Clinical Case Reports

Management of a complicated 'pacemaker pocket' site infection

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ABSTRACT

Pocket site infection after implantation of a pacemaker is a dreaded complication which requires removing the device and reimplanting it at a contralateral site. Difficulties arise when the patient is dependent on pacing and when there are issues with venous access at the contralateral site. We report a patient with pacemaker pocket site infection with congenital complete heart block managed with explantation of the device, semi-permanent pacing during antibiotic treatment, reimplantation of the device at the contralateral site and management of subtotal subclavian vein stenosis noted during reimplantation.

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INTRODUCTION

Pocket site infection of a cardiovascular implantable electronic device (CIED) is treated by removal of the device. This is followed by complete treatment of the infection and reimplantation of the device in a new site. Management is complicated when the patient is dependent on pacing, requiring temporary pacing during the treatment of the infection and when there is difficulty in venous access at the new site.

THE CASE

A 16-year-old boy, known to have congenital complete heart block, presented with syncope in 2014 at a nearby hospital. A permanent pacemaker (VVI) was implanted through the right subclavian vein. The patient presented in June 2018, with complaints of syncope, was evaluated and found to have a lead fracture. An attempt at lead revision failed, the lead was abandoned on the right side, and a pacemaker (VVI) was placed through the left subclavian vein. He again presented in August 2018 to the same hospital with pain, swelling and pus discharge from the left-sided system pocket site. The patient was diagnosed to have a pacemaker pocket site infection and managed conservatively with antibiotics. In January 2019, the patient presented with recurrent symptoms of pain, swelling and pus discharge from the left-side pocket site. There was dehiscence of the pocket site. Initially he was managed with antibiotics, secondary suturing and referred to our hospital.

At presentation, the patient was afebrile with stable vital parameter. Localized pus discharge was seen at the incision site with sutures *in situ*. There was no erythema or induration. A trans-oesophageal echocardiography was done to exclude vegetations over the leads and valves. The chest X-ray showed the abandoned lead on the right side and the left-sided VVI system (Fig. 1). Investigations done showed no leucocytosis, with normal C-reactive protein and procalcitonin levels. The pus and blood cultures were sterile. The patient was diagnosed to have an isolated generator pocket infection. The left-sided generator and lead were explanted. As the patient was pacing-dependent, a semi-permanent pacing strategy was implemented to provide pacing support during treatment of the infection. A right internal jugular vein access was used to place a screw-in lead in the right ventricle, and it was connected to an external generator (Fig. 2). The patient was given intravenous antibiotics for 2 weeks and a new dual chamber pacemaker (DDD) was planned on the right side. At the time of venous puncture, subtotal right subclavian occlusion was present (Fig. 3). Initially, a Teflon wire was used to cross the stenosis but was not successful. A 0.0322 Terumo wire was used to negotiate the stenosis. Over the Terumo wire, dilator of 6F sheath was advanced. A balloon dilatation was not done as the stenosis was negotiated using the Terumo wire and dilator. This was followed by the introduction of a 6F peel-away sheath. A 6F lead was then advanced through the sheath, lead was screwed in and the DDD system placed. The previously abandoned lead was left *in situ* (Fig. 4). The patient received 2 weeks of antibiotics after the right-sided implant. Both sites healed well on follow-up. The abandoned lead is *in situ* and requires regular monitoring.

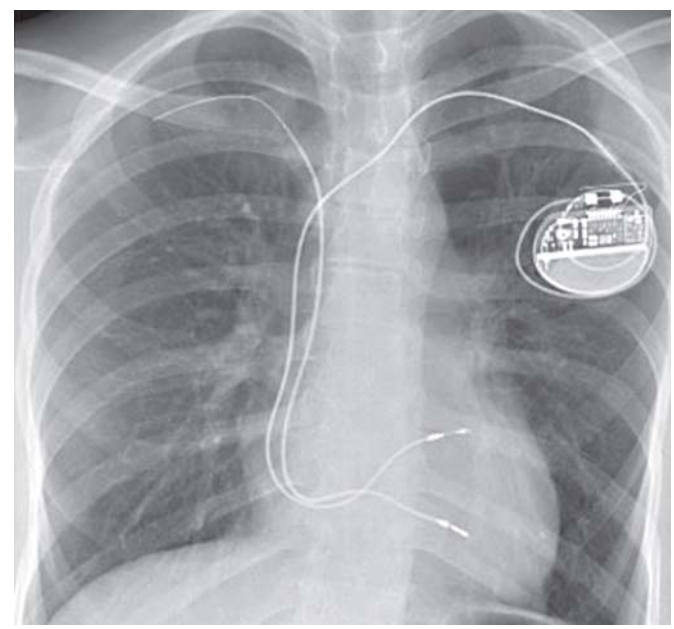

FIG 1. Chest X-ray showing abandoned lead on the right side and the left-sided VVI system

