Simultaneous infection of CIED and newly implanted leadless cardiac pacemaker

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Abstract

CIED infection is a serious complication and remains the commonest indication for TLE.The patient exist two problems: bilateral venous access infection and pacing dependence. LP provide safe and effective pacing options for patients with device-related infections.

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leadless cardiac pacemaker

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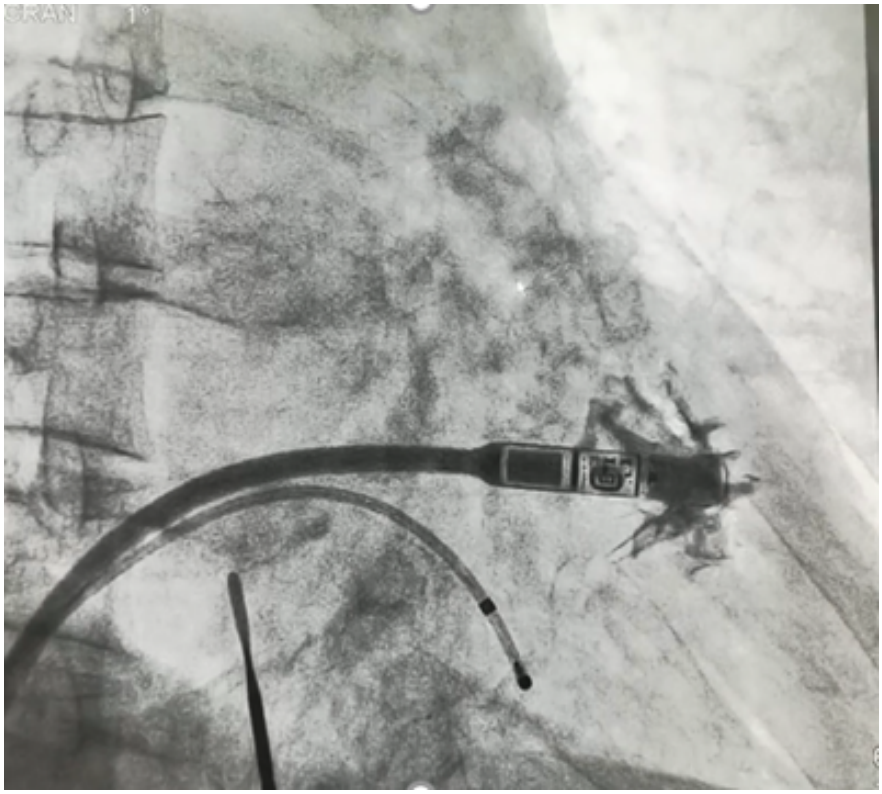
Abstract Cardiovascular implantable electronic devices (CIED) infection is a serious complication and remains the commonest indication for transvenous lead extraction (TLE). However, there are seriously challenges such as venous approach occlusion and reinfection after extraction.Leadless pacemaker (LP) provide safe and effective pacing options for patients with device-related infections.In this case, the patient solved two problems: infection and pacing dependence.

