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Inadvertent implantation of conduction system pacing lead into left ventricle via patent foramen ovale in dual-chamber pacemaker

Short title: Inadvertent left ventricular stimulation

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A 52-year-old female with arterial hypertension, hypercholesterolemia, after dual pacemaker implantation with ‘left bundle branch pacing’ (in another provincial cardiac center) 6 months ago due to atrio-ventricular 1st degree with long PQ interval of >350 ms and paroxysmal atrio-ventricular 3rd degree block with history of recurrent syncope was admitted to our center with ST-elevation myocardial infarction of atherosclerotic background of anterior wall which was successfully treated with primary percutaneous cardiac intervention of anterior descending coronary artery with drug eluting stent implantation. Alarmingly, coronarography and the routine echocardiogram revealed a pacemaker lead (Medtronic 3830 SelectSecure MRI SureScan) tip in the left ventricle. Moreover, the electrocardiogram disclosed some features of

left ventricular pacing: right axis deviation, negative QRS complexes in I, aVL and V6 and right bundle branch block QRS pattern in lead V1 — unprecedented configuration for left bundle area pacing [1, 2]. Since the presence of an endocardial lead in the left atrium and ventricle poses a significantly increased risk of systemic thromboembolism related to the thrombogenicity of a foreign surface in the systemic circulation with the most dramatic presentation of ischemic stroke, the brain computed tomography scan with contrast was performed which showed no ischemic lesions. The decision was made to remove the lead as soon as possible [3]. After 6 days of anticoagulation with enoxaparin 1 mg per kg of body weight twice daily, along with dual antiplatelet therapy, following the transesophageal echocardiogram excluding thrombus in left ventricular chambers and attached to the lead, the lead was explanted using simple traction without any specialized tools (it was the fourth successful explantation of the lead this type and the first from the left ventricle in our center). A new one of the same type (Medtronic 3830 — 69 cm) *via* a dedicated delivery catheter (Medtronic C315HIS), from the right ventricular site with the tip in the interventricular septum, in the left bundle region was, during the same procedure implanted [2, 4]. There were no indications for foramen patent ovale closure [5]. The patient was discharged from hospital with dual antiplatelet therapy (acetylsalicylic acid 75 mg o.d. and ticagrelol 90 mg b.i.d). No adverse events within 3-month-follow-up were recorded.

Article information

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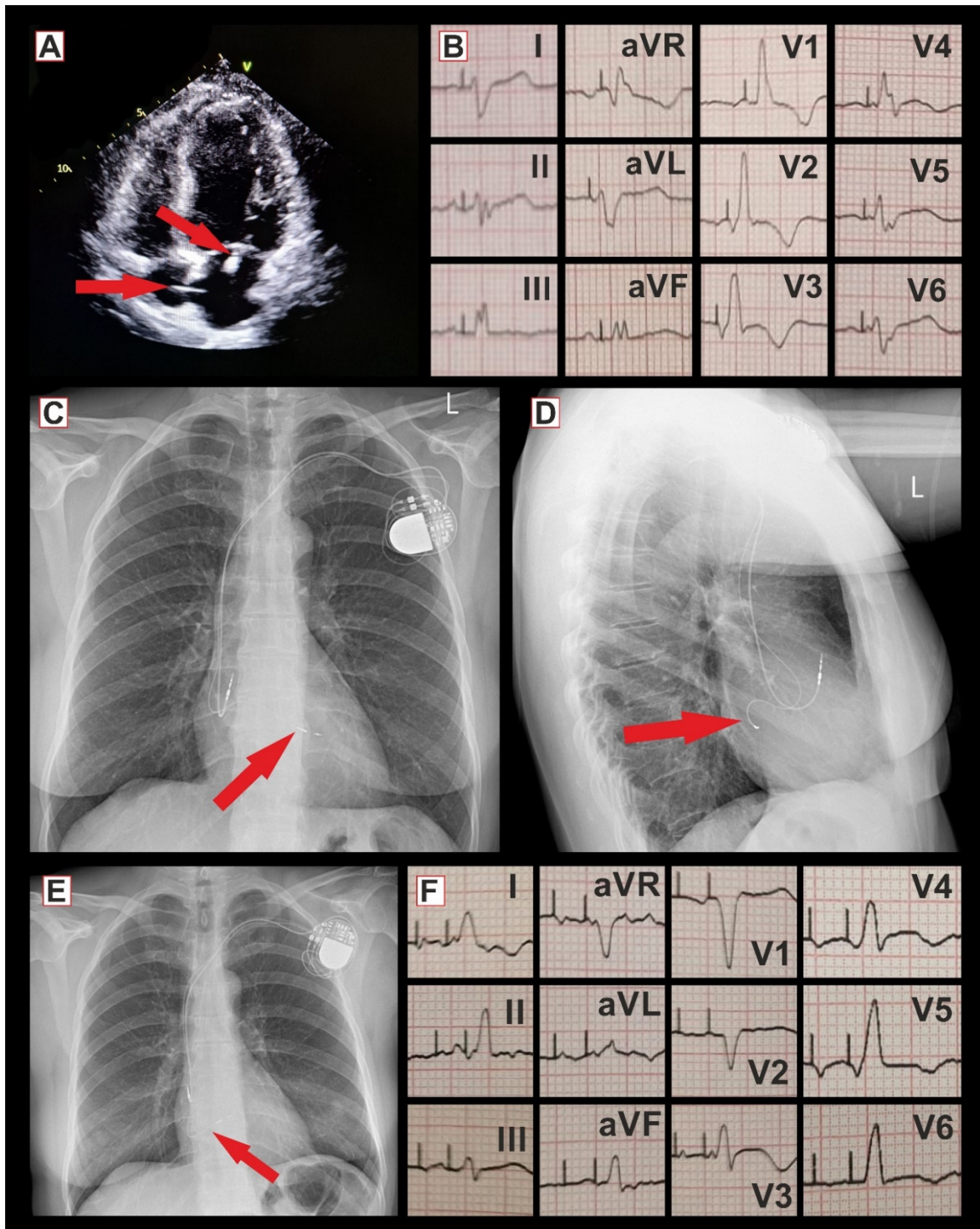


Figure 1. **A.** Transthoracic echogram. Ventricular lead of a pacemaker is crossing the interatrial septum via patent foramen ovale and subsequently a mitral valve with its tip in the basal part of the lateral wall of the left ventricle. **B.** An electrocardiogram with left ventricular stimulation. **C.** and **D.** Chest X-ray posterior-anterior and lateral projections displaying the course of the lead with its tip in the left ventricle. **E.** Chest X-ray posterior-anterior projection with a new ventricular lead with its tip in a left bundle-branch area of the interventricular septum. **F.** An electrocardiogram with direct left bundle branch stimulation