Delayed right ventricular perforation with a pacemaker lead into subcutaneous tissues

Déplacement tardif d’une sonde de stimulation cardiaque ventriculaire droite dans les tissus sous-cutanés

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An 82-year-old woman underwent routine pacemaker implantation for paroxysmal atrioventricular block. The operator did not encounter any difficulties at the time of lead placement. At a predischarge check three days later, electrical signals and thresholds were excellent and similar to those at implant. The chest X-ray showed a good lead position in the right ventricular apex. During a routine one-month post-implant visit, the patient pointed out that she felt, two weeks after discharge, a violent left-thoracic pain. The pain started while the patient was lifting a heavy object and ended five days later. Pacing could not to be achieved and the electrograms were small. Fluoroscopy suggested perforation. There was no pericardial effusion on echocardiography. Ventricular perforation was confirmed by computed tomography scan (Fig. 1). The tip of the lead (5076 Medtronic Inc., Minneapolis, MN, USA) was found in the subcutaneous tissues. Because the subsequent attempt to remove the lead could induce an acute cardiac tamponade, the procedure was performed in an operating theatre with a suitable emergency backup, that is, immediate availability of echocardiography, equipment for pericardiocentesis and a thoracic surgeon on stand by.

The lead was pulled back into the ventricle and repositioned at the same time on the interventricular septum. At the end of the procedure, arterial pressure dropped and echocardiography revealed a moderate pericardial effusion with mild compression of the right ventricle. A subxiphoid incision was made. The surgeon evacuated a mild pericardial haematoma. No ventricular injury was found. A drain was positioned in the pericardial space for 48 h. The patient continued to recover well after the hospitalization.

Cardiac perforation by the implanted pacemaker lead occurs at a complication rate of 0.4—2.0%. If the perforation is diagnosed more than one month after implantation, it is described as delayed. The most common manifestations of delayed perforation may...
be haemopericardium, cardiac tamponade, pectoral muscle or diaphragm stimulation, and pneumothorax. Loss of stimulation properties can be the only sign indicating this complication. Diagnosis is habitually done by fluoroscopy and echocardiography. Computed tomography scanning is a sensitive tool for the diagnosis of cardiac perforation. The major risk factors for cardiac perforation are age, female sex, body mass index below 20, use of anticoagulants or steroids, and use of leads with an extendable fixation lead.

Several options are available to treat this complication. The first is to pull back the lead into the ventricle, performed in the operating theatre, with suitable preparation because the heart often ‘self-seals’ after perforation. The second is to refer the patient to the cardiac surgery department, to withdraw the lead under visual control, usually after sternotomy. An epicardial lead could be implanted during this procedure. Whichever option is chosen, surgical stand-by is necessary, as was the case in our patient. To prevent this complication, we recommend implanting the right ventricular lead in a septal position and advising the patient not to carry heavy objects or undertake vigorous tasks within the month after implantation (Fig. 1).

Figure 1. Computer tomography scanning is showing right ventricular perforation with a ventricular lead into subcutaneous tissues.