Case Report:

Treatment of Type 1C Endoleak after Endovascular Abdominal Aortic Aneurysm Repair Using Covered Stent from the between the External Iliac and the Internal Iliac Arteries

MUSAAD AL-GHAMDI, M.D.; MAT ROBESON, M.D.; SHUN MACDONALD, M.D. and JASON CLEMENT, M.D.

The Department of Vascular Surgery, St. Paul Hospital, Vancouver BC, Canada

Abstract

Purpose: To report a case with successful endovascular repairs of type 1c endoleak (EL) by excluding the source of the common iliac artery using endo-graft.

Method and Result: 84-year old male patient underwent an endovascular repair of 5.7cm abdominal aorta aneurysm (AAA) by endografting with aorto-uni endograft and femoral-femoral crossover and Amblatzer occlusion device was used in the right common iliac artery. The patient developed Type 1C EL around the amblatzer with sac expansion in the follow-up CT scan. After a failed trial of coil embolization, we were successfully able to exclude the source of EL by using endograft between the external and the ipsilateral internal iliac artery.

Conclusions: This case demonstrates the importance of follow-up and close monitoring of the type 1 EL and the successful management with endovascular approach avoiding major complications.

Key Words: Endoleak – Aortic aneurysm – Covered stent – Case report.

Introduction

ENDOLEAK (EL) is one of the most common complications after exclusion of an abdominal aorta aneurysm (AAA) by endografting. It has been defined as the persistence of blood flow around the endograft within the aneurysmal sac, which may lead to sac expansion and eventually rupture, especially with type 1 EL. The treatment of those EL is indicated with many options, endovascular option is the best of cures if it was successful [1-3].

We are reporting a case of successful endovascular repair of type 1 C EL using covered stent to exclude the leaking source after many failures using the conventional way (coil embolization) in the treatment at the same time preserving the flow to the internal iliac artery and preventing further complications.

Case Report

An 84 year old male, who was referred for his asymptomatic 5.7cm abdominal aortic aneurysm (AAA) to vascular surgery, St. Paul Hospital, Vancouver BC during 2009, Canada for further assessment and management, no abdominal symptoms, diabetes mellitus, hypertension or dyslipidemia. His past medical history was unremarkable; non-smoker and past surgical history included rotator cuff and hip replacement. On examination, there was a pulsatile upper abdominal mass, with no other significant findings.

CT scan of the abdomen showed 5.7cm AAA (Photo No. 1), bilateral mild iliac artery aneurysm 1.7cm, suitable proximal and distal landing zoon for endovascular aneurysm repair (EVAR), except the right iliac system was marked tortuosity (Photo No. 1).

The decision was made to go for EVAR aorto-uni system giving the finding on the CT scan after discussions all the options with the patient with risk and benefit.

The patient underwent an uneventful EVAR. Aorto-uni landed the left common iliac artery using Cook Zenith device, the right common iliac artery was occluded with amiplatzer device, fem-fem cross over was done using 8mm Dacron graft, completion angiogram shows some delay type 2
EL (Photos 2,3) we accepted the result at this time and both groins were closed.

Before discharge from the hospital the patient had a CT scan shows type 1c EL which we decided to follow up, giving time for the amplatzer to form a clot. On the 1st follow-up 1 month, CT scan 3rd month showed persistence of type 1C EL, with the fact that the sac size was decreasing by about 4 mm. At this time, the no intervention was done again. We decided to follow-up with CT in 6 months (Photo No. 4).

The 6th month follow-up showed the same finding with mild increase in the size of the AAA sac. The patient was brought to the angio-suite and coil embolization around the amplatzer was done and the completion angiogram was done with good looking sealing (Photos No. 5,6).

The 3-month follow-up CT scan showed the same type 1C EL with significant increase in the AAA sac size. The patient was booked for the 2nd interventional coil-embolization, which was not successful because of the proximity of the iliac bifurcations and inability to put more coils because of the risk of thromboses of the internal iliac artery (Photo No. 7).

In this stage, we brought an idea how we would treat this EL and preserve the internal iliac at the same time.

A V 12 Atrium stent graft size 8mm from the right external iliac to the right internal iliac with exclusion of the right common iliac artery. The final completion angiogram showed complete sealing of the stent with no EL (Photos No. 8,9).

Photo No. (1): 3-D reconstruction showing the right iliac vessel tortuosity.

Photo No. (2): Post-EVAR and amplatzer application with arteriogram showing no type 1C endoleak.

Photo No. (3): Completion angiogram showing delayed type 2 endoleak.
Photo No. (4): Cross-section CT scan showing type 1C endoleak, postoperatively.

Photo No. (5): Angiogram showing type 1C endoleak around the amplatzer.

Photo No. (6): Completion angiogram post-coil-embolization around the amplatzer with good sealing.

Photo No. (7): Post-second trial coil-embolization completion angiogram, showing persistent type 1C endoleak.

Photo No. (8): V 12 Atrium covered stent applied between the external and internal iliac arteries.

Photo No. (9): Completion angiogram showing patent internal iliac artery and complete isolation of the common iliac artery with no endoleak.
Discussion

It has been documented that one of the most common complications after EVAR is EL. It is one of the primary reasons to perform postoperative surveillance by regularly performed image studies, usually computed tomography (CT) scanning [1,2].

Primary type I EL occurred in 5.3%-7.5% of cases (7,8), most will resolve after endovascular interventions. Conversely, in some cases, the EL persisted after endovascular repair and some of them resulted in aneurysm enlargement and rupture [4-9].

According to the etiological classification of White et al. [10], type 1C EL is insufficient seal of an iliac occlusion device.

A variety of techniques have been used to treat EL. Early reports describe conversion from endovascular to conventional open aneurysm repair, conversion to conventional open repair is associated with significant complications [11,12]. Trans-catheter coil embolization was used preferentially to treat endoleaks originating from collateral branches of the aneurysm sac. Direct coil embolization of the aneurysm sac has been reported to be successful in treatment of type II EL [2].

One study suggested that coil embolization of type I EL does not effectively reduce intraneurysmal pressure, while Faries et al. [2] were able to treat 7/8 patients with 1-year follow-up with type 1 EL.

Localization of the source of the endoleak is essential for successful treatment and ongoing follow-up of these patients is important [4,13].

In our case, there were several options to treat the EL. We decided to give the chance of the amblatzer to thrombose and seal the EL. It was our first experience to have EL around the amblatzer. So, we decided to use coils around the amblatzer hoping for successful occlusion. Unfortunately, we could not succeed even after repeating the same procedure, we chose to preserve the internal iliac artery and at the same time excluded the common iliac artery. Since this type of leak is very rare not much in the literature regarding endovascular options.

Conclusions:

Type 1c EL is a risk of AAA sac expansion and the risk of rupture necessitates close mentoring and management. Endovascular stent graft repair for type 1c is an effective procedure to treat the EL and to preserve blood flow to the internal iliac artery.

References