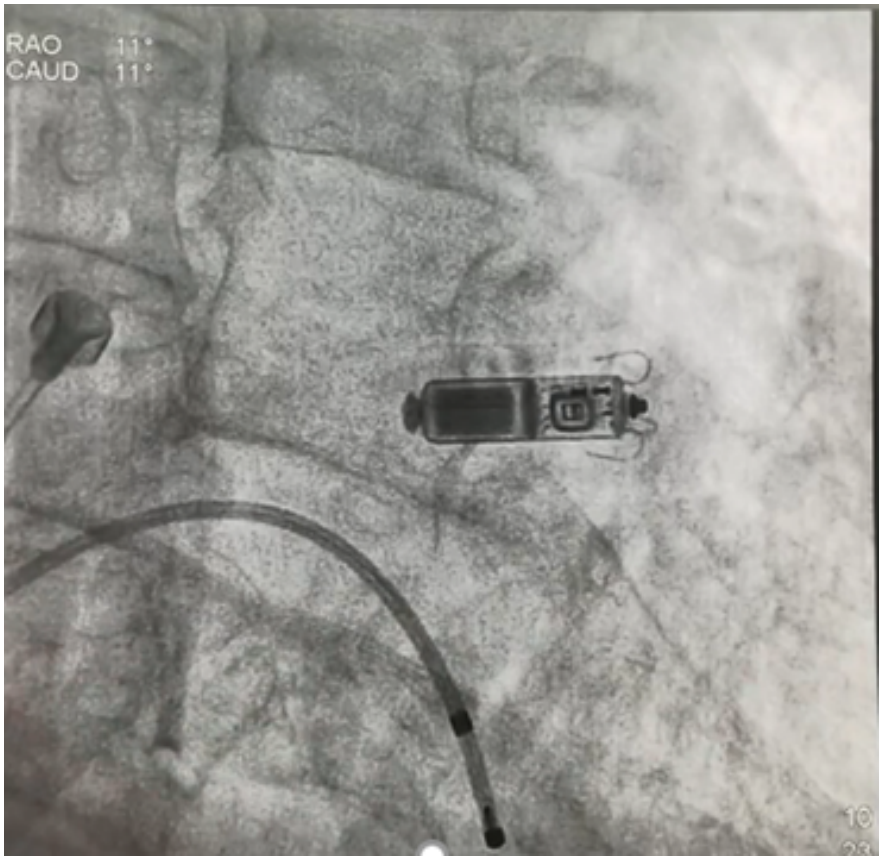
Keywords CIED infection; Pacing dependence;Leadless pacemaker

An 64-year-old man received a dual-chamber pacemaker for sick sinus syndrome and third degree atrioventricular block in May 2019, and the pacemaker was removed due to pacemaker pocket infection in March 2020. A dual-chamber pacemaker was implanted through the subclavian vein on the contralateral side 2 day after surgery. On August 20,2021, he developed pocket erosion, with streaks of pus exuding from the pocket,without fever. Blood cultures indicated Staphylococcus epidermidis , and pus cultures were negative, and Laboratory fifindings revealed a high C-reactive protein (CRP) level (10.0 mg/dL). He received vancomycin for seven days. The patient had removal of pacing system and reimplantation of pacemaker. After discussion, it is planned to perform the surgery for simultaneous TLE and implantation of LP.Blood culture results were confirmed negative at 72 h after the extraction. During nine months of observation,with no subsequent infection recurrence by echocardiographic and blood examinations .

The patient was placed in the supine position and a temporary endocardial pacemaker was implanted through the left femoral vein. The pacemaker pulse generator was removed after local anesthesia, and then the right atrial and right ventricular electrodes were removed through the right subclavian vein . The right femoral vein was then punctured, successively dilated and implanted with a sheath (outer diameter 27F) through which it was delivered to the leadless pacemaker delivery system. Through the right anterior oblique and

left anterior oblique positioning (avoid the original right ventricular lead implantation site), the leadless pacemaker was positioned in the right ventricular middle septum, the leadless pacemaker was released after satisfactory results were obtained from the electrical parameters test.The measured pacing parameters including ventricular threshold, ventricular sensing and impedance were 0.63v, 10mv and 1040 Ohm respectively. Remove the tether, remove the delivery system and sheath, and end the procedure (Fig.1).





