

An aortic conundrum – Delayed ATAAD repair in the setting of devastating stroke followed by pseudoaneurysm of the proximal descending aorta

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BACKGROUND

- Neurologic injury is a feared complication of acute type A aortic dissection (ATAAD). In this setting, the urgency of repair is weighed with the risk of cerebral reperfusion and hemorrhagic conversion of ischemic infarction.
- We report a case of delayed repair after a devastating stroke, followed by pseudoaneurysm of the proximal descending aorta that was successfully managed.

CASE DESCRIPTION

- A 59-year-old female with history of breast cancer, sarcoidosis, and known chronic Type B_{4,10} dissection diagnosed in 2013. She became symptomatic with evidence of aneurysmal degeneration in 2021 and underwent an uncomplicated extent-III open thoracoabdominal aneurysm repair.
- She re-presented in 2023 with acute onset chest pain and unresponsiveness and was found to have an ATAAD_{0,3} with dissection of the innominate and left subclavian arteries, and occlusion of the right subclavian and common carotid arteries (Figure 1A). On exam, she was intubated, unresponsive, and with extensor posturing of all extremities. Imaging was consistent with large right hemispheric infarct (Figure 2). Surgical intervention was deferred given her extremely poor prognosis.
- Over the next three months she made a remarkable recovery with only residual left hemiparesis and emotional lability. In this time, she also developed symptomatic severe aortic insufficiency requiring multiple hospitalizations for congestive heart failure and had dilation of the ascending aorta to 5.5 cm.
- At this time, she underwent elective intervention. She had a large entry point at the STJ with dissection extending to the non-coronary and right coronary cusps. No tear was identified in the arch. We performed an ascending aorta and hemiarch replacement (30mm Gelweave), aortic root repair, and aortic valve replacement (#23 biological). Her post-operative course was uncomplicated, and she was discharged on post-operative day seven. Post-operative CTA showed no residual false lumen and a well seated graft.
- Three weeks later the patient presented to the emergency department with chest pain and found to have a large 2.7 cm x 2.8 cm pseudoaneurysm distal to the left subclavian and superior to the prior thoracoabdominal graft (Figure 1B-C, Figure 3). The patient subsequently underwent emergent thoracic endovascular aortic repair with a Gore cTAG 34mm X 34mm X 200mm graft (Figure 1D). Her post-operative course was uncomplicated and was subsequently discharged to continue her rehabilitation at an outside facility.

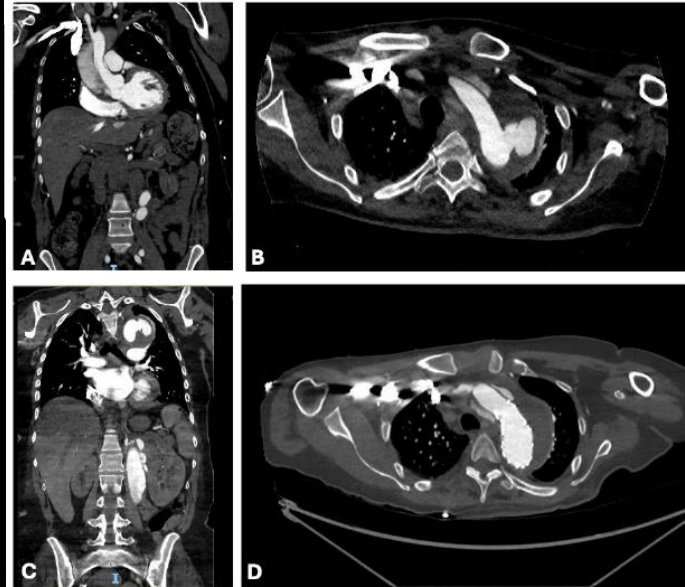


Figure 1. Computed Tomography Angiography (CTA) of (A) Acute type A aortic dissection (ATAAD) on initial presentation with right common carotid artery occlusion. (B & C) Pseudoaneurysm of the descending thoracic aorta distal to the ATAAD repair and proximal to the previous thoracoabdominal repair. (D) Exclusion of the pseudoaneurysm after successful thoracic endovascular aortic repair (Gore cTAG 34 mm X 34 mm X 200 mm graft)

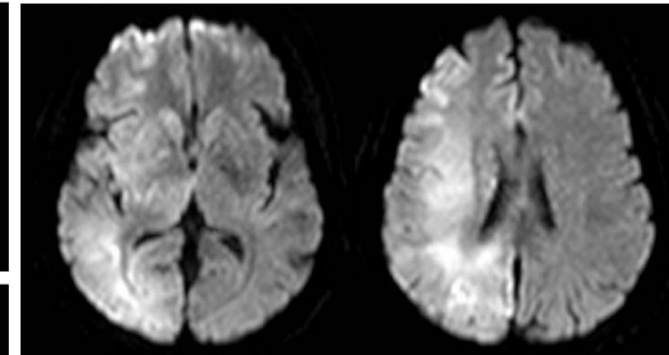


Figure 2. Magnetic resonance imaging (MRI) brain diffusion weighted imaging (DWI) sequence showing extensive restricted diffusion along the right cerebral hemisphere suggestive of acute infarction.



Figure 3. 3D Reconstruction of Computed Tomography Angiography (CTA), showing pseudoaneurysm of the descending thoracic aorta.

CONCLUSION

- There is currently no consensus on the initial management of ATAAD in comatose patients. Here, we present a successful case in the delayed management of ATAAD after remarkable recovery from a devastating stroke.
- This case also highlights the management of the short segment of native, proximal descending aorta that remained after her initial interventions. Performing a frozen elephant trunk at the time of proximal repair would have likely prevented the pseudoaneurysm from developing; however, we elected to perform only a hemiarch to minimize the complexity of the operation given the patient's increased morbidity.
- Nevertheless, this case showcases the combination of open and endovascular approaches to manage a high-risk patient.