

# Successful Management of Subclavian Artery Stenosis in an Elderly Female: A Case Study

Dolly Mathew, Shivendrran Madhurai Shanmughasundaram, Aravind Kumar

Government Medical College, Calicut

**Abstract:** 64 year old Female, with Type 2 diabetes, presented with left upper limb claudication for 3 months. On examination she was found to have a weak pulse in left upper limb. Imaging modalities showed occlusion in the proximal left subclavian artery. Percutaneous transluminal angioplasty was done to left subclavian artery after which patient became asymptomatic.

**Keywords:** Peripheral artery disease, Percutaneous transluminal angioplasty, subclavian artery stenosis, upper limb claudication, atherosclerosis.

## 1. Introduction

Peripheral arterial disease (PAD) is a partial or complete occlusion of blood flow in the peripheral vessels of the body. They result from isolated and/or combined loss of arterial elasticity, pathological platelet aggregation and increased incidence of microvascular complication, as seen in cases of hypertension, Hyperglycemia, Hyperlipidemia, Hypercholesterolemia, and smoking [1]. Diabetes mellitus has been linked to peripheral artery disease through WBC induced endothelial dysfunction [2].

The assessment of peripheral artery disease typically focuses on the evaluation of the lower extremities as clinically significant ischemic disease is less frequent in the upper extremities. However, subclavian artery stenosis is a significant form of peripheral artery disease, which is a marker of diffuse atherosclerosis and increased cardiovascular events. The incidence of subclavian artery stenosis in general population is approximately 2% to 7% [3], atherosclerosis being the most common cause [4]. Other cause being Vasculitis such as Takayasu arteritis, giant cell arteritis etc. In some cases, chest radiation for cancer treatment, subclavian artery compression by rib, etc. can also cause subclavian stenosis [5].

## 2. Case Presentation

64 year old female, known case of Type 2 Diabetes mellitus presented with complains of left upper limb claudication for the past 3 months. She found difficulty while doing ordinary household activities. She had no history of any vertigo, giddiness while doing such activities. She was found to have feeble pulse in left radial and brachial artery. Systolic blood pressure was 160 in right upper arm and 100 mm Hg in Left upper arm. Doppler was done which showed abnormal wave form with a single phase in left subclavian, axillary, Brachial, radial and ulnar arteries which was suggestive of significant proximal artery occlusion. CT upper limb angiogram showed short segment near total luminal stenosis of left proximal subclavian artery [Figure 1]. Patient was hence planned for Percutaneous transluminal angioplasty to left subclavian artery under local anaesthesia. Initially left subclavian artery was tried to hook with 6F Judkin Right 3.5. As it was not hooking, MPA catheter was tried and Left subclavian artery was wired with Fielder FC. Fielder Fc was exchanged with Amplatz stiff wire and MPA was exchanged with 8F Judkin

right catheter. After that, 7x40mm Armada Balloon was advance over the stiff wire and lesion Predilated. After adequate preparation of lesion, Express LD vascular stent 9x37mm was deployed and Post dilatation done. Final cine image showed good result (Figure 3). Post procedure patient was stable and with no symptoms.

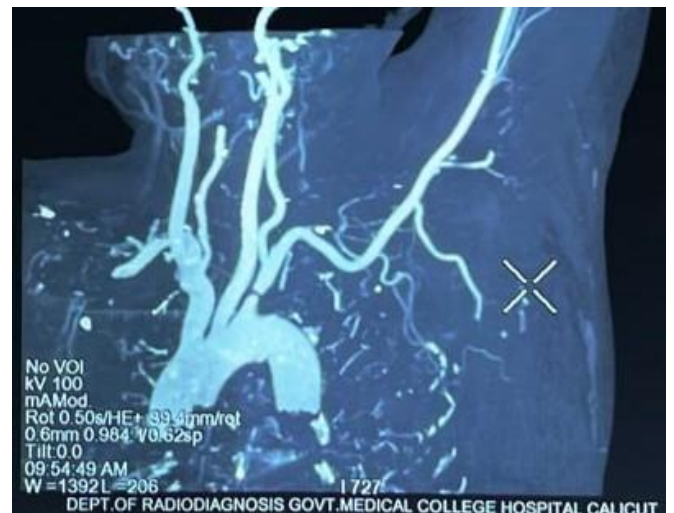


Figure 1: Proximal left subclavian artery stenosis



Figure 2: Lesion crossed with Fielder Fc coronary wire

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**Figure 3:** Final cine image

### 3. Discussion

Clinical presentation of subclavian artery peripheral arterial disease (PAD) varies from hand claudication to cerebral hypoperfusion to distal embolization and digital ischemia. Upper extremity PAD could manifest as coronary steal or lower extremity claudication in patients with CABG or extra-anatomic axillary to femoral bypass<sup>[6]</sup>.

Subclavian artery stenosis usually develops in the elderly, due to high prevalence of atherosclerotic disease in them. It is more common in the left subclavian artery with a ratio of 3:1 to 4:1, which is attributed to a sharper origin of the artery leading to an increased flow turbulence that results in accelerated plaque formation<sup>[7]</sup>. While the diagnosis typically rest on imaging, a through physical exam<sup>[8]</sup>. On examination, patient can display the following findings like unequal arm pulse, Refractory hypertension in some cases of bilateral subclavian artery stenosis, Presence of faint pulse in the upper extremity and systolic Blood pressure greater than 15mm Hg between the right and left upper extremities, absent or diminished pulses, Neurologic and cardiac sequelae, nail bed splinter haemorrhages, Ulcer, Bruits etc.<sup>[9][10]</sup>.

Doppler and duplex ultrasonography are the test of choice to diagnose subclavian artery steal syndrome and phenomenon. These techniques provide accurate information about the flow of vertebral artery<sup>[11]</sup>. Most patients with subclavian artery stenosis due to atherosclerotic occlusive plaques are asymptomatic. Intervention in managing subclavian artery stenosis is indicated in the symptomatic patient<sup>[12]</sup>.

MRI and CT angiography are alternative but are perhaps best used to quantify the degree of subclavian artery stenosis when Doppler are inconclusive, if the etiology of subclavian artery is uncertain or for planning interventions<sup>[13]</sup>.

Symptomatic patients' proximal subclavian artery occlusive disease can be successfully treated either surgically or percutaneously [14]. Balloon angioplasty and stenting can be

performed when stenting is unlikely to compromise vertebral circulation. Longer or more distal occlusion are better addressed surgically. They consist of bypass in the form of carotid-subclavian bypass, carotid transposition or axillo axillary bypass surgeries [15].

This case study aims to highlight the presentation, diagnostic process and subsequent percutaneous transluminal angioplasty of subclavian artery stenosis in an elderly female with type 2 diabetes. This case underscores the importance of recognising subclavian artery stenosis as a significant cause of upper limb claudication and the efficacy of percutaneous angioplasty of subclavian artery in its management.

### 4. Conclusion

Subclavian artery stenosis often presenting as upperlimb claudication can be effectively managed with percutaneous transluminal angioplasty. This case highlights the importance of early diagnosis and intervention in symptomatic patient with subclavian stenosis to prevent complications and improve quality of life.

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