Introduction:

Subclavian artery stenosis (SAS) is a type of upper extremity peripheral artery disease mostly commonly due to atherosclerosis. The prevalence of SAS ranges from 2% to 7%. Most of the cases of SAS are unilateral while bilateral SAS is very rare (<0.1%). The manifestations of SAS range from asymptomatic to arm claudication, paresthesia, pain, coldness and color changes of hand and digits to exercise-induced fatigue. In patients with undiagnosed SAS, it can lead to untreated hypertension that can be complicated by recurrent decompensated heart failure or can present as a pseudo-shock leading to unnecessary admissions for advanced evaluation and treatment of patient hemodynamics in the Intensive Care Unit (ICU), resource utilization, prolonged hospital stays and increased costs. We present two atypical presentations in patients with subclavian artery stenosis.

Case presentation:

The first case was a 77-year-old woman with a history of heart failure, hypertension, coronary artery disease, peripheral artery disease and hyperlipidemia with multiple admissions for pulmonary edema with respiratory failure presented to the hospital for sudden onset of dyspnea. The patient was found in severe respiratory distress with room air oxygen saturation of 60% and blood pressure in the left arm of 100/63 mm Hg. Patient's respiratory distress persisted despite intravenous furosemide and continuous positive inspiratory pressure (CPAP). The repeated blood pressure showed right arm blood pressure (220s/120s mmHg) and left arm (140s/80s mmHg). Review of chest CT angiogram to assess for pulmonary embolism showed extensive atherosclerosis with occlusion of the proximal left subclavian artery (Figure 1). Intravenous nitroglycerin was initiated along with the CPAP and furosemide. Patient had a rapid improvement in symptoms and was discharged on losartan, metoprolol, and furosemide.



Figure 1: Sagittal view from chest CTA showing extensive, obstructive atherosclerosis of the proximal left subclavian artery (arrow).

The second case was a 61-year-old woman with history of aortic stenosis, coronary artery disease, diabetes mellitus type 2, chronic obstructive pulmonary disease, hypertension, hyperlipidemia, active smoking, and hypothyroidism that presented to the

hospital for hypotension. The patient was admitted to the medical ICU for possible distributive shock and started on antibiotics, and intravenous norepinephrine. Due to apparent persistence of shock contrasted with an improved, non-toxic appearance of the patient, a search for error in hemodynamic data was undertaken. Blood pressure was assessed in all four extremities with the discovery of significantly elevated blood pressure in both lower extremities. Bilateral upper extremity arterial Doppler ultrasound confirmed severe bilateral subclavian artery stenosis (Figure 3). The patient was weaned off IV vasopressor by using lower extremities blood pressure readings and was discharged in a stable condition along with referral for subclavian artery revascularization.



Figure 2: Elevated velocities in bilateral proximal subclavian arteries with parvus tardus waveforms distally consistent with significant subclavian arterial stenosis bilaterally.

Discussion:

The diagnosis of SAS is important to reduce cardiovascular and cerebrovascular complications. Careful blood pressure assessment in all extremities should be considered in all patients with suspected SAS with follow up confirmatory study. The initial imaging study for suspected SAS is duplex ultrasound. Computed tomography angiography (CTA) or magnetic resonance angiography (MRA) can be used in patients with abnormal or inconclusive ultrasound study. The management of SAS includes risk factors modification including smoking cessation, regular physical exercise, maintaining healthy diet and weight, control of hypertension, diabetes mellitus and dyslipidemia. Revascularization with endovascular therapies or surgery can be considered in symptomatic or selected asymptomatic patients. In conclusion, in patients with the diagnosis of SAS, it is important to educate the patient and communicate to the care team which limb to use for accurate blood pressure monitoring. Referral for arterial revascularization of SAS is recommended for symptomatic patients.