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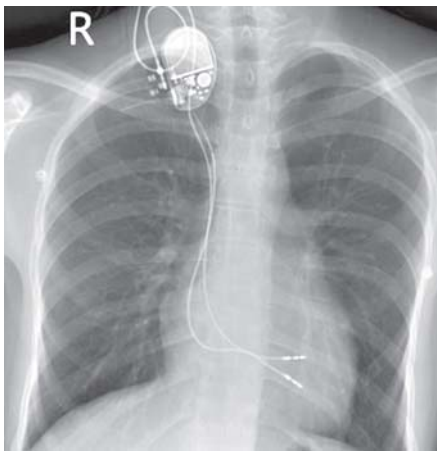

FIG 2. Semi-permanent pacing with right internal jugular vein access and screw-in lead in the right ventricle, with external pulse generator

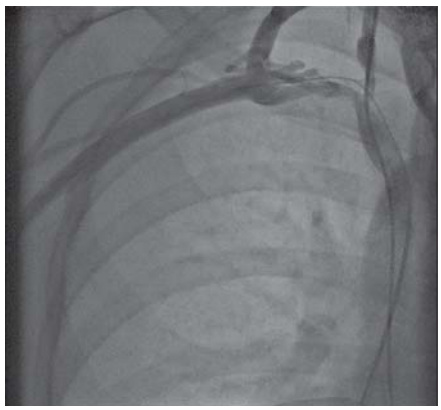

FIG 3. Venogram showing subtotal occlusion of the right subclavian vein

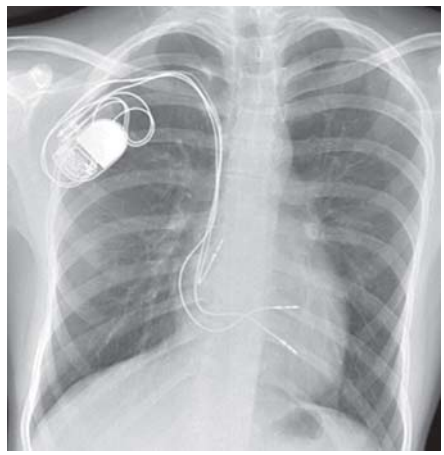

FIG 4. Right-sided dual chamber pacemaker with previously abandoned lead *in situ*

DISCUSSION

Pocket site infections occur at the rate of 4.82 per 1000 permanent pacemaker (PM)-years.[1] The reported admission mortality rates for all cardiovascular implantable electronic device (CIED) infections vary from 3.7% to 8.1%.[2] According to the 2017 Heart Rhythm Society expert consensus statement of CIED lead management and extraction, if there is a pocket infection, the CIED must be removed and antibiotics given for 2 weeks after removal. Reimplantation of the CIED can be done at a later date, depending on the clinical situation.[3]

With pacing-dependent patients, temporary pacing is required prior to reimplanting a new permanent device. The 'semi-permanent' pacing method includes using a screw-in pacing lead connected to an external pulse generator. This method ensures adequate pacing while the patient waits for re-implantation of a new device.[3]

New device implantation is usually recommended 72 hours to 14 days after explantation, depending on the clinical situation. If blood cultures are positive prior to explantation, the new device is delayed until the blood cultures are sterile for 72 hours. Reimplantation can be delayed further if there is a persisting clinically suspected source of infection. Reimplantation is done at a site contralateral to the initial device.[3]

Subclavian vein stenosis after pacemaker/implantable defibrillator has been reported with a variable incidence in the literature. Most studies have noted that a moderate degree of subclavian vein stenosis (>50% narrowing) occurs in 50% of patients. Even severe stenosis (>70%) can also be asymptomatic due to the development of venous collaterals. Difficulties arise when there is a need for lead revision. Most subtotal stenosis can be negotiated with a stiff guidewire. In more severe symptomatic cases, there may be a need for percutaneous venoplasty (with or without stenting) or surgical bypass.[4]

Conclusion

We have outlined the management of pacemaker pocket site infection in a patient who was dependent on pacing. We managed the subtotal subclavian vein stenosis that can be encountered at the contralateral site, especially in a subset of patients who had a previous intervention at the contralateral site. The operator should expect and be prepared for these complications.

Conflicts of interest. None declared

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