

Dacron graft aneurysm with dissection

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Abstract

Dacron grafts have been used as a conduit for large caliber arteries for many years successfully. However, these grafts can undergo complications such as aneurysm formation, rupture, and failure. Evaluation of these complications are of paramount importance because of its tendency to rupture and cause death. Imaging plays an important role in identifying and monitoring of these complications, and also provides a road map to the vascular surgeons for early intervention and revascularization.

Key words: Aneurysm; aorta; dacron graft; dissection

Introduction

Dacron graft is a successful and commonly used vascular conduit for many arterial diseases. Despite its proven durability and long-term performance, structural abnormality secondary to mechanical defect or pressure dynamics of blood have been reported^[1-4] resulting in graft aneurysm and failure. However, a dacron graft aneurysm with dissection has not been reported. Therefore, we present an abdominal aortic bypass graft failure with unusual presentation of aneurysm with dissection.

Case Report

A 30-year-old female, with history of Takayasu arteritis underwent aortic bypass graft surgery. Two years later, she had a preterm baby died secondary to septic shock. She was anxious to conceive and a follow up imaging was recommended. Computed tomography (CT) abdominal aortic angiogram revealed the following findings: circumferential wall thickening and stenosis of suprarenal abdominal aorta with celiac trunk

occlusion [Figure 1]. Distal celiac artery was reformed by the arc of Buhler [Figure 2]. Similarly, stenosis of infrarenal abdominal aorta demonstrated with superior



Figure 1: Computed tomography angiogram showing circumferential wall thickening of abdominal aorta causing narrowing of the lumen with occlusion of the celiac trunk (arrow). Satisfactory opacification of aortic bypass graft seen (arrowhead)

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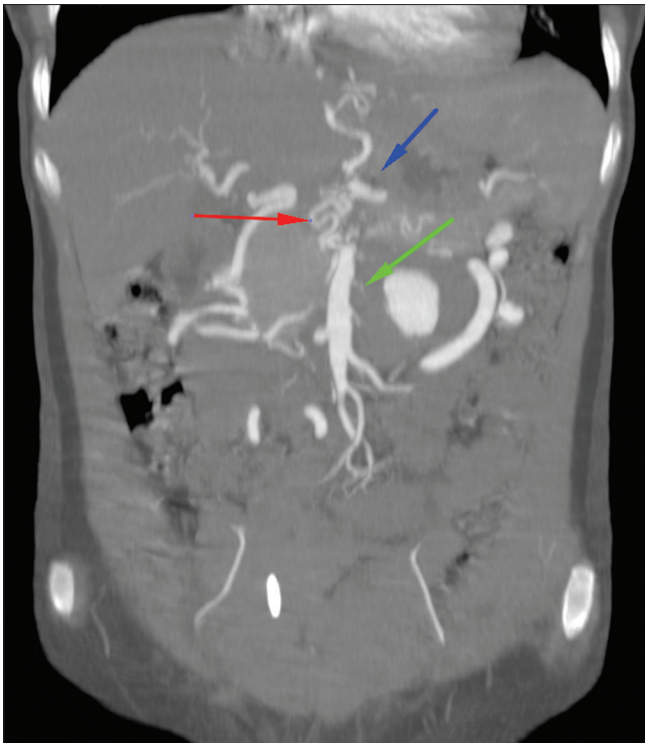


Figure 2: Coronal reformatted maximum intensity projection showing arc of Buhler collateral (red arrow) anastomosing superior mesenteric artery (green arrow) and celiac artery (blue arrow)

