introduction

Nowadays Endovascular Aortic Repair (EVAR) seems to be the first choice for infrarenal Abdominal Aortic Aneurysm (AAA) cure. However Open Surgery Repair (OSR) remains an important, safe, and durable therapeutic option with good long-term results. Unfortunately, OSR has also its complications such as aortic para-anastomotic aneurysms (AoPAAs). This complication is described as a late complication with an incidence from 0.5 to 15% [1-3]. Aortic PAAs treatment traditionally consist of a conventional OSR. But reoperation is challenging and hazardous after primary aortic surgery with difficulties to find and clamp the aortic neck during the procedure. In such situation, EVAR is the first option for aortic PAAs with good overall results reported [4]. Several techniques are possible according to anatomical characteristics of PAAs such as standard EVAR, fenestrated EVAR (f-EVAR), branched EVAR (b-EVAR), and the chimney technique (ch-EVAR) [3,5]. We described an endovascular repair of a late proximal AoPAA

with intraoperative arteriographic images before and after aortic endograft deployment placement and postoperative follow up.

## Case Report

An 80-year-old woman was followed for poly-aneurysmal dysplasia including infrarenal abdominal aorta, right iliac, right internal carotid, and intracerebral arteries. She has a history of high blood pressure, dyslipidemia, asymptomatic lower extremity artery disease, permanent atrial fibrillation and hydronephrosis. She was operated of infrarenal AAA by an aorto-bifemoral bypass grafting in 2005. In 2007 she had a right temporal lobe hematoma. She had in 2012, a thrombosis of the right internal carotid artery with oculomotor paralysis and reduced visual acuity due to compression of the optical nerve. Until 2017, she was regularly followed with no further event and a still patent bypass grafting. She was then lost to follow-up until 2021. She came back with an ultrasound which showed a proximal anastomotic aortic abdominal aneurysm. A CT

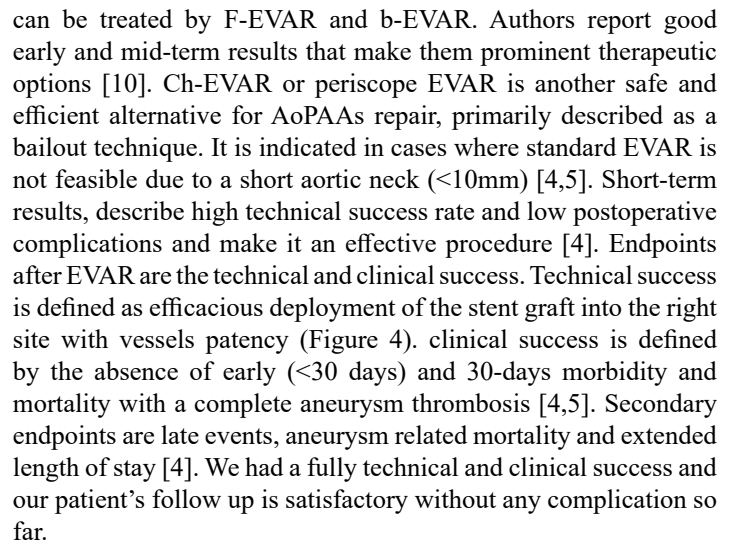
angiography was performed and confirmed a proximal anastomotic aortic abdominal para-aneurysm of 50mm in maximum diameter, partially thrombosed. The aorto-bifemoral bypass remained patent. The sizing of the AoPAA allowed to use endovascular material to exclude it. Open reintervention seemed to be challenging and hazardous. We proceeded to an open approach of the right branch of the prosthesis at the Scarpa. Two straight aortic endoprostheses were deployed. Control angiography was satisfactory, and the AoPAA was totally excluded. The patient spent 24h in intensive care unit and regained the standard hospitalization unit at day 1. Abdominal x-ray performed on day 2 and showed a good position of the grafts without any abnormality. The patient was discharged on day 4. On day 9 she presented with a hematoma of the operating site which was monitored on an outpatient basis and regressed spontaneously. At two months, she was reviewed with a normal ultrasound, showing a total exclusion of the anastomotic aneurysm, without any endoleak. At 6 months, the ultrasound still showed the good result of the endovascular procedure (Figure 1).



