

A Case of Subclavian Artery Thrombosis in Primary Care

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Abstract

Subclavian artery thrombosis is a rare cause of upper limb ischemia resulting from occlusion of the upper extremity blood supply. The exact incidence or prevalence of subclavian steal syndrome is unknown, most literature reports the prevalence of SSS as between 0.6% to 6.4% [9]. Symptomatic presentation is quite rare and a high suspicion of index is required for its diagnosis in primary care setting. It is imperative to diagnose the condition early in order to avoid the complications. Possible catastrophic clinical consequences necessitate prompt rectification of the underlying disease and risk factors. Treatment modalities are often selected depending on the severity of clinical presentation, while modification of secondary risk factors in primary care is often sufficient among the asymptomatic patients. We report a case of a 70 years old female patient in primary care who presented with decreased appetite, intermittent diarrhea and 3 kg weight loss over 3 months and on physical exam discrepancy of blood pressure measurements was found in both arms. She was advised CT-angiogram which showed Subclavian artery thrombosis.

Keywords: Subclavian artery occlusion; upper extremity thrombosis; primary care

Introduction

The right and left upper extremities receive arterial blood from the subclavian arteries. The right subclavian artery originates from the bifurcation of the innominate artery, whereas the left subclavian artery originates from the arch of the aorta. The prevalence of subclavian artery thrombosis is less than 1%, and the identification of the condition in a primary care context requires a high index of suspicion. Early diagnosis of the illness is essential to preventing complications. On the first visit, a hypertensive patient's blood pressure could be easily measured in both arms. A difference of 20mm Hg blood pressure is significant, and should prompt a work up for subclavian stenosis syndrome. The bedside screening among such patients can be done by using a duplex ultrasound [10] Compared to its right counterpart, the left subclavian artery is four times more likely to thrombose. It is recognized that clinical symptoms result from decreased blood supply to the upper extremity.

Case Presentation

A 70 years old female, known diabetic, hypertensive presented with decreased appetite, intermittent diarrhea and 3 kg weight loss over a period of 3 months, with a documented discrepancy of blood pressure monitoring in both arms, done at home. Her regular medications included:

Captopril 25mg once daily.

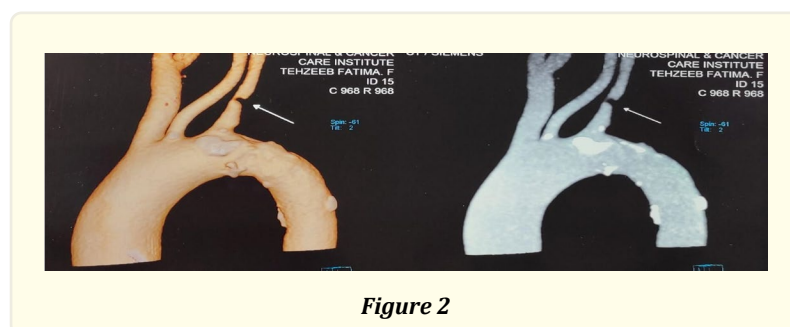
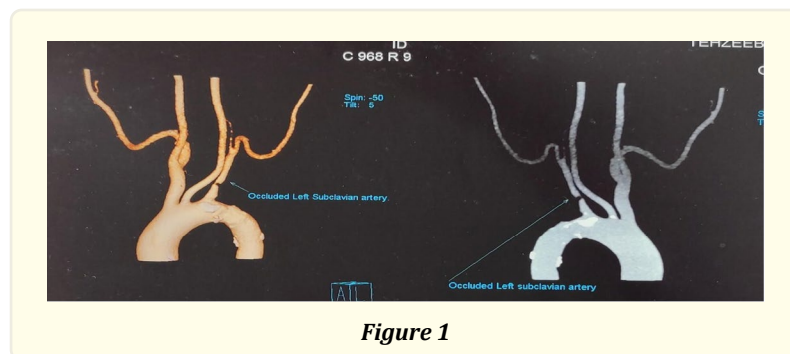
Sitagliptin-metformin 50/ 500mg twice daily.

Paroxetine 10mg once daily.

On examination, she was an elderly female with a typical height and build, 170/60 in her right arm, and 100/80 in her left arm. The pulse rate was 80 beats/ min, regular. She was afebrile with normal saturation. There were no heart murmurs or peripheral cyanosis; capillary refill time was less than 2 seconds. Examination of respiratory system was normal.

