SHORT REPORT

Infrarenal Aortic Infection and Rupture of a Pseudoaneurysm Secondary to Migration of Proximal Aortic Patch: Case Report and Literature Review

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Aneurysm formation at the site of prior aortic coarctation patch repair is well documented. Migration of the patch though to the infrarenal aorta, as in this case, with subsequent aortitis and pseudoaneurysm formation has not been described. A 16 y old boy who was operated at the age of 10 for his aortic coarctation, presented with sepsis and abdominal pain. CT scan confirmed the presence of aortitis and an aortic pseudoaneurysm. This was treated with resection of the infrarenal aorta and replacement with superficial femoral vein. The PTFE patch from the previous coarctation repair was found and extracted from the infrarenal aorta.

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Introduction

Repair of aortic coarctation has a well documented outcome and complications. Aneurysm formation at the repair site has been reported between 4 and 46% after patch repair of the coarctation. However, migration of the patch, with subsequent aortitis and rupture of the infrarenal aorta has not been described to our knowledge. We hereby would like to share our experience with this situation, along with the challenging management and options in this young patient.

Case Report

This is a 16 year old boy, presented with fever, severe abdominal and left hip pain. Past history: at the age of 10 years, patient was operated urgently for a spontaneous ascending aortic aneurysm rupture replaced with polyester graft. Postoperative evaluation demonstrated a tight aortic coarctation, which was then repaired via left thoracotomy with an e-PTFE patch repair. The patient did well and remained asymptomatic until 3 years later, when he presented with fever and abdominal pain; the latter symptoms were attributed to splenic abscess as confirmed by CT scan. Laparotomy, splenectomy and distal pancreatectomy were done at that point. Patient was discharged on oral penicillin and remained well until the current admission. He then represented 3 years later, at the age of 16, with abdominal pain and leukocytosis (white blood cell count of 28,700). CT scan of the abdomen and transthoracic echocardiography were done. There was a bicuspid aortic valve with moderate regurgitation, normal ascending aortic graft, descending thoracic aorta 2.2 cm in diameter, except at the isthmus area where it was 3.3 cm. Fig. 1.

Computed tomography scan of the abdomen and pelvis showed a hypodense lesion of the infrarenal aorta and an aortic mycotic aneurysm. Fig. 2; Fig. 3.

Patient underwent exploratory laparotomy. After excision of the aortic pseudoaneurysm and debridement of the infrarenal aorta, patch material that had migrated from the prior descending thoracic aortic site repair was extracted from inside the infrarenal aorta.
aorta. Fig. 4 and Fig. 6. The aorta was repaired with reversed left superficial femoral vein conduit, and covered with a flap of omentum. Fig. 5. Intraoperative cultures grew Enterobacter agglomerans. Patient had an uneventful postoperative course, and was discharged home after receiving one month of IV Imipenem. Follow up CT scan was planned to check on his proximal descending thoracic aorta. However, patient was lost to follow-up and left the country. Many attempts to contact him or his family failed.

Discussion

Repair of aortic coarctation can be performed in several ways depending on the age and anatomy. The preferred technique in infants and neonates, when feasible, is resection and extended end-to-end anastomosis1,2,3 or subclavian artery patch aortoplasty.4 For older children, prosthetic patch repair remains the most commonly used approach.5 More recently in older children and adolescent, endovascular option using balloon angioplasty with or without stenting, is gaining popularity. Long term complications include aneurysm formation at the repair site occurring in 4 to 46% of operated cases,5,6,1,7 commonly after patch aortoplasty, residual or recurrent stenosis,2 more rare events include aorto-tracheobronchial or aorto-pulmonary fistulas.8

The patient presented here had PTFE patch that migrated from the original coarctation repair site,
and caused an infected infrarenal aortic pseudoaneurysm. This complication to our knowledge has not been reported.

Aortic pseudoaneurysm secondary to foreign bodies has been documented. The offending element can be ingested, (like in dentures or safety pins) aspirated in the tracheobronchial tree, or less commonly, foreign body embolization in the circulation. Most of the cases we could trace involve the descending thoracic aorta.

Aortic injury and bullet embolization was described as in the case reported by Abad. J et al., where a bullet migrated from the aorta to the left iliac artery. Bullet embolization from the arch to the popliteal artery has been mentioned. Furthermore a collective review of 21 cases of intravascular missile embolization in children was reported by Massad et al with bullets being the most common material and arterioarterial the most widespread route.

Intravascular embolization of catheters or other interventional or monitoring devices has also been described and is also rather infrequent occurrences.

The aortic patch migrated in this case and lodged within the infrarenal aorta, causing aortitis, rupture and pseudoaneurysm formation at this level. The aortic patch in our case could have been infected since the perioperative period, progressively causing detachment from the repair site and subsequently infecting the infrarenal aorta where it lodged. The culture recovered (Enterobacter agglomerans) would favor this possibility, being usually a hospital acquired infection. Alternatively, later infection may have resulted from hematogenous spread.

Treatment in this setup of infected infrarenal aorta and pseudoaneurysm represents a challenge. Without intervention, this will lead to the demise of the patient. Operative options include aortic debridement followed by extra anatomic bypass (e.g. Axillofemoral- femoral bypass), or debridement with in-situ prosthetic grafting. Insitu bypass was chosen in this case because of the perceived, durability of the anatomic reconstruction in this location.

Aortic replacement using deep lower extremity veins (namely Superficial Femoral Vein), a procedure championed by Dr. Clagett and his group, has shown very rewarding results, with originally no or minimal clinically significant venous hypertension in the ipsilateral extremity following vein harvest. Lately however caution was advised for the need of facsiotomies, especially following aortic replacement or when the greater saphenous vein is concomitantly harvested and when the vein resection extends beyond the adductor hiatus.

In our patient, young age was a strong consideration and therefore, a durable repair that answers also the infectious problem was needed. Aortic debridement with anatomic replacement using the superficial femoral vein was done. The size match between the aorta and the vein was excellent and Omental flap was used to cover the repair.

Patient had a very smooth postoperative course, and after completing a full course of intravenous antibiotics he was discharged with no evidence of ongoing infections, and no clinical signs of lower extremity venous hypertension.

Concerns remain regarding the future progression of the thoracic aortic original patch site to aneurysm/ pseudoaneuerysm formation and rupture, especially because it is a well-documented complication of the patch repair for coarctation of the aorta, even without patch migration.

Fig. 5. Superficial femoral vein conduit repair of the infrarenal aorta (black arrow).

Fig. 6. Prosthetic patch extracted from the infrarenal aorta.
Conclusion

Infrarenal aortic infection and pseudoaneurysm are rare and even more so are patch migration from a more proximal aortic repair as an etiologic factor. The above anecdotic situation has not been previously described, to our knowledge. Therefore the management of this potentially morbid presentation remains most challenging, especially when it occurs in a younger age group. By sharing our experience with this unusual case, we hope to emphasize the efficacy of the deep lower extremity vein for aortic repair in this specific, potentially disastrous situation.

References