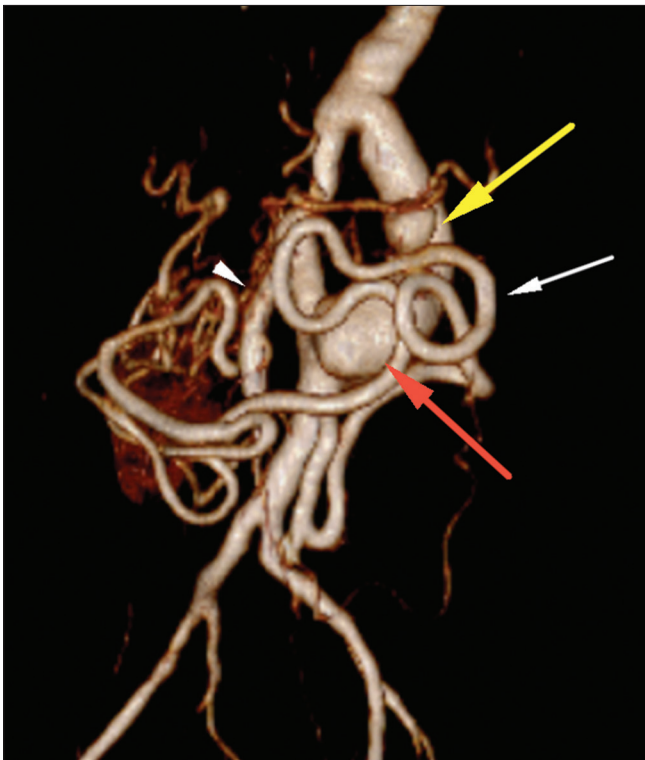


Figure 4: Three-dimensional volume rendered image showing dilated, tortuous arc of Riolan (white arrow) anastomosing superior (arrowhead) and inferior mesenteric artery. Aneurysmal Dacron graft (red arrow) with pedunculated aneurysm from the proximal Dacron graft (yellow arrow)

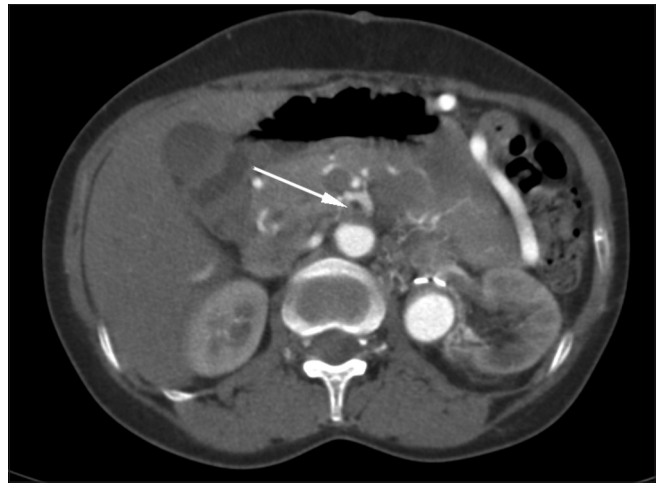


Figure 3: Computed tomography angiogram showing occlusion of superior mesenteric artery (arrow)

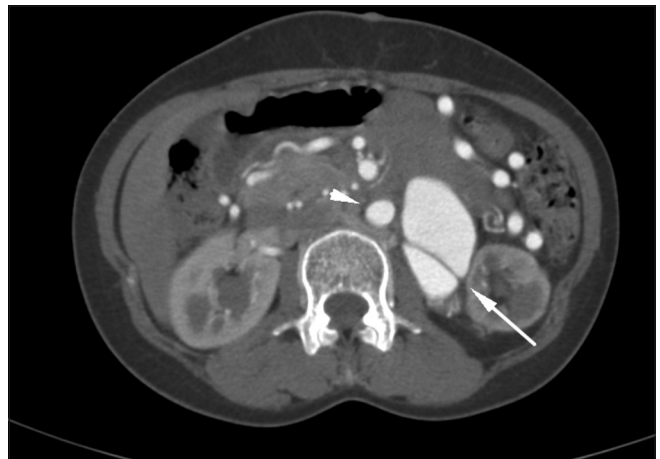


Figure 5: Computed tomography angiogram showing abdominal aorta (arrowhead) and aneurysmal Dacron graft with flap (arrow)

mesenteric artery occlusion [Figure 3]. Distal superior mesenteric artery was reformed by dilated, tortuous arc of Riolan [Figure 4]. Dacron bypass graft visualized anastomosing supraceliac and suprainferior mesenteric abdominal aorta [Figure 4]. 31 × 34 mm aneurysmal dilatation of distal aortic graft noted with incomplete flap, creating true and false lumen [Figure 5]. In addition, a pedunculated aneurysm measuring 17 × 14 mm from the proximal graft noted [Figure 4]. Left renal artery stenosis, revascularized by great saphenous vein from the Dacron graft. Distal abdominal aorta and iliac braches appear normal.