Investigations:		Normal range
Hemoglobin	12.3 g/ dl	11.5 – 15.5 g/dl
White blood cells	4.9	4.0 – 11.0 10 ⁹ /L
Platelets	142	150 – 400 10 ⁹ /L
Glycated Hemoglobin	7.98 %	< 6.5%
Creatinine	0.9 mg/dl	0.5- 1.5 mg/dl
LDL	110 mg/dl	<100 mg/dl in CAD
Triglycerides	108 mg/dl	70 – 150 mg/dl
Vitamin D	16.84 units	< 30 = vitamin D deficiency
*Urine analysis		Glycosuria, no proteins, no blood
*Electrocardiogram		did not reveal any abnormalities.

She was advised to monitor BP at home and the discrepancy between both arms persisted for which she was advised CT angiogram; which showed Left Subclavian artery thrombosis (figure 1 & 2). Subsequently, she was referred to the cardio thoracic surgery department for further management.



Discussion

Systemic lesions typically affect 1% of the population, and disparity of blood pressure in both upper extremities due to thrombosis of the subclavian artery is fairly rare [1]. Our literature search has not turned up any primary care practises reporting this condition. As was observed in our situation, the left subclavian artery is four times more likely to thrombose than the right subclavian artery.

Obesity, hypertension, trauma, diabetes, and smoking are major risk factors for thrombosis [1, 2]. Coexisting hypercoagulable conditions, shear stress, or injury to the vessel's intima cause occlusion. Platelet aggregation and the release of platelet-derived growth factors are encouraged by the underlying damage [1]. An atherosclerotic plaque develops as a result of the proliferation of smooth muscle cells.

Atherosclerosis is the most frequent cause that promotes thrombosis [1]. The carotid-subclavian and carotid-vertebral regions likely to be where atheroma development most frequently occurs [3, 4]. Clinically sneaky, atherosclerotic occlusion only manifests as symptoms after a critical level of occlusion is reached. Additionally, regional anatomical anomalies, strenuous exercises, and enlarged muscles might cause subclavian thrombosis. If this is the case, external compression and shear cause damage to the intimal wall [3]. Less frequent causes include neurofibromatosis, radiation exposure, autoimmune vasculitis, fibro-muscular dysplasia, and radiation exposure [4].

Most patients with subclavian artery stenosis have no symptoms. It can occasionally be discovered by chance when there is a discrepancy in blood pressure between the arms or when individuals with coronary or carotid artery disease undergo ultrasonography testing [11].

The start of clinical signs denotes the existence of collateral blood flow. Symptoms typically include finger necrosis, arm claudication, muscle weariness, and soreness when at rest [1]. Affected limbs with acute occlusion typically exhibit discomfort, coldness, and pulselessness [3]. Vertebrobasilar insufficiency is the presenting symptom of subclavian artery thrombosis that originates close to the vertebral artery's origin. Diplopia, syncope, ataxia, drop episodes, vertigo, dysarthria, dizziness, nystagmus, tinnitus, and facial sensory impairments are some of the neurological symptoms of vertebrobasilar insufficiency. An examination of the heart may reveal that the blood pressure in both arms is not equal [1]. The results of a pulse examination show that the affected side's axillary, radial, and brachial pulses are absent or weak. Occlusive disease can also be found by palpating and auscultating the bilateral carotid arteries. Palpation and auscultation for paraclavicular bruits should be used to check the subclavian arteries in the supraclavicular fossa. In situations with a late diagnosis, additional clinical signs can be detected, such as gangrenous skin changes on the fingers and splinter haemorrhages in the nail beds [1]. Gangrenous limb and basilar stroke are two of the subclavian artery thrombosis consequences that occur most frequently [1]. The gold standard for diagnosis is still imaging [2].

However, a complete blood count, prothrombin time, antithrombin III levels, alpha-macroglobulin levels, plasminogen levels, clotting factors, protein C/S, Factor V Leiden, and factor II C20210-a levels should be part of the patient's first workup [3]. Typically, lab investigations are not definitive. For noninvasive imaging, duplex ultrasonography with colour flow is the method of choice. When an intervention is necessary, computerd tomography, angiography and magnetic resonance angiography are required [1]. Multidetector computed tomography is very helpful in identifying anomalies in the thoracic outflow. A venous runoff should also be looked into because there is a chance that subclavian vein thrombosis will also be present. To rule out potential origins of arterial thrombi, an echocardiography should also be performed [3].

