

Contra-lateral Haemopneumothorax and Pneumopericardium Following Dual Chamber ICD Implantation via the Cephalic Vein

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Abstract

We present a case of contra-lateral haemopneumothorax and pneumopericardium following a dual chamber ICD implantation using the cephalic vein. The explanation lies in the use of an active fixation atrial (screw-in) lead and not the route of venous access. One should inspect for pneumopericardium when a pneumothorax is present on the CXR and look for right sided pneumothorax even when the cephalic vein was used for access.

Introduction

Ipsilateral pneumothorax and pericardial effusion are recognised complications of cardiac device (pacemaker/ICD) implantation. Contra-lateral pneumothoraces as well as pneumopericardium are rare complications. We report a case of contra-lateral haemopneumothorax and pneumopericardium following dual chamber Implantable Cardioverter Defibrillator (ICD) insertion using the cephalic vein.

Case Presentation

An 82 year old man with ischaemic heart disease and severely impaired left ventricular systolic function presented with shortness of breath. A 12 lead ECG documented ventricular tachycardia which spontaneously terminated. He subsequently underwent implantation of a dual chamber ICD. The pacing leads were inserted via the left cephalic vein. A right ventricular screw-in lead (Durata 7120Q, St Jude) placed into the right ventricular apex and a screw-in right atrial lead (Optisense Optim 1999TC, St Jude) was inserted into the right atrial appendage. These leads were connected to an ICD generator (Ellipse DR CD2277-36Q, St Jude) which was then placed in the left prepectoral pocket. The next day pacemaker checks revealed normal pacing parameters but the chest X-ray showed a right haemopneumothorax on the posterior-anterior film and on the lateral film there was evidence of pneumopericardium (Figure 1). Transthoracic echocardiogram revealed no pericardial effusion. The patient described some breathlessness. The haemopneumothorax was treated with a chest drain and the patient made an excellent recovery. All pacing parameters remained stable and the atrial lead was not repositioned. Figure 2 shows a follow-up CxR at one month.

Discussion

Pneumothorax and pericardial effusion are recognised complications of cardiac device implantation [1]. Rarely, a contra-lateral

pneumothorax can occur by way of right atrial screw-in lead perforation (contralateral to the venous access site) [2]. This can happen due to either macro or micro perforation of the atrial wall causing bullae to rupture with subsequent development of pneumothorax. If there is a connection between the lung and the pericardial space as result of the perforation, air can enter the pericardial space and cause a pneumopericardium as was the case here. At the same time too, it is possible for the helix and the lead tip to have plugged the small defect caused by perforation and therefore preventing a pericardial effusion as we did not observe any pericardial effusion on transthoracic echocardiogram [3]. Atrial screw-in leads have a 2.4% acute lead complication rate which includes perforation, lead displacement and pericarditis [4]. Only one isolated pneumopericardium and contralateral pneumothorax following subclavian vein puncture has previously been reported [5]. Long-term sequelae are unknown, certainly in our patient after 1 year, pacing parameters has remained stable and clinically the patient remains well.

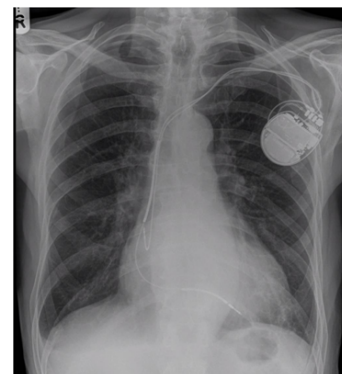


Figure 2: PA CxR at one month post initial procedure.

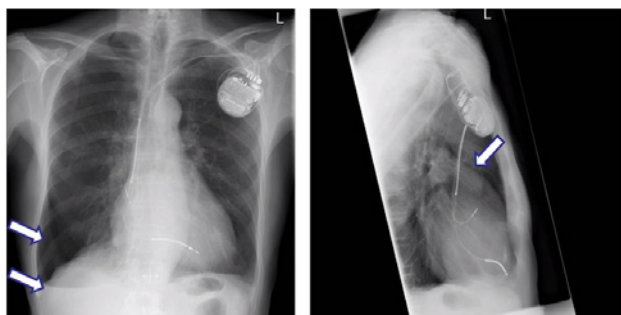


Figure 1: PA and Lateral CxR showing contralateral pneumothorax and haemopneumothorax, as well as pneumopericardium (best seen on the lateral film).

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Learning Points

Firstly, contralateral pneumothorax and/or haemopneumothorax can occur with the cephalic vein approach to pacing secondary to atrial screw-in lead perforation.

Secondly, careful inspection of the chest x-ray for pneumopericardium should be done when there is a pneumothorax present and look for right sided pneumothorax even when the cephalic vein is used for access.

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