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Case Report
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Massive Aortic Sac Aneurysm Following Open Surgery Treated With Percutaneous Drainage: A Case Report

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Abstract

A symptomatic 62 y-old male with shortness of breath and abdominal pain was found to have a rapidly enlarging aneurysm sac which has increased over 8 cm in three years on a contrast enhanced computed tomography (CT) scan without evidence of an endoleak or extravasation. The patient had an open surgical repair of a prior abdominal aortic aneurysm (AAA) 12 y ago. The native aorta has increased in size to 18 cm in diameter and shows several areas of small-contained ruptures. Following successful CT guided percutaneous drainage of the sac, which yielded sterile uninfected serous fluid, there was immediate symptomatic relief and the patient continues to do well.

Keywords: Aneurysm; AAA; Percutaneous drainage; Seroma; Aortic Sac

Introduction

Aortic perigraft seromas following open surgical repair are believed to be relatively rare complications; although, may occur more frequently than previously reported, as high as 18% [1]. They are usually found by imaging after the patient presents with symptoms of pain or discomfort after an average of 51 months [1]. Complications include rupture and compression of surrounding vessels and organs or the graft itself. Treatment is controversial and has included open surgical repair, endovascular treatment, and recurrent percutaneous drainage.

Case Presentation

The patient is a symptomatic 62 year-old male with shortness of breath and abdominal pain was found to have a rapidly enlarging aneurysm sac on a contrast enhanced computed tomography (CT) scan without evidence of an endoleak or contrast extravasation (Figure 1). The patient had an open surgical repair of a prior abdominal aortic aneurysm (AAA) 12 years ago. The native aorta has increased in size to 18 cm in diameter from 10 cm in just three years and shows several areas of small-contained rupture (Figure 2 and 3). Following discussions with the patient and vascular surgery, the decision was made to sample the fluid from a percutaneous approach and perform drainage of the sac to relieve his symptoms. The patient was placed supine on the CT table. Following the initial scout images, a safe anterior site on the abdomen was marked, prepped and draped in the usual sterile fashion. A 19-gauge Biopince needle (Angiotech Pharmaceuticals, Inc., Vancouver, BC, Canada) was used to puncture the native aortic sac under CT guidance (Figure 4). 30 ml of straw colored fluid was aspirated and sent to Pathology for gram stain evaluation (Figure

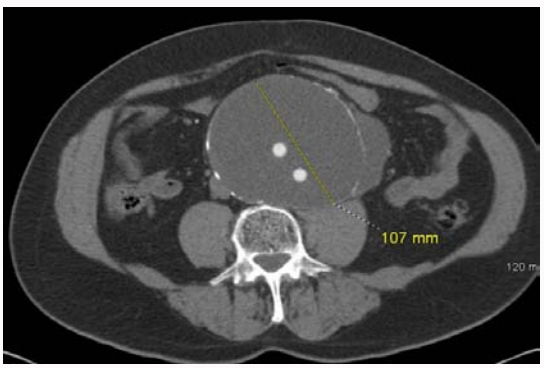

Figure 1: Computed tomography (CT) scan shows large aneurysm sac without evidence of an endoleak or contrast extravasation from 3 years prior.

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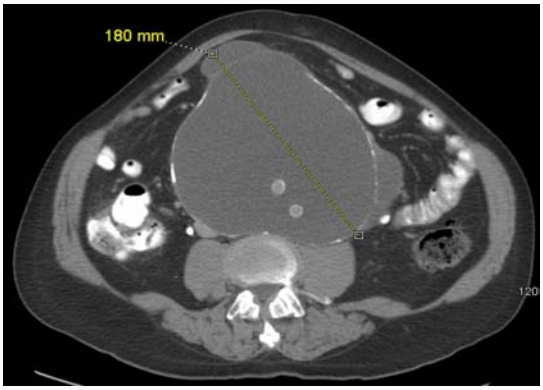

Figure 2: Shows recent axial CT demonstrating rapid increase in size of AAA.

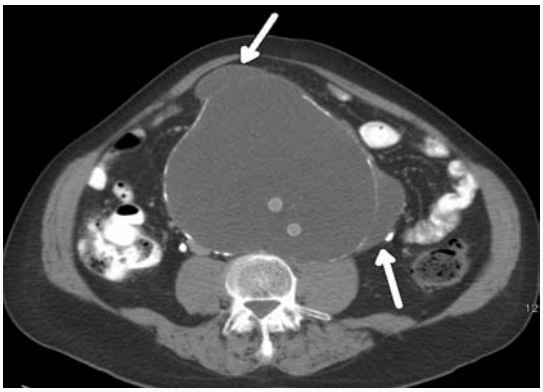

Figure 3: Shows two areas of contained ruptures anterior and lateral (arrows).

Figure 4: Show a 19-gauge percutaneously inserted to puncture the native aortic sac under CT guidance.

