Isolated Subclavian Artery Thrombosis

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Abstract
We presume this case to highlight the importance of underestimated percutaneous angioplasty with stent in isolated subclavian artery thrombosis.

Introduction
Occlusive disease that involves the subclavian and brachiocephalic arteries is relatively uncommon. The left subclavian artery is more frequently involved than the right, and most lesions involve the ostial segment. Minimally invasive endovascular techniques have become an important tool in the management of symptomatic patients. Angioplasty and stenting have been reported as a viable therapeutic option, producing good technical success and durability.

Case Report
56 years old male, an electrician, noticed numbness of the left arm, paraesthesia, and pain brought on by working overhead with his left arm. He had vertigo off and on for four years. He had noticed cold fingers in the left hand and occasional numbness. Turning his head to the left brought on dizziness and aggravated his symptoms. There was no history of change in colors of the fingers, no history of digital infarcts/ulcerations. There was no history of hypertension, diabetes or ischemic heart disease. He is chronic smoker consuming around 20 cigarettes per day for last 15 years. On examination his left radial and brachial pulse was feeble with all other peripheral pulses being normal. Blood pressure in right arm was 130/80 mm Hg while in left arm was 70 systolic. He had no pallor/rash. No evidence of digital infarcts/ulcerations. Examination of cardiovascular system was unremarkable and there was no audible renal bruit. Systemic examination was within normal limits.

His routine blood tests (CBC, blood sugars, renal function tests) were normal. His upper limb arterial Doppler showed monophasic waveforms. Aortography, using percutaneous femoral artery puncture by the Seldinger technique, showed obstruction to the left subclavian artery with reversed flow down the left vertebral. It showed occlusion of the left subclavian artery from its origin to the origin of the vertebral artery, which was filled retrogradely from the right vertebral artery. The other arch vessels showed changes of atherosclerosis (Figures 1 and 2).

His ANA, pANCA and cANCA were negative. ECG and 2D ECHO were normal. Serum homocystiene levels were raised 68 μmol/L.

Subclavian artery angioplasty was performed in an antegrade fashion from the femoral artery using 8 Fr guiding catheters (Figure 3). Balloon predilatation was performed and single stent implantation was successfully performed. The angiographic success rate was 100%. There were no procedure-related complications. Patient received clopidogrel for 4 weeks following the procedure. The difference in blood pressure between both arms was <10 mmHg at the time of hospital discharge.

Discussion
Occlusive disease that involves the subclavian and brachiocephalic arteries is relatively uncommon. Causes include atherosclerosis, Takayasu arteritis, giant cell arteritis, fibromuscular dysplasia (FMD), and radiation-induced arteriopathy; of these, atherosclerosis is the most frequent cause. The critical points of diagnosis (apart from awareness of the condition) are differentiation of the pulses in the two arms and adequate radiography. Accurate anatomical localization of the site of obstruction and demonstration of the reversed vertebral flow is only possible by performing aortography. There is a paucity of data in the literature regarding the natural history in patients with subclavian artery occlusive disease. The clinical presentation depends on the vessel involved and severity of disease. Symptoms may reflect upper-extremity ischemia, such as arm or hand claudication, paresthesia, or rest pain. Unfortunately, there is no level
I evidence on the ideal management of subclavian artery occlusive disease. Upper extremity discomfort with activity, vertebrobasilar insufficiency secondary to vertebral artery steal, and angina pectoris associated with coronary steal syndromes are well-accepted indications for transcatheter intervention or surgical reconstruction. Balloon angioplasty and stenting are associated with high rates of success and better outcomes than balloon angioplasty alone, which makes endovascular stenting an alternative to open surgery in patients with obstructive disease of the subclavian or brachiocephalic arteries. Stone, et al determined that endoluminal therapy for subclavian disease is effective and safe; however, open surgery still carries a better long-term durability and should be the preferred approach in low-risk patients. Estimated patency rates of percutaneous transluminal angioplasty at 2 and 5 years were 100% and 85.7%, respectively.

Great care, especially in the elderly must be taken, and retrograde percutaneous femoral artery puncture is to be preferred to the brachial route, as post angiography thrombosis of the subclavian artery on the non-affected side may provoke bilateral vertebral, and consequent basilar, artery thrombosis as well as upper limb ischemia. Even the hypertonic contrast medium may provoke ischaemic symptoms. If these patients are being investigated, facilities for rapid surgical treatment either of the lesion itself or of complications of the investigation must be available.

Percutaneous subclavian angioplasty and stent implantation to the left subclavian artery stenosis restored normal flow to the left hand in our patient with abolition of symptoms. To summarise, percutaneous treatment of subclavian artery stenosis is less invasive, has lower complication rates and has a shorter hospital stay than surgical treatment. When an intervention is indicated, a percutaneous approached is favoured over surgical intervention in the current era of angioplasty and stenting. Both the immediate results and the long-term outcomes after balloon dilatation and stenting for stenotic lesions are excellent. More data and long term follow up studies are needed in order to come to a definitive management plan for isolated subclavian artery thrombosis.

References

Fig. 3: Post-procedure restoration of flow