

Accidental Snapping of Right Ventricular Pacing Lead with MICRA

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Abstract

Leadless Pacemaker implantation rates are increasing worldwide. These pacemakers have to be deployed, captured and redeployed in order to achieve optimal electric parameters. Various complications occur during this procedure. We herein report a unique case, where right ventricular (RV) pacing lead of the patient was accidentally snapped with the tines during deployment of intracardiac pacemaker in an elderly male with pocket site infection.

Keywords: MICRA, Leadless pacemaker, Complications

1. Introduction

MICRA™ (Medtronic USA), transcatheter leadless pacing system (TPS) is implanted in right ventricle (RV) to provide rate-responsive single-chamber pacing. It received FDA approval in April 2016 [1]. Various complications during implantation have been documented including embolization, cardiac tamponade [2]. MICRA delivery system consists of delivery sheath, device, and a tether which maintains a connection between the two. Quite often MICRA has to be deployed, captured and redeployed in order to achieve optimal electric parameters and this occurs in about 40% cases [3].

2. Case

A 92 years old male who had undergone a dual chamber pacemaker insertion for complete heart block two months back presented with redness and discharge from the pocket site (Fig. 1).

The patient was taken up for MICRA TPS insertion in view of frailty and poor muscle mass in the pectoral region. After cannulating the right femoral vein loaded device was implanted at right

ventricular apex after ascertaining the position in right anterior oblique (RAO) 30 and left anterior oblique projection (LAO) 40. However, in view of suboptimal pacing parameters, it was decided to retrieve the device. Traction was applied to the tether and delivery sheath was slowly advanced towards the device. However, during this procedure, screwed RV pacing lead got entangled in one of the tines of MICRA TPS (Fig. 1). To make things worse, the distal end of the screwed RV pacing lead snapped and came out along with MICRA TPS (Fig. 1) into the delivery sheath. The patient went into ventricular asystole. CPR was started immediately, and temporary pacemaker lead was introduced from the left femoral vein; successfully pacing the RV and reviving the patient. It was decided to abandon the procedure and implant a regular dual chamber pacemaker from the right subclavian approach which was done the next day and the patient was discharged in a stable condition.

3. Discussion

Traditional transvenous pacemakers are associated with various short and long term complications. Complication rates have been documented to be as high as 12% and include pneumothorax, cardiac perforation, lead dislodgement, pocket infection,

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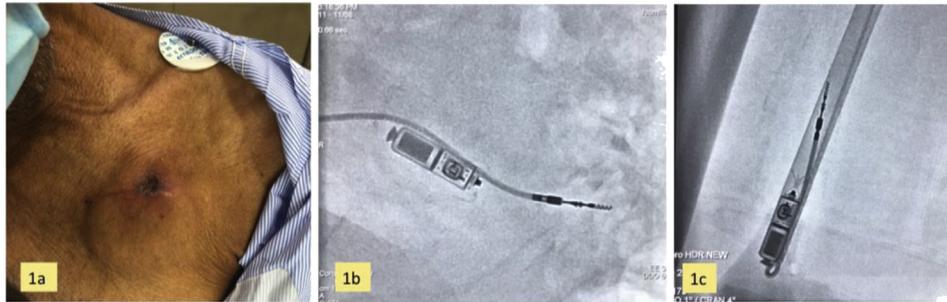


Fig. 1. a. Showing pocket site infection 1b. Screwed RV pacing lead entangled in one of tines of MICRA TPS 1c. Retrieved MICRA TPS device along with snapped distal RV pacing lead in MICRA introducer sheath.

tricuspid regurgitation, venous obstruction, lead fractures, insulation failure and infective endocarditis [4,5]. The primary advantage of a leadless pacemaker is elimination of these complications.

During transcatheter pacing system insertion, complications may occur related to femoral vein access or during device repositioning. There is moderate risk of cardiac perforation with subsequent pericardial effusion. Leadless trial [6] documented device-related complications to be 6.5%. Pericardial effusion occurred in 1.5%, vascular complications in 1.2%, there were 6 device dislodgements, 0.8% patients underwent late device retrieval for elevated pacing thresholds and worsening heart failure.

MICRA attaches to the right ventricle myocardium via four linear self-expanding nitinol tines. To achieve adequate fixation and electric parameters, MICRA has to be repositioned after deployment in about 40% of cases [3]. While recapturing the device, traction is applied to the tether, and delivery sheath is advanced slowly till recapture cone of the delivery sheath is in contact with the device. Tsz Kin et al. [7] have described snapping of a tether during deployment and embolization of MICRA to the inferior branch of the left pulmonary artery from where it was successfully snared. Our case report is first in contemporary literature to document accidental snapping of an RV pacing lead during retrieval of the device. The idea behind reporting this case is that even with careful deployment, all the tines may not be seen even in multiple views. And if the position of the implant is near the RV lead, one has to extra careful to avoid this kind of a complication. We reiterate the point that one has to be vigilant while retracting the device more so in patients who have a pacing RV lead in situ as there is an increased risk of lead entanglement.

Author contribution

Conception; Literature review; Methodology; Investigation; Writing- review & editing;

Visualization; Supervision; Project administration: Vivek Singh Guleria; Prafull Sharma. Software; Resources; Writer-original draft; Fundings: Prafull Sharma; Prashant Bharadwaj. Analysis and/or interpretation; Data collection and/or processing: Vivek Singh Guleria; Prashant Bharadwaj.

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Conflict of Interest

Author declared no conflict of interests.

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