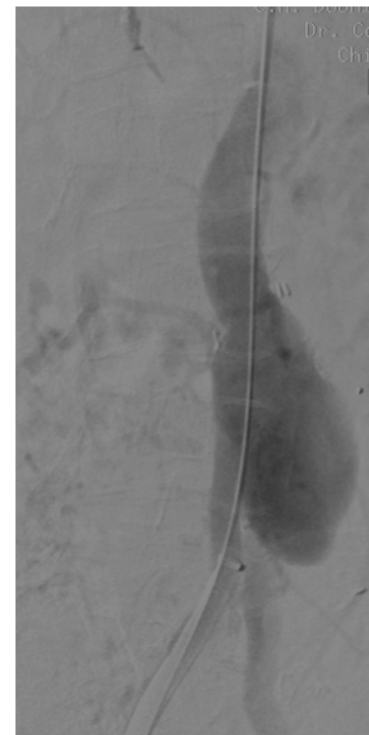
**Figure 1:** CT Scan showing false aneurysm with ruptured anastomosis.

## Discussion

Pseudo aneurysm of the aorta is the most frequent long-term complication after OSR for AAA [2,6]. Natural evolution of this complication is expansion with a high risk of rupture rate from 15 to 55%. For this reason, an effective radiological follow up and regular routine CTA after surgical reconstruction of an AAA [4,7] is essential (Figure 2). Multiple etiological factors can explain their occurrence. For late AoPAAs, several factors such as arterial degeneration from atherosclerosis, arteritis, medial fibrosis, but also prosthetic fatigue, suture breakdown and infection [8,9] are incriminated. So true AoPAAs are secondary to a dilatation of adjacent aortic wall near graft's anastomosis, and false AoPAAs due to a disruption of the graft's anastomosis [7]. AoPAAs are classified according to their type, size, and location. Some authors classified proximal AoPAAs in three types like the thoraco-abdominal aneurysms Crawford's classification<sup>5</sup>. For this reason, therapeutic strategies are based on this classification. Now, EVAR seems to be the first therapeutic option for the management of AoPAAs [3]. For various reason, open reintervention is quite hazardous and technically challenging [3,10]. Distortion of normal anatomic relationships and fibrosis through previously operated tissues are a source of complex and potentially hemorrhagic dissection. For infra-renal AoPAA, the shortness of the neck, re-clamping the same site, are major factors of complications [6]. Also, association of major patient's comorbidities explain the higher morbidity and mortality related to redo open repair for AoPAAs [10,11]. So, if there are no contraindications such as mycotic aneurysms, anatomical configuration, unavailability of the endovascular materials, EVAR seems to be the preferred therapeutic strategy.

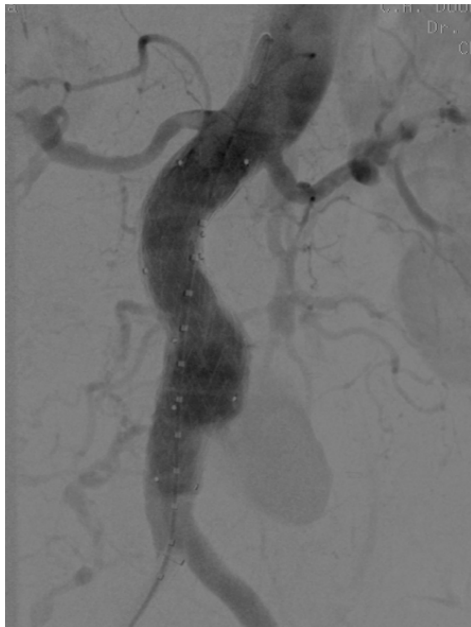


**Figure 3:** Before endovascular graft deployment.



**Figure 3:** Before endovascular graft deployment.

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**Figure 4:** Aneurysm exclusion after endovascular graft deployment.

## Conclusion

AoPAAs are described as the most common late complication after AAA OSR. Open re-intervention is a technically challenging surgery with high morbidity and mortality rate, EVAR (standard, fenestrated, branched and periscope techniques), when feasible, seems to be a prominent therapeutic option for numerous centers. Several studies show good early and mid-term results in term of technical success rate and low morbidity and mortality in high-risk patients. Longer follow up and multiplied series are necessary to confirm those data.

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