Discussion

Dacron aortic graft is the most widely used and reliable substitute for arterial replacement. Dacron graft (polyethylene terephthalate) is made from either knitted or woven type. Modern day Dacron grafts are of woven type, which has high tensile strength, resistance to stretching, and

degradation to abrasion and chemicals.^[1] However, there are few reports indicating dilatation and expansion of Dacron graft after implantation.^[2,3] In our patient, an incomplete flap demonstrated within the aneurysmal segment, consistent with dissection within the layers of wall of the graft. This could be attributed to mechanical property changes such as fiber stretching, structural damage to the integrity of the graft due to instrument handling, and distortion of graft from hydrostatic pressure.^[4] To the best of our knowledge after extensive literature search, none reported with this kind of presentation. Pedunculated aneurysm of the graft can be explained as a result of localized areas of microscopic structural damage due to manufacturing errors, inappropriate storage conditions, material fatigue, and biodegradation.^[2] Aneurysmal graft is prone to rupture and could prove to be lethal. Arc of Riolan, also known as meandering mesenteric artery, is a collateral channel between superior (SMA) and inferior mesenteric artery (IMA) in cases of stenosis or occlusion of either of the arteries. In our case, the occluded SMA is reformed by arc of Riolan from IMA, which is dilated presumably due to hyperdynamic flow.^[5,6] The celiac artery is reformed by the arc of Buhler, which is a collateral channel between the celiac artery and SMA.^[7] In conclusion, we recommend long-term cross-sectional imaging for the follow-up of Dacron graft recipients to monitor the integrity of the graft and guide vascular surgeons to intervene, if necessary to avoid lethal complications. CT angiography with multiplanar reconstruction, maximum intensity projections, and volume rendering aids in easy identification of aneurysm, vascular stenosis, and collateral channels.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards

of the institutional research committee. This article does not contain any studies with animals performed by any of the authors.

Informed consent

Informed consent was obtained from the individual participant included in the study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Noorani A, Ng C, Gopalan D, Dunning J. Haemoptysis from a Dacron graft aneurysm 21 years post repair of coarctation of the aorta. *Interact Cardiovasc Thorac Surg* 2011;13:91-3.
2. Nagano N, Cartier R, Zigras T, Mongrain R, Leask RL. Mechanical properties and microscopic findings of a Dacron graft explanted 27 years after coarctation repair. *J Thorac Cardiovasc Surg* 2007;134:1577-8.
3. Etz CD, Homann T, Silovitz D, Bodian CA, Luehr M, Di Luozzo G, *et al.* Vascular graft replacement of the ascending and descending aorta: Do Dacron grafts grow? *Ann Thorac Surg* 2007;84:1206-13.
4. Berger K, Sauvage LR. Late fiber deterioration in Dacron arterial grafts. *Ann Surg* 1981;193:477.
5. Kumaresh A, Rajoo R, Babu SR, Ilanchezhian S. A Rare Case of Aneurysm of Arc of Riolan Artery and Gastroduodenal Artery. *J Clin Imaging Sci* 2014;4:66.
6. Gourley EJ, Gering SA. The meandering mesenteric artery: A historic review and surgical implications. *Dis Colon Rectum* 2005;48:996-1000.
7. Saad WE, Davies MG, Sahler L, Lee D, Patel N, Kitanosono T, *et al.* Arc of Buhler: Incidence and diameter in asymptomatic individuals. *Vasc Endovascular Surg* 2005;39:347-9.