

Aortic pseudoaneurysm with fistulization to the right atrium: A case report



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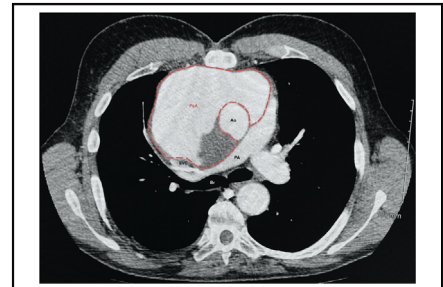
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The surgical technique to repair aortic root aneurysm has undergone significant advancement since the Bentall procedure was first performed in 1968.¹ The original Bentall used a composite aortic root graft with a mechanical aortic valve, wrapping native aortic tissue around the proximal graft. While the modified Bentall with coronary buttons has demonstrated fewer complications, the risk of pseudoaneurysm (PsA), although rarer, persists. PsA may complicate up to 6% to 10% of all aortic root repairs, at times several years following surgery.² We present the case of a patient who developed a large PsA with a cardiac fistulization 2 years after a modified bio-Bentall procedure.

CASE REPORT

A 67-year-old male patient with a history of coronary artery disease, hypertension, and type A aortic dissection repaired by ascending aortic grafting with concomitant mechanical aortic valve replacement initially presented to our academic medical center 2 years ago for an incidentally found 5.4-cm native aortic root aneurysm. We performed a modified (coronary button) bio-Bentall at that time with a 30-mm aortic graft and a 25-mm bovine pericardial valve.

Immediately after routine 2-year annual follow-up computed tomography (CT), he presented for urgent reoperation due to demonstration of an 8-cm ascending aortic PsA with impending rupture and compression of nearby structures (Figure 1). He reported chest pain, dyspnea on exertion, nonproductive cough, abdominal pain and distention, and a 5-lb weight gain—the latter symptoms concerning for right heart overload. Examination findings revealed a blood pressure of 112/59 mm Hg—inconsistent with his



Computed tomography angiography: pseudoaneurysm with clotted hematoma and active bleeding.

CENTRAL MESSAGE

Despite modified (coronary button) Bentall techniques, pseudoaneurysm remains a concern after aortic replacement operations, affirming the importance of annual follow-up imaging.

hypertensive history—as well as diminished bibasilar breath sounds and facial plethora.

Femoral–femoral cardiopulmonary bypass was used according to institutional preference. Deep hypothermic circulatory arrest was initiated before redo-sternotomy due



FIGURE 1. Computed tomography angiography demonstrating the pseudoaneurysm (PsA; outlined in orange), with clotted hematoma (no contrast) and active bleeding (contrast-enhanced) from the aorta (Ao), as well as the compression of nearby structures: the superior vena cava (SVC), right pulmonary artery (PA), and right main bronchus (Br).

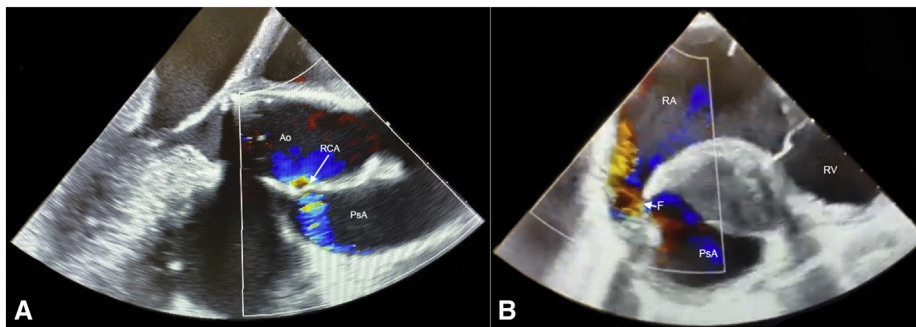


FIGURE 2. Transesophageal echocardiogram of (A) the aortic blood flow through a dehiscence at the site of right coronary artery (RCA) anastomosis to the aortic (Ao) graft, creating a pseudoaneurysm (PsA), and (B) the fistula (F) demonstrating blood flow from the PsA into the right atrium (RA). The right ventricle (RV) is labeled for orientation.

to risk of entering the PsA during sternal entry. Upon entry, the PsA was entered as predicted. The PsA bleed origin was identified at the anterior aspect of the aortic root/ascending aortic graft-to-graft anastomosis, confluent with a dehiscence right coronary button. PsA fistulization to the right atrium mediated decompression and perhaps preservation of biventricular function (Figure 2). The graft-to-graft anastomosis defect was repaired in confluence with the right coronary artery, mediastinal hematoma evacuated, and right atrial fistula ligated. The patient was extubated 2 hours postoperatively, downgraded from intensive care the following day, and discharged home postoperative day 4. He has recovered well to 2-month follow-up.

DISCUSSION

Infectious etiologies and predisposing connective tissue disorders may underlie aortic PsA; however, anastomotic dehiscence of previous aortic grafting may put any patient at sufficient risk for PsA.² The patient presented herein underwent urgent reoperation for a large PsA at 2 years following a modified bio-Bentall that was distally anastomosed to a previously placed ascending aortic graft. The original Bentall procedure of 1968—with native aortic tissue wrapping the aortic graft—was often complicated by PsA.¹ A variation by Cabrol mediated PsA decompression through the prophylactic creation of a peri-aortic/right atrial fistula during the primary operation.² Later, performance of a modified Bentall (the use of coronary buttons) dramatically decreased the risk of this potentially life-threatening complication.³

Our patient had a graft-to-graft anastomosis between the graft first interpositioned for his aortic dissection and the graft of his bio-Bentall subsequently placed to address his root aneurysm. The PsA bleed originated at the distal anastomosis of the aortic root graft involving the right coronary button, 2 of the 3 characteristic locations for dehiscence causing aortic PsA.⁴

Early identification is key in this patient population: it can circumvent free rupture or fistulization of the PsA. Routine follow-up CT angiography imaging is likely sufficient to identify PsA but not the site of dehiscence or associated fistulization, the latter of which is best discerned on transesophageal (TEE) versus transthoracic echocardiogram.⁵ TEE should thus be considered as a component of routine follow-up of patients who have undergone aortic root replacements, as it could detect PsA, graft dehiscence, and complications such as fistulization.^{4,5}

Our patient's condition may have been diagnosed by his compressive symptoms even without routine imaging. His symptoms were intriguing in their mimicry of superior vena cava syndrome, with facial plethora, and congestive heart failure, with weight gain, dry cough, and dyspnea. However, a later presentation may have further complicated the PsA repair and worsened his prognosis.

CONCLUSIONS

Two years after undergoing a modified bio-Bentall procedure, this patient experienced signs and symptoms of PsA with compressive features and fistulization, identified by CT and TEE, with a good outcome after urgent operative intervention.

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