Only symptomatic patients should receive therapeutic intervention.

Aspirin, clopidogrel, statins, angiotensin-converting enzyme inhibitors, and/or angiotensin receptor blockers are examples of medical treatments [1]. One of the alternatives available to symptomatic patients is an open surgical bypass. Extra-anatomic revascularization is the procedure of choice for surgical correction most frequently (e.g., carotid transposition, carotid-subclavian bypass) [11].

Our patient was presented without any specific symptoms. Unequal blood pressure in both arms was the only clue guiding towards the diagnosis. We believe that our patient was prone to the development of a right subclavian thrombus because of a persistent history of uncontrolled diabetes and an uncontrolled diet. Our instance makes it very clear that conditions like diabetes, hypertension, and hyperlipidemia put a person at risk for thrombosis. As a result, we advise that in a primary care setting, blood pressure monitoring be performed in both arms on the patient's initial visit if they are suspected of having hypertension, with a high threshold of suspicion for SSS in patients who have a difference of 15-20 mmHg in both arms. Additionally, these risk factors must be appropriately controlled in primary care. Additionally, the patient has to receive thorough education and counselling regarding the effects of uncontrolled hypertension on the development of atherosclerosis. Strict glycemic control must be maintained in diabetics.

Conclusion

In primary care, subclavian artery thrombosis is underdiagnosed and rarely symptomatic. It is known that co-existing numerous risk factors, such smoking and uncontrolled diabetes, might hasten the underlying pathology. Our instance emphasizes the significance of effectively controlling the underlying risk factors in addition to the necessity of early medical and surgical therapies.

Learning Points

1. Measure the BP in both arms on the first visit. If there is a difference of > 5mmHg use the arm with the higher reading for future measurements.
2. Optimal control of risk factors like hypertension and diabetes.
3. Thorough history and examination for the screening of such cases.
4. Proper patient education regarding the consequences of uncontrolled hypertension and suboptimal glycemic control.
5. An interprofessional approach with good communication between the primary care physician, the neurologist, the radiologist, and the vascular surgeon is essential to recognize and treat this condition.

References

1. Ateeq Mubarak and Arshad Muhammad Iqbal. "Subclavian artery thrombosis". StatPearls [Internet] (2020).
2. Ochoa VM and Yeghiazarians Y. Subclavian artery stenosis: A review for the vascular medicine practitioner. *Vasc Med* 16 (2010): 29-34.
3. Mary C Mancini, et al. Subclavian artery thrombosis. (2020).
4. Zimmerman NB. "Occlusive vascular disorders of the upper extremity". *Hand Clin* 9 (1993): 139-150.
5. English JA, et al. "Angiographic prevalence and clinical predictors of left subclavian stenosis in patients undergoing diagnostic cardiac catheterization". *Catheter Cardiovasc Interv* 54 (2001): 8-11.
6. Osborn LA, et al. "Screening for subclavian artery stenosis in patients who are candidates for coronary bypass surgery". *Catheter Cardiovasc Interv* 56 (2002): 162-165.
7. Lobato EB, et al. "Incidence of coronary-subclavian steal syndrome in patients undergoing noncardiac surgery". *J Cardiothorac Vasc Anesth* 15 (2001): 689-692.
8. Angle JF, et al. "Percutaneous angioplasty and stenting of left subclavian artery stenosis in patients with left internal mammary-coronary bypass grafts: clinical experience and long-term follow-up". *Vasc Endovascular Surg* 37 (2003): 89-97.
9. Tan TY, et al. "Subclavian steal syndrome: can the blood pressure difference between arms predict the severity of steal?". *J Neuroimaging* 12.2 (2002): 131-5.
10. Mousa AY, et al. "Validation of subclavian duplex velocity criteria to grade severity of subclavian artery stenosis". *J Vasc Surg* 65.6 (2017): 1779-1785.
11. Shankar Kikkeri N and Nagalli S. Subclavian Steal Syndrome (2020).