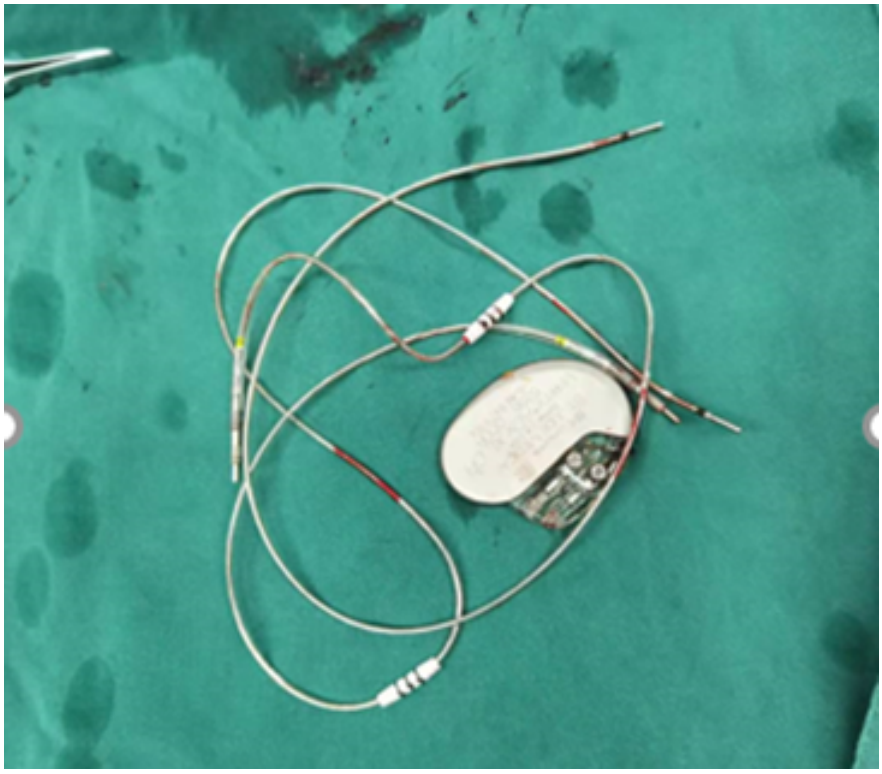


Fig1. A.Chest radiograph of the patient showed that the pacemaker was located on the right chest wall, with atrial and ventricular electrodes. B.Leadless Pacing Position (RAO30).C.Micr Leadless Pacemaker Successful Release .D.The pacemaker and electrodes were removed from the body.

Discussion

In recent years, with the development of pacing technology and the expansion of indications, the number of pacemaker implantations has been increasing. The incidence of related complications, especially pacemaker device infection is increasing [1]. Since the removal or extraction of CIED is usually mandated if infection occurs,prevention of infection is a key goal. For patients with pacemaker indications, a new pacemaker needs to be reimplanted, and this process has many risks, such as reinfection and venous approach[2]. The patient was already infected, and there was a significant risk of recurrent infection with a conventional pacemaker implanted via the traditional venous approach. LP is a new technology. LP integrate pulse generators and pacing leads, avoid pocket and lead-related complications, and can be an option for implantation after pacemaker device infection [3] .There are rarely cases that infection after conventional pacemaker implantation in the same patient , and fewer reports on extraction of the original device and simultaneous implantation of a LP. LP may provide new opportunities for the management of patients with pacemaker infection. In a study by Chang et al.[4] ,no recurrent infections were observed in 17 patients who received leadless pacemaker implantation and CIED extraction during the same procedure, where 4 patients had positive blood cultures at the time of implantation.Kypta et al.[5]reported that leadless pacemakers did not result in reinfection, even if implanted before removal of the infected pacemaker system during the same procedure . In a study by Li et al.[6],Despite a prior CIED infection and an elevated risk of recurrent infection, there was no evidence of CIED infection with a mean follow up of over 2 years following leadless pacemaker implantation at or after CIED system removal.Pacing lead extraction procedures can produce serious damage to the local myocardium [7].

In this case, the patient exist two problems: bilateral venous access infection and pacing depen-

dence.Therefore, LP is a optimal choice.Leadless pacemaker implantation reduces risks of device-related infections and complications following transvenous lead extraction.

Informed Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy

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Disclosure Statement

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