

Left Subclavian Artery Stenting with Embolic Protection of Vertebral Artery



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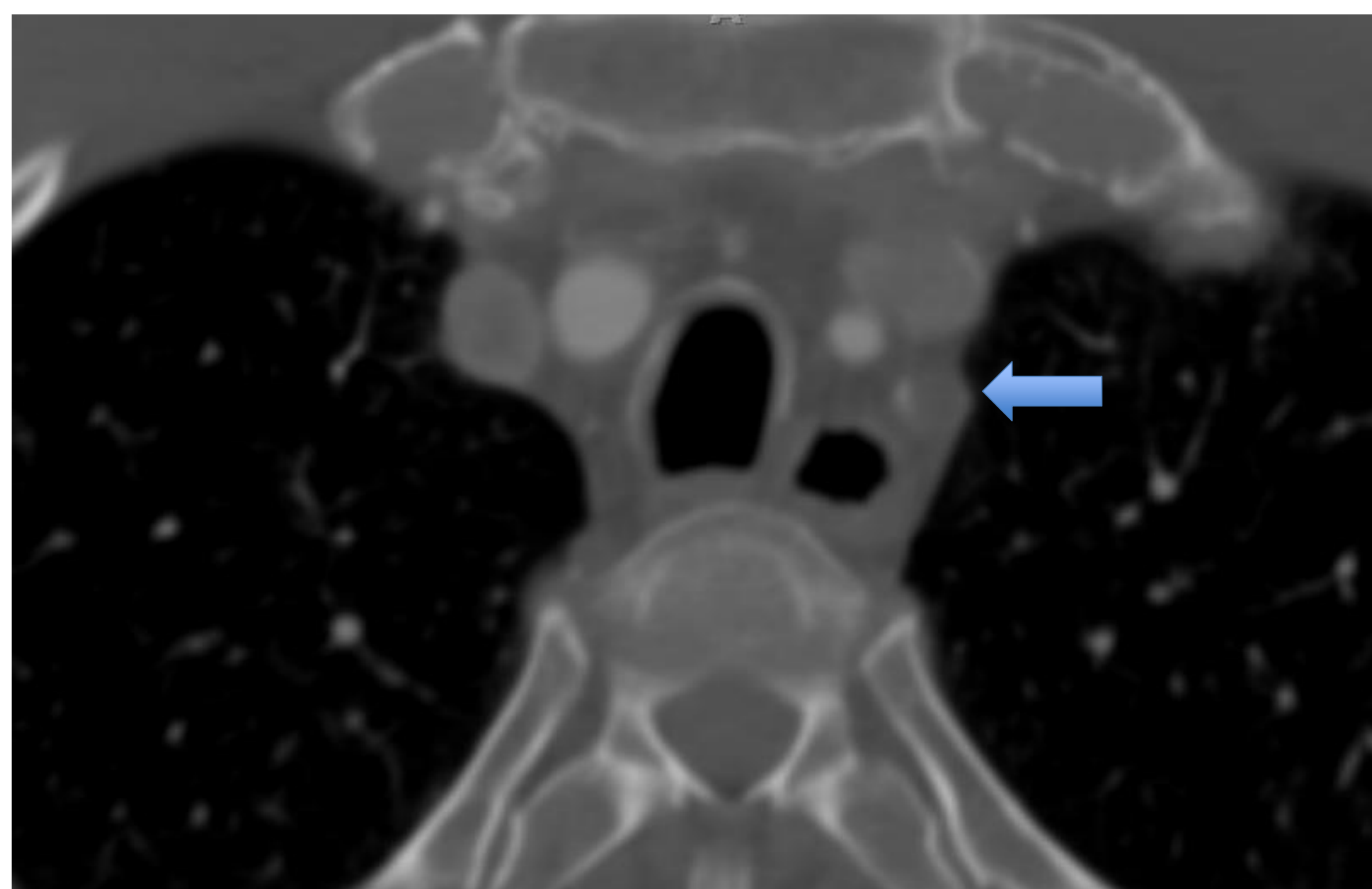
Introduction

Revascularization of subclavian artery may be indicated in clinical situations where patient has symptoms of vertebrobasilar insufficiency unresponsive to conservative therapy. Embolization into vertebral artery leading to stroke is a potential risk.

Case History

69-year-old male seen for multiple episodes of dizziness and left arm discomfort with exertion. Patient was initially treated conservatively however he failed to respond. Work-up revealed critical stenosis of the left subclavian artery. Duplex scan showed retrograde flow in the vertebral artery. Patient had symptoms with minimal exertion of left arm. After all the other causes of dizziness were ruled out decision was made to proceed with stenting of the left subclavian artery with embolic protection of left vertebral artery.

