

EP CASE REPORT

Successful implantation of subcutaneous implantable cardioverter-defibrillator in a patient with severe pectus excavatum

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Arrhythmogenic right ventricular cardiomyopathy (ARVC) is a genetically determined progressive heart muscle disorder associated with a high incidence of sudden cardiac death. Implantable cardioverter-defibrillator (ICD) is a main treatment strategy for high-risk patients.¹ Subcutaneous implantable cardioverter-defibrillator (S-ICD) provides life-saving defibrillation therapy without the need for transvenous leads and related complications.² Pectus excavatum also known as sunken or funnel chest, is the most common congenital deformity of the sternum. It is more challenging to place the S-ICD lead close to the fascia of the sternum in a patient with inward displacement of the sternum.

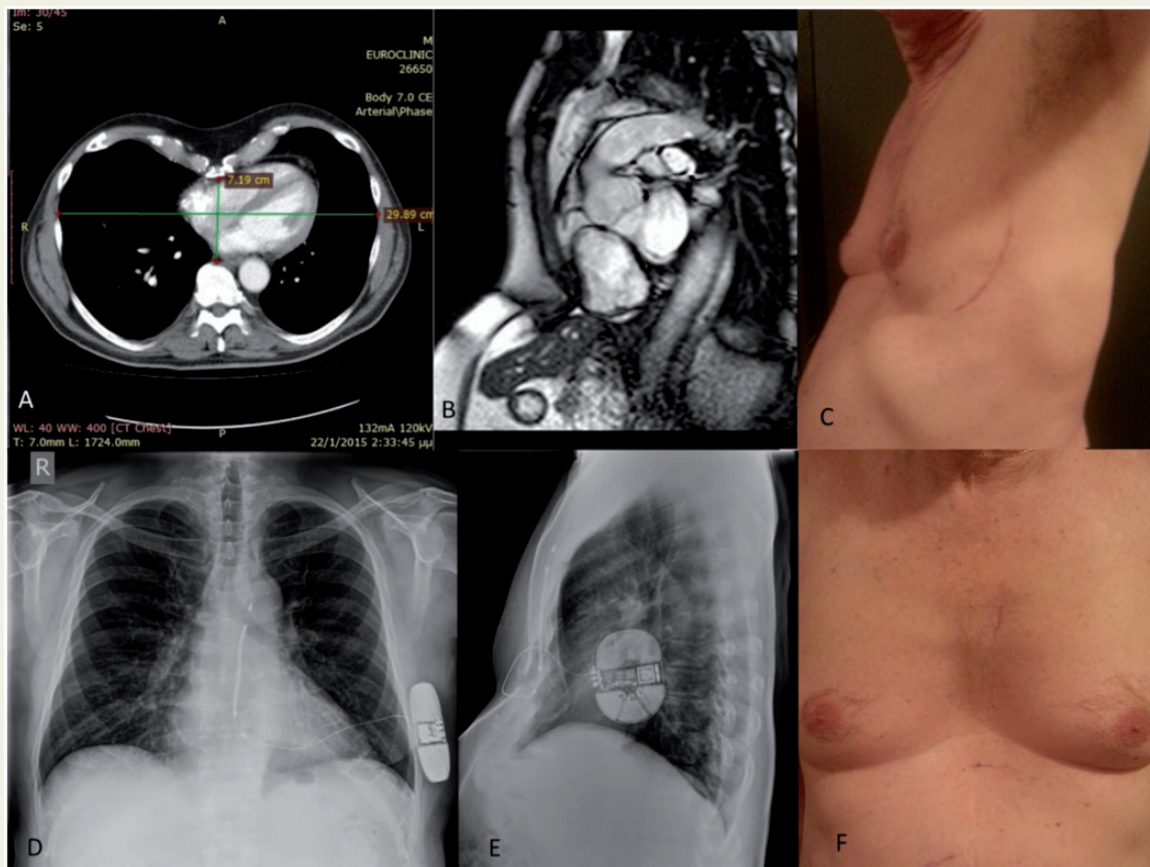


Figure 1 (A) Chest computed tomography was used to assess the severity of pectus excavatum (Haller index: 4.15). (B) Chest magnetic resonance imaging (lateral view). (C and F) Anterior and lateral view of patient's chest at 3 months follow-up. (D and E) Chest X-ray post implantation, anterior and lateral view, respectively. Note the close proximity of the lead to the sternum.

We report on a 60-year-old patient with ARVC and severe pectus excavatum who was considered appropriate for ICD implantation due to a history of unexplained syncope and non-sustained ventricular tachycardia. The patient had a history of splenectomy with multiple hospitalizations for sepsis due to ascending urinary tract infections attributed to *Escherichia coli*. Being concerned about possible transvenous lead infection and well-known difficulties in lead placement in ARVC patients, we opted for a S-ICD.

The Haller index (maximal transverse diameter/narrowest anteroposterior length of chest) was used to assess severity of incursion of the sternum into the mediastinum. Pectus excavatum was considered severe according to a Haller index value of 4.15 (Haller index > 3.5 indicates severe pectus excavatum).

We implanted a second generation S-ICD in an intermuscular pocket as previously described in Ref.³ (Figure 1). We used the traditional three-incision technique for the lead implantation, as the patient suffered from severe pectus excavatum.² The peel-away sheath required for the two-incision technique would most likely have kinked at the deepest point of the deformity of the sternum following removal of the lead insertion tool. Insufficient lumen would then have been available for lead insertion.

Ventricular fibrillation was induced and successfully terminated by a 65 J shock/68 Ohm impedance. Time from initial detection to shock delivery was approximately 11.5 s. Lead position was confirmed fluoroscopically and following an uneventful post-operative period, the patient was discharged at the following day post-implantation. At 3 months follow-up, the patient was asymptomatic, incision sites healing was considered uncomplicated and S-ICD interrogation revealed no arrhythmic event.

Conflict of interest: none declared.

References

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