Ir Med J; November-December 2023; Vol 116; No. 10; P881
14th December, 2023

The breathless patient with a sore neck

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Abstract

Presentation
We present a case of 69-year-old man with severe ischaemic cardiomyopathy and an ICD in situ who presented with a 1-week history of severe neck pain and markedly increased dyspnoea.

Diagnosis
Chest x-ray revealed a new raised left hemi-diaphragm. USS confirmed paralysis with paradoxical movement. CT neck revealed marked left sided spondylosis from C3-C5.

Treatment
He was deemed unfit for cervical decompression. He later underwent left hemi-diaphragm plication with good relief of dyspnoea.

Discussion
Cervical spondylosis is an extremely rare cause of phrenic nerve palsy but may go unrecognized. Surgical decompression is the treatment of choice. Plication of the diaphragm provided good symptom relief.

Introduction

Phrenic nerve palsy has a myriad of causes; idiopathic, traumatic, compressive, infectious, inflammatory, malignant and iatrogenic[1]. In this report we describe an elderly man with an unusual cause and treatment of a left phrenic nerve palsy.

Case Report

A 69-year-old man presented with a 3-week history of severe neck pain and very poor exercise capacity limited by dyspnoea. He was an ex-30 pack year smoker. He had a history of ischaemic cardiomyopathy and had an ICD inserted in 2011 for an ejection fraction (EF) of 25%.

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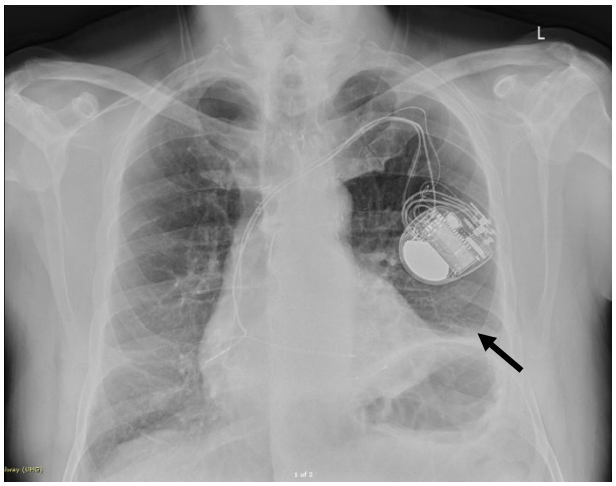
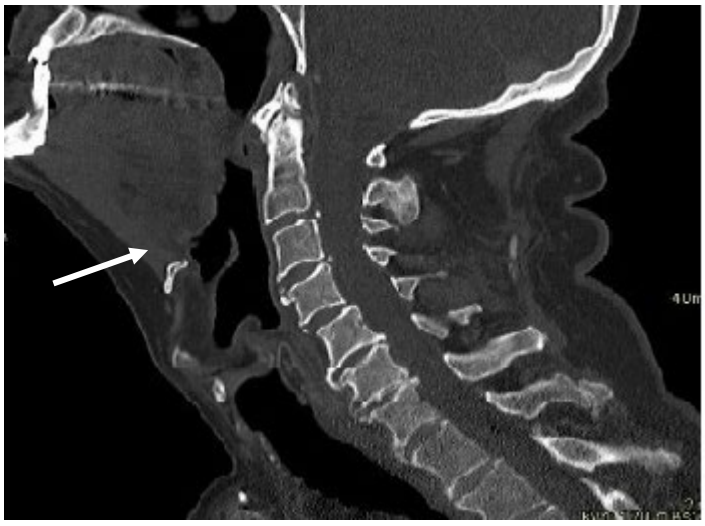
On examination his BMI was 30. 0_2 saturation was 94% on room air. There was gross left deltoid wasting and air entry at the left base was markedly decreased.
Repeat echocardiogram revealed an EF of 20% with left ventricular hypertrophy (LVH). His lung function revealed moderate COPD with an FEV1 79% predicted, FVC 97% predicted and a ratio of 63%. TLCO was 51% predicted and KCO 85% predicted suggesting extra-pulmonary restriction. His chest X-ray illustrated a new raised left hemidiaphragm (Figure 1).

Figure 1: Chest x-ray at presentation



Ultrasound confirmed paradoxical movement of the left diaphragm (arrow)[2]. CT thorax excluded lung cancer and other malignancy. Neck CT revealed marked spondylosis, particularly on the left at C3,4,5 (Figure 2). MRI-neck was not performed as his ICD was not MRI-compatible.

Figure 2 -marked spondylosis at C3,4,5:



Decompression disc surgery was not performed in view of his high risk for general anaesthesia. Nine months later he underwent a VATS left diaphragm plication. At present he can walk 200m without stopping. Chest x-ray reveals no change. Lung function 7 months post-plication reveals severe restriction with a total lung capacity of 53% and an FEV1 and FVC of 57% predicted with a ratio of 77%. He couldn't perform gas transfer.

Discussion

The patient had profound dyspnoea due to markedly reduced EF, moderate COPD and a paralysed left hemidiaphragm. The reduced negative pressure in the thorax on inspiration may also reduce venous return to the right atrium. Cervical spondylosis is a very rare cause of phrenic nerve palsy. Previous literature reviews confirmed only 12 previous cases[3,4]. Ten underwent surgical decompression with some recovery of phrenic nerve function in 8 patients. Interestingly, O'Beirne et al, looked retrospectively at MRI necks of 15 idiopathic cases and the cervical spondylosis at C3-5 was significantly worse on the ipsilateral side of the diaphragmatic palsy[5].

Diaphragm plication is rarely performed. The indication in adults is symptomatic dyspnoea. Here the hemidiaphragm is plicated from medial to lateral with a series of 6–8 parallel sutures which create "rucks" in the diaphragm until it tightens and flattens. Li et al reviewed 36 plicated patients over 24 years. There were no surgical deaths and mean lung function showed an improvement in FEV1 of 24.3 % and FVC of 26.8 % at 6 months post-operatively. 86% also had symptom improvement[6]. Our patient's lung function has become very restricted post-plication and yet he was less dyspnoeic. He has not done a pulmonary rehabilitation program. Our only possible explanation for this is the plicated diaphragm would no longer be moving paradoxically and venous return to the right heart may have increased due to the more favourable diaphragm mechanics. He may have been particularly preload dependant due to his LVH. There was no significant change in his BMI between the two breathing tests and he had not developed interstitial lung disease or diffuse neuromuscular weakness.

In conclusion, we present an unusual case of left phrenic nerve palsy. A higher index of suspicion is required for cervical spondylosis as a cause for phrenic nerve palsy. Diaphragm plication is rarely performed, however, despite a deterioration in lung function, it led to significant symptomatic benefit in our patient.

Declarations of Conflicts of Interest:

None declared.

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