5). Following this, a Bentson guide wire (Boston Scientific, Natick, MA) was inserted through the needle and a 6 French Skater drainage catheter (Angiotech Pharmaceuticals, Inc., Vancouver, BC, Canada) was advanced over the wire into the posterior aspect of the aortic sac fluid collection (Figure 6). 1500 ml total fluid was removed with only minimum residual remaining (Figure 7 and 8). The catheter was then removed and a sterile bandage was placed. The patient tolerated the procedure without any immediate complications. Following successful CT guided percutaneous drainage of the sac, which yielded sterile uninfected serous fluid, there was immediate symptomatic relief and the patient continues to do well. The patient was seen in clinic one year later without imaging; however he continues to remain

Figure 5: Shows 30 ml of straw colored fluid aspirated from the AAA sac.

Figure 6: Shows a drainage catheter advanced over the wire into the posterior aspect of the aortic sac fluid collection.

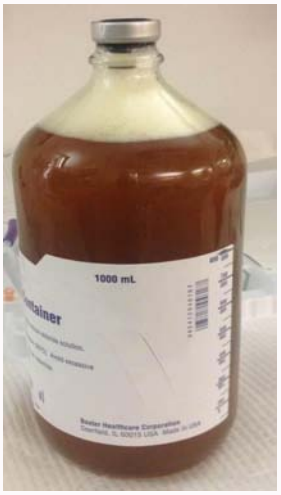

Figure 7: Shows container of the contents of the AAA sac after drainage.

asymptomatic.

Discussion

Aortic peri-graft seromas are relatively uncommon and the incidence is widely reported from 1.2-18% [1,2]. The variance in reported incidence is likely due to lack of patient symptoms. Symptoms can range from abdominal fullness, shortness of breath, compression of adjacent organs or surrounding vessels, or rupture. Follow up with serial CT scans is accepted with intervention only

Figure: 8: Shows an axial CT of the AAA sac following percutaneous drainage slightly superior to the limbs of the surgical aortic bi-femoral bypass. This demonstrates the only significant residual fluid remaining and also shows the redundancy of the aortic sac.

required for large seromas resulting in symptomatology. While it is unclear the exact cause of peri-graft seromas, many theories are proposed for the etiology of aortic peri-graft seromas. These include subclinical low-grade infection with reactive seroma, immunologic reaction to the graft, extravasation of a serous ultrafiltrate through the graft, and an osmotic phenomenon related to fibrinolytic cascade proteins within the peri-graft fluid collection [3]. Even a genetic phenomenon has been proposed as the cause of peri-graft seroma [4]. Su et al. describes a case of two brothers undergoing open AAA repair both of which developed peri-graft seromas after receiving polytetrafluoroethylene (PTFE) grafts.

Peri-graft seromas are a well-known complication of PTFE graft repair of arterial aneurysms, for AAA or otherwise. Borrero et al. [5] found that out of 1674 PTFE grafts placed over a period of two years, eight cases of chronic peri-graft seroma were documented. More recently, Kadakol et al. [1] found of the 111 study subjects they identified, 13 had aortic reconstruction with Dacron grafts and 98 with polytetrafluoroethylene (PTFE) grafts. Twenty patients (18%) had PGS, all of whom had PTFE grafts (20 of 98; 20.4%).

Typically, abdominal aortic peri-graft seromas are found on follow up CT scans with persistent slowly enlarging fluid collection with density approaching water measured by Hounsfield units (HU) of <25 involving the entire length of the graft. The average size and post-operative length of time until presentation are 6.0 cm (range 3.0-11.0 cm) and 51 months (range 4-156 months), respectively [6]. The current recommendations for open AAA repair are a follow up CT 60 months after surgery for evaluation of recurrent aneurysms. Karam and Shephard found that smoking, utilization of a left flank extra peritoneal approach, a bifurcated graft, and long-term anti-coagulation were four variables with significantly associated with peri-graft seroma formation with latter two having the strongest association.

Current management options include observation in those that are asymptomatic, open surgical treatment, endovascular treatment, or perhaps the least invasive, percutaneous drainage. With open surgical treatment, options include both drainage and marsupialization of the sac or in extreme cases, drainage of the seroma and surgical replacement of the graft. Endovascular treatment may consist of lining the graft with covered stents assuming the cause is due to porosity of the graft itself. Finally, percutaneous drainage as was done in this case is another option, arguably the safest. Possible complications include: infection, bowel perforation, graft perforation, and aortic sac rupture. Using CT guidance, these possible complications are minimized. Bowel or graft perforation is unlikely with direct visualization under CT guidance. Using proper sterile technique minimizes the possibility of graft infection. Using a small French catheter such as a 6 French which was used in this case minimizes an aortic sac rupture. A single direct aortic sac needle puncture when possible should lead to the lowest complication rate. The main two factors prohibiting successful percutaneous drainage include anatomical limitations and consistency of the sac contents.

Conclusion

Peri-graft aortic seromas are rare but perhaps more common than originally thought. Many theories have been proposed for the cause of these seromas but the exact etiology remains unclear. There are many treatment options and given the length of time for recurrence to become symptomatic, percutaneous drainage offers a safe alternative with decreased post-procedural complications given the less invasive nature.

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