CASE REPORT

Single-step transvenous extraction of a passive fixation lead with delayed perforation of the right ventricle

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Received 14 March 2007; accepted after revision 7 April 2007; online publish-ahead-of-print 16 May 2007

KEYWORDS
Pacemaker; Delayed lead perforation; Lead extraction

Case report

A 76-year-old female with repeated syncopal episodes was implanted with a permanent dual-chamber pacemaker with passive fixation leads, because of intermittent complete heart block. An endocardial electrogram was not recorded from the lead at the time of implantation. In the pre-discharge chest X-ray, 48 h after the intervention, the atrial and ventricular leads were in correct position.

Two months later, the patient complained of a recurrence of syncopal episodes. Interrogation of the pacemaker revealed failure of ventricular pacing and sensing, and a reintervention was scheduled. The procedure was performed in the electrophysiology (EP) lab, and fluoroscopy showed displacement of the ventricular lead (Model St. Jude Medical Isoflex S1646T), far advanced to an extracardiac position (Figure 1).

Gentle traction of the proximal end of the lead made it pull back into the right ventricle, and then it was easily explanted. The condition of the patient remained stable. A new passive fixation lead was implanted in a more proximal position. Less tension was applied this time. There were no complications, and the patient was admitted to the intensive care unit for close monitoring. Serial echocardiograms did not reveal a pericardial effusion. Pre-discharge chest X-ray demonstrated a correct placement of the leads.

After 4 months of follow-up, the patient is in good condition, with normal function of the new lead and without any complication of the procedure.

Discussion

Delayed lead perforation (defined in the literature as occurring >1 month after implantation) is believed to be a very rare complication. Clinical presentation varies widely: chest pain, pneumothorax, hemothorax, and cardiac tamponade. It is confirmed with imagiologic evaluation (chest X-ray, but most often chest computed tomography scan is necessary to delineate the path and locate tip position).

Our patient had passive fixation leads, but most of the published case reports involve active fixation leads. A possible predisposing factor, already described and that could apply...
to the case reported here, is excessive lead coiling, contributing to more tension against the free ventricular wall.

The best management of this situation is unclear, and different strategies could be found in the literature. One option is to implant a new lead without extracting the old one. However, if the lead has migrated out of the pericardium, there is a risk of vascular or pulmonary injury, and removal of the lead should be carried on.

The described approach generally depends on the lead type. Active fixation leads have been mostly extracted transvenously, after retraction of the coil. In the majority of cases reported, the lead could be extracted without serious complications or significant pericardial effusion.

Extraction of passive fixation leads, as was the case, causes concern that the bulky tip of the lead can damage tissues during removal, and few cases have been described. The usual approach has been a first step surgery to cut the distal tip, followed by transvenous removal of the body of the lead. Although it can be a potentially dangerous procedure, single-step transvenous extraction of a passive fixation lead that has undergone a delayed perforation, if done in the first months, can be performed uneventfully and easily, as was the case.

Conflict of interest: The authors have no associations (either commercial or industrial) that may pose a conflict of interest.