An unusual case of hypertensive diastolic heart failure with bilateral subclavian artery stenosis

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Severe stenosis or occlusion of the subclavian artery is a rare clinical finding, even more so for bilateral existence of the condition. Subclavian artery stenosis and occlusion leads to erroneously low blood pressure values when measured at the brachial artery on the ipsilateral side. Widespread clinical reliance on a sole brachial measurement of blood pressure, particularly in the emergency room setting, may result in inappropriate clinical management in patients with conditions that alter brachial blood pressure. Currently, there is no published English-language literature on the implications of bilateral subclavian artery stenosis and occlusion in heart failure. A case of an apparently hypotensive patient with frequent emergency room visits for symptoms of heart failure exacerbation is presented.

Key Words: Blood pressure; Congestive heart failure; Subclavian artery stenosis

Severe stenosis or occlusion of the subclavian artery is a rare clinical finding, even more so for bilateral existence of the condition (1-3). Subclavian artery stenosis and occlusion leads to erroneously low blood pressure values when measured at the brachial artery on the ipsilateral side. Widespread clinical reliance on a sole brachial measurement of blood pressure, particularly in the emergency room (ER) setting, may result in inappropriate clinical management in patients with conditions that alter brachial blood pressure. To the best of our knowledge, there is no published English-language literature on the implications of bilateral subclavian artery stenosis and occlusion in heart failure. A case of an apparently hypotensive patient with frequent ER visits for symptoms of heart failure exacerbation is presented.

CASE PRESENTATION

A 71-year-old woman with known diastolic congestive heart failure (CHF) presented to the ER with exacerbation of CHF and a decreased level of consciousness. Brachial blood pressure (BP) was measured at 55/40 mmHg. The patient had four recent admissions with exacerbation of CHF. Her medical history was also significant for autoimmune hepatitis, but preserved liver function; esophageal varices with a bleeding episode; and long-term corticosteroid therapy complicated by adrenal insufficiency, type 2 diabetes mellitus and osteoporosis.

Recent echocardiography had revealed moderate concentric left ventricular hypertrophy with diastolic dysfunction, and mild to moderate mitral regurgitation. Cardiac catheterization in a recent admission demonstrated 50% stenosis in the second diagonal artery, with

Cas rare d'insuffisance cardiaque diastolique hypertensive avec sténose bilatérale de l'artère sous-clavière

La sténose grave ou l'occlusion de l'artère sous-clavière est une observation clinique rare et encore plus lorsque la maladie se manifeste bilatéralement. La sténose et l'occlusion sous-clavières entraînent des valeurs de tension artérielle faussement basses lorsqu'on les mesure au niveau de l'artère brachiale ipsilatérale. En clinique, comme on se fie uniquement à la mesure de la tension artérielle brachiale dans la plupart des cas, et particulièrement dans les services d'urgences, la prise en charge clinique pourrait s'en trouver inappropriée chez les patients qui souffrent d'une maladie susceptible de fausser la mesure de la tension artérielle brachiale. Rien n'a encore été publié en langue anglaise sur les implications de la sténose et de l'occlusion bilatérales de l'artère sous-clavière dans l'insuffisance cardiaque. On présente ici le cas d'un patient en apparence hypotendu qui s'est présenté à l'urgence à de multiples reprises pour des symptômes d'exacerbation de son insuffisance cardiaque.

mild diffuse disease in the other coronary arteries. Right ventricular endomyocardial biopsy had ruled out myocarditis and infiltrative cardiomyopathies, but healing ischemic microinfarcts with atheroemboli were observed. Previous BP values were also low; systolic BP was between 60 mmHg and 65 mmHg, and diastolic BP was between 40 mmHg and 45 mmHg.

Following intubation, dopamine was started for hypotension management and was later replaced with noradrenaline. The patient developed atrial flutter but successfully converted to sinus rhythm with two direct current electric shocks. Cardiology consultation resulted in admission to the coronary care unit (CCU). On admission to the CCU, BP was measured at 56/36 mmHg in the left arm but was not detectable in the right arm. An arterial line was inserted via the femoral artery, and BP was measured at 191/92 mmHg. BP values were consistently much higher through the femoral arterial line than the cuff on the arms, and was higher in the left arm than in the right arm. For instance, on the first day post-CCU admission, BP at one point was measured at 170/80 mmHg through the arterial line, while cuff readings on the arms were 83/74 mmHg on the left and 60/39 mmHg on the right arm. To investigate the inconsistency between brachial and femoral BP values, a computed tomography (CT) scan of the thorax was obtained using 1.25 mm slices, both before and after intravenous contrast injection with sagittal and coronal planar reformatting of maximum-intensity projection images. Analysis of the initial unenhanced CT images showed densely calcified plaque or thrombus at the origins of both subclavian arteries and the right common

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Figure 1) Coronal reformat maximum-intensity pixel image from a contrast-enhanced computed tomography scan of the thorax. Arrows indicate proximal occlusion of the right subclavian artery with vertebral artery collateral flow and absence of contrast in the right common carotid artery, and a tight stenosis at the origin of the left subclavian artery

carotid artery. The CT angiogram showed absence of flow in the right subclavian artery, a very tight stenosis at the origin of the left subclavian artery and a tight stenosis at the origin of the right common carotid artery. Both vertebral arteries showed normal calibre and flow (Figure 1).

Further management following the insertion of the femoral arterial line was based on femoral BP readings with diuretics and BP-lowering agents. The patient was eventually discharged in stable condition. She remained stable during the eight months between discharge and the

time the present report was written, without further exacerbation of CHF or related ER visits.

DISCUSSION

The existence of rare bilateral occlusion and severe stenosis of subclavian arteries in the present patient was masked by the concomitant presence of CHF, which was the most plausible cause of low BP values. In retrospect, it appears to be clear that the low brachial BP values were indeed due to subclavian artery occlusion and stenosis, and did not accurately reflect the systemic BP. Low brachial BP readings in the previous admissions also precluded administration of antihypertensive agents, a crucial component in the optimal management of CHF. Untreated hypertension, which was the real ongoing issue, resulted in multiple further admissions until it was diagnosed and properly managed.

CONCLUSION

The present case demonstrates how a rare clinical entity can be easily masked by a much more common, better-recognized, concomitant clinical diagnosis. It also emphatically underscores the importance of BP measurement in all extremities, especially when brachial BP values and the clinical picture do not match well. Unfortunately, however, common clinical practice relies much more frequently on BP measurement from upper extremities only, and even then, brachial BP is quite often measured on one side. Finally, the paramount role of medical imaging techniques in complicated clinical presentations is, once again, exemplified in the present brief clinical case report.

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