

IMAGES IN INTERVENTION

Aberrant Vertebral Artery

An Intruder into the Aortic Arch (Atypical Bow Hunter's Syndrome)



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A 24-year-old female patient, who had undergone stenting for aortic coarctation 4 years previously, referred to our clinic. She described some episodes of syncope and dizziness in the preceding 6 months, for which her treating neurologist had prescribed antiepileptic agents for a diagnosis of seizure.

Follow-up aortic computed tomography (CT) angiography demonstrated a juxta-stent pseudoaneurysm at the coarctation site (Figure 1).

The first challenge was whether to choose the surgical or the endovascular approach for the exclusion of the pseudoaneurysm. The patient refused the choice of the surgical approach, which would entail a subcostal incision or probably a median sternotomy to access the complex anatomy of this region. The second challenge was the aberrant location of her large left vertebral artery, between the left carotid and subclavian arteries.

The day before the main procedure, we created a carotid-subclavian graft and clamped the subclavian artery proximally, thus averting the predictable hand ischemia in the absence of a retrograde flow from the vertebral artery (Figure 2).

The following day, we resolved the proximal-distal aortic diameter mismatch by using a custom-made device (26 to 22 × 110 mm). Our major concern vis-à-vis the endovascular approach was the possible consequences of covering such a large vertebral artery by the graft. Our fears were allayed after 4-vessel CT angiography illustrated a complete posterior cerebral artery supply and an acceptable size of the

right vertebral artery. After the deployment of the custom-made graft device, we coiled the aberrant vertebral artery close to the pseudoaneurysm cavity using a jailed catheter to preclude the risk of coil migration (Figure 3).

The final angiography (Figure 4) and follow-up CT angiography (Figure 5) did not show any endoleak, especially from the vertebral or subclavian arteries. The striking clinical consequence of the procedure was the nonrecurrence of the patient's syncopal attacks despite the discontinuation of the antiepileptic agents after about 9 months.

Following coarctation repair, whether endovascularly or surgically, patients should be kept under regular surveillance to prevent untoward situations and even emergent bleedings (1) in the wake of pseudoaneurysm formation in the pathologically affected portion of the aorta. It is not an out-of-the-ordinary event to encounter variations in the aortic arch requiring intervention (2). The good news is, however, that we now live in the era of endovascular solutions to aorta pathologies.

Bow hunter's syndrome, also known as rotational vertebral artery occlusion syndrome, is a rare form of vertebrobasilar insufficiency resulting from dynamic mechanical occlusion or stenosis of the vertebral artery during head and neck rotation or extension. Abnormal bony structures such as osteophyte, lateral disc herniation, or rarely, tumor compression are some of underlying pathologies, and the condition is manifested by symptoms including vertigo, nausea, syncope, or drop attacks

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FIGURE 1 Pseudoaneurysm Formation at the Edge of the Stent at the Coarctation Site

Follow-up computed tomography angiography of the aorta showed an outpouching (2×1.5 cm) next to the proximal edge of the stent at the coarctation site. A large aberrant vertebral artery originated from the proximal landing zone of the aortic arch. The **red arrow** shows a subclavian artery.

FIGURE 2 Digital Subtraction Angiography of the Aortic Arch

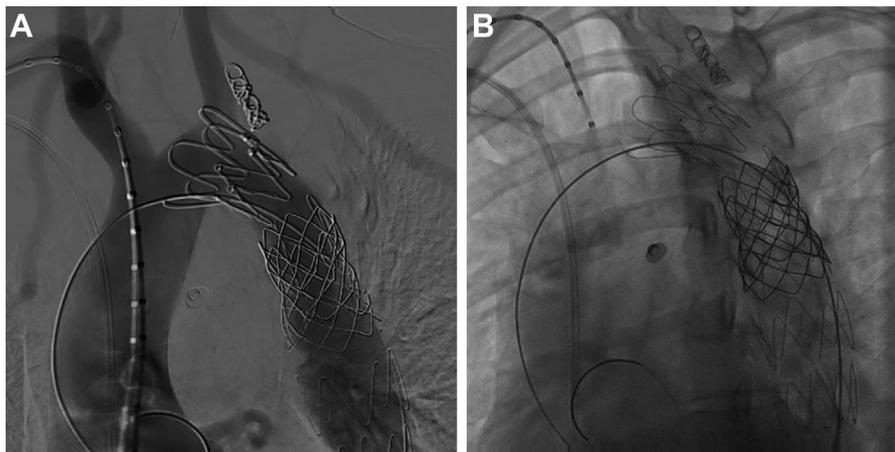
After the creation of a left carotid-left subclavian graft to restore the patient's arm perfusion following subclavian coverage, an endovascular procedure was planned to exclude the pseudoaneurysm. A patent ductus arteriosus was also depicted in this view.

FIGURE 3 Full Coverage of the Aberrant Vertebral Artery, the Pseudoaneurysm, and the Left Subclavian Artery



Before the deployment of the custom-made graft device, a jailed catheter was inserted into the vertebral artery for coil embolization.

FIGURE 4 Exclusion of the Pseudoaneurysm, the Aberrant Vertebral Artery, the Left Subclavian Artery, and the Patent Ductus Arteriosus



The proximal landing zone for the custom-made device started immediately after the left carotid artery. After the deployment of the graft, the VA was coiled via the jailed catheter. The final angiography showed the full disappearance of the pseudoaneurysm and the adjacent structures (A and B).

FIGURE 5 Follow-Up CTA After 9 Months

Patent carotid-subclavian graft, occluded vertebral artery by coils, disappeared aortic pseudoaneurysm are noticed in the image. CTA = computed tomography angiogram.

(3). It appears that our patient's case was a rare presentation of vertebrobasilar insufficiency due to vertebral artery compression syndrome, which we wish to term the "atypical bow hunter's syndrome."

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