Supraspinatus pocket: An alternative pacemaker location for patients with no prepectoral access

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Introduction

Pacemaker implantation in the standard subclavicular position can be challenging in patients with skin or muscular damages due to history of cancer of the upper aerodigestive tract or chest and/or radiotherapy. Here we report an original technique for pacemaker implantation that could be a good alternative for these patients.

Case report

We report the case of a 55-year-old man with a history of oral cancer treated by surgery and radiotherapy who presented with recurrent syncope due to sinus node dysfunction and complete atrioventricular (AV) block after extensive neck and face reconstructive surgery. Surgeons had previously removed all pectoral muscles for facial reconstruction. During this reconstructive surgery, the patient experienced cardiac asystoles due to carotid sinus hypersensitivity secondary to vagus nerve injury. After the surgery, repeated 15- to 30-second episodes of asystole due to sinus dysfunction and complete AV block occurred in the intensive care unit, requiring permanent pacing. However, because of the removal of all pectoral muscles and skin damage secondary to recent surgery and previous radiation therapy, the implantation of the generator in the standard subclavicular position was not possible. We thus decided to implant a single-chamber pacemaker in a right supraspinatus subcutaneous pocket. The patient was positioned in left decubitus to allow access to the right supraspinatus muscle, and a single ventricular lead was introduced through the right internal jugular vein (details in Supplementary Figure 1). We then performed a subcutaneous tunneling of the lead between the jugular access and the supraspinatus pocket and connected the ventricular lead to a KORA SR 100 generator (Sorin Group) (Figure 1). The can was inserted in the subcutaneous pocket and fixed to the muscle. Six months later, the patient did not feel any pain, the scar was clean, and the position of the can caused no discomfort (Figure 2). The pacemaker operated normally with 15% of pacing in the VVI 60/min mode, and the patient experienced no further syncope. He was advised to restrict his right-arm movements during the month following implantation. The patient subsequently recovered complete mobility of his arm and followed usual advice for standard pacemakers.

Discussion

In some patients, pacemaker implantation faces technical challenges due to the lack of vascular access or local skin or muscular damage caused by previous radiation therapy, surgery, or infections. In these cases, alternative techniques have been reported. The permanent transfemoral approach with quadricipital pocket has been proposed in patients with no venous access in the upper thoracic area or with local skin problems but this technique could be associated with a higher risk of infections. Transaxillary retropectoral pacemaker implantation has been proposed for underweight patients, in cases of local skin problems, or for aesthetic purposes, but this approach was not possible in the present case, because of the complete removal of pectoral muscles and extensive skin damage in this area. In patients with no upper thoracic venous access or with major skin damage, epicardial pacing...
could be considered. However, compared with endocardial pacing, epicardial pacing gets higher pacing threshold, is associated with greater surgical risk, and requires general anesthesia. Furthermore, previous radiation therapy, which our patient underwent, increases the risk associated with this procedure. Leadless pacing with femoral access would have been an excellent alternative in that setting. In the Leadless trial, indications for leadless pacemakers included permanent atrial fibrillation with AV block, normal sinus rhythm with second- or third-degree AV block with a low level of physical activity or short expected life span, or sinus bradycardia with infrequent pauses or unexplained syncope with electrophysiology findings (eg, prolonged HV interval). No prepectoral access secondary to surgery or radiotherapy or no superior venous access could each be a new indication for leadless pacing. However, the leadless-pacing technique is not yet available worldwide.

In the present case, we demonstrated that a technique using a supraspinatus location with internal jugular vein approach is a feasible one for pacemaker implantation. Jugular access was widely used in the first years of endocardial pacemaker implantation and was not associated with a higher risk of pneumothorax or venous thrombosis. However, as with other transvenous devices, there is a risk of jugular vein stenosis or occlusion that could occur as a long-term complication and would need curative anticoagulant therapy. The subcutaneous tunneling of the pacing lead from the jugular area to the supraspinatus pocket appears safe, as no major vessel is present in this area. This technique can be performed under local anesthesia or brief sedation and analgesia. Although we decided to implant a single-lead pacemaker in this case, dual-chamber pacemaker implantation would have been possible with this technique.

In conclusion, we report a new and simple technique for pacemaker implantation that could be an interesting alternative in patients with no standard prepectoral access.

Figure 2 Right posterolateral and anterolateral views of the patient showing the supraspinatus location of the can (white box). Skin and pectoral damage secondary to oral cancer and reconstructive surgery are visible in the anterolateral view (right, white arrow).
Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.hrcr.2015.11.005.

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