Pre Op Imaging



CT angio

Technical Details

- Left common femoral artery access was obtained
- Left brachial artery was then accessed and a 4 French sheath was placed.
- Patient was given IV heparin and therapeutic ACT was confirmed
- Selective catheterization of left subclavian artery and secure access was obtained by advancing stiff 0.035 angled glide wire to brachial artery
- The 7 fr guiding sheath was advanced close to the left subclavian artery ostium.
- Using combination of Glidewire and Kumpe catheter we accessed the left vertebral artery via left brachial artery approach. Wire was exchanged to 014 Sparta core wire.
- Left vertebral artery was then balloon occluded using 3 mm balloon gently inflated to the profile of the vessel.
- 7 French sheath was then advanced into left subclavian artery
- 7 mm x 39 mm Viabahn VBX covered stent graft was then advanced into sheath and then sheath was pulled back into thoracic aorta
- Stent graft was deployed covering the stenotic lesion of the left subclavian artery.
- After stent graft deployment vertebral artery balloon was deflated and removed.
- Completion angiogram showed resolution of stenosis and antegrade flow in the vertebral artery.
- Patient had no neurological complications

Angiogram with sheath access

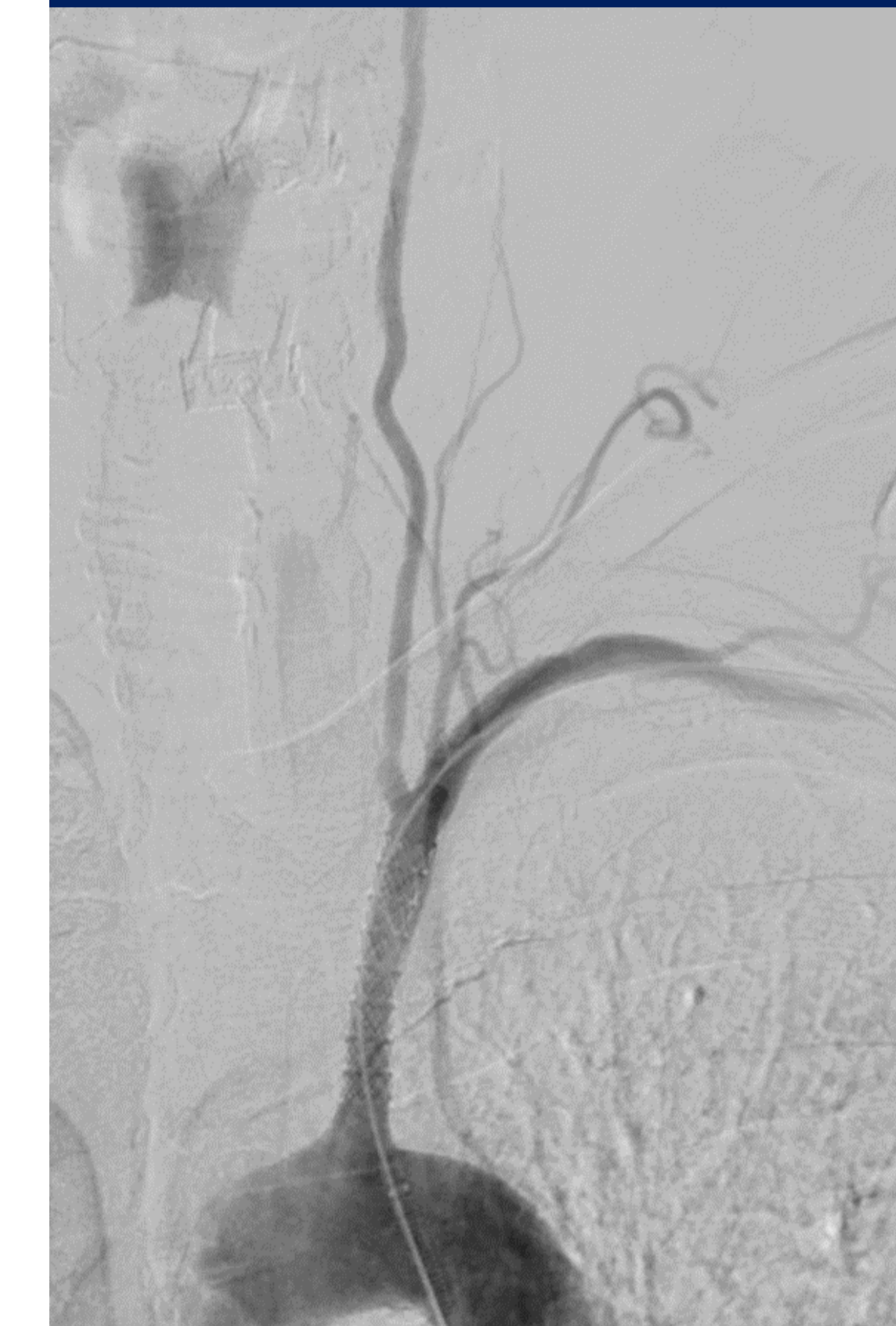


Angiogram after vertebral artery balloon placement



Results

Completion angiogram



- Primary patency decreased from 93% at 1 year to 72% at 5 years.
- Female gender, vessel size less than 7 mm and smoking are associated with early restenosis and failure
- Balloon expandable stents perform better especially in ostial lesions.
- We chose to use Viabahn VBX because it is balloon expandable covered stent graft and allows for more flexibility due to unattached balloon expandable stents
- Short term patency of stenting at one year is comparable to carotid subclavian bypass. Patency at 5 years is better for bypass compared to stenting

- Covered stent grafts have theoretical advantage of preventing intimal hyperplasia and embolization.
- Embolization into vertebral artery is a risk when antegrade flow is established therefore embolic protection should be used when feasible
- We used 4 fr access with low profile balloon to avoid brachial artery access related complications.

Conclusion

Endovascular treatment is recommended as the initial management of most symptomatic subclavian artery lesions. Embolic protection of vertebral artery is safe and should be considered if anatomically feasible. Patients with failed endovascular interventions, lesions that risk coverage of the vertebral artery, ostial occlusions, and those without an ostial stump may be considered for open surgical reconstruction.