Bilateral pneumothorax after pacemaker placement “Buffalo chest”

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**ABSTRACT**

Bilateral pneumothoraces following unilateral subclavian vein cannulation is a rare complication. It is usually associated with an intrapleural communication which can be congenital or formed following cardiothoracic and mediastinal surgeries, or trauma. The term Buffalo chest was used to define a single chest cavity with no anatomic separation of the two hemithoraces. It is called Buffalo chest because this unique chest anatomy of the American buffalo, or bison, helped hunters to kill them with a single arrow to the chest because the resultant pneumothorax could collapse both lungs. In distinction, the pleural cavities in humans are entirely separated.

We describe an 83-year-old female without prior history of cardiothoracic surgery, trauma or lung disease, who underwent dual chamber pacemaker placement using a left subclavian vein access and developed bilateral pneumothoraces following the procedure. The bilateral pneumothoraces were completely resolved with single left-sided thoracostomy tube placement suggesting the patient had “Buffalo chest”.

1. Introduction

Bilateral pneumothoraces as a complication of unilateral subclavian central venous line placement is an uncommon occurrence. This report is a case of bilateral pneumothoraces following left subclavian pacemaker placement in a patient without prior Pulmonary disease, Chest surgery or trauma, resolving after unilateral thoracostomy tube placement suggesting “Buffalo chest” [1,2].

2. Case report

An 83-year-old African American female with a history of symptomatic intermittent complete heart block, paroxysmal atrial fibrillation, hypertension, and carotid artery disease with no history of prior cardiothoracic surgery, underwent dual chamber permanent pacemaker placement using the left subclavian vein as an entry site. Chest X-ray done before the procedure showed no evidence of pneumothorax. The left subclavian vein was cannulated, and the atrial and ventricular leads were inserted, advanced and secured without difficulty under fluoroscopy with good pacing and sensing. There was no attempted right subclavian vein cannulation. The introducer needle did not cross the midline, and the left subclavian vein was cannulated on the first attempt. During and after the procedure no pneumothorax was identified on fluoroscopy and the patient denied dyspnea or chest pain during or directly after the procedure. She was admitted to the hospital overnight for cardiac monitoring. The next morning, she developed dyspnea and chest pain with deep inspiration. On physical exam she had diminished breath sounds bilaterally. Chest X-ray showed a 35% pneumothorax on the left side and 20% pneumothorax on the right (Image 1). Chest computed tomography (image 2) confirmed the bilateral pneumothoraces and did not show any evidence of atrial leads perforation. Echocardiogram was performed which showed no pericardial effusion or tamponade.

A left-sided chest tube was then placed and put to suction with repeat chest X-Ray showing complete resolution of both pneumothoraces over the next few days. Chest X-Ray obtained following removal of chest tube showed complete resolution of both left and right pneumothoraces. We suspect the patient had a congenital “Buffalo chest”.

2. Discussion

Unilateral pneumothorax development can be a complication of pacemaker placement, central venous catheter insertion and various cardiothoracic surgeries and Trauma. Contralateral pneumothorax after pacemaker placement was also reported before and most cases are due to atrial lead perforation which can be detected by CT chest [3] bilateral pneumothoraces however is a sporadic occurrence after unilateral central venous cannulation [4]. Potential causes of bilateral pneumothoraces following subclavian venous cannulation procedure include: (a) the preexisting pneumothorax on the contralateral side; (b)
a possible puncture of the contralateral pleura if the introducer needle "crossed midline"; or (c) by atrial lead perforation. These causes were all ruled out in our patient [5]. The existence of direct inter pleural communication can be congenital or iatrogenic due to prior cardiotoracic surgery or Trauma. Such communication can be another suggested explanation [6]. Pneumothorax after subclavian vein access may be acute and detected during procedure with fluoroscopy or can be delayed (subacute) occurring up to 48 hours after the procedure. The diagnosis of “Buffalo chest” can be made by complete resolution of bilateral pneumothoraces with unilateral chest tube placement [7,8].

3. Conclusion

Awareness of the possibility of this unusual pleural communications is important in a patient with prior sternotomy [9] when subclavian, internal Jugular vein catheterization or lung biopsy [10] is planned with caution to closely monitoring the patient for development of any respiratory distress during and after the procedure for increased possibility of bilateral pneumothorax and tension pneumothoraces [11].

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