Early Experiences with Leadless Pacemakers: Venous Closure Strategies

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Introduction: Leadless pacemakers had been reported having many advantages over conventional single lead VVI pacemakers, as the risk of lead, pocket and subclavian venous puncture site related complications could be alleviated. Furthermore, leadless pacemakers design translates to fewer medical complications and fewer post-implant activity restrictions. However, leadless pacemaker using transcatheter venous puncture and higher size of transcutaneous catheters and sheath may cause another problem. El-Chami et al has reported 0.61% of events at the groin puncture site.

Methods: We compare two elderly patients case with two difference approach of venous closure strategies.

Result: Case 1, a 85-yr female presenting with symptomatic transient high degree AV block, was decided to have a leadless pacemaker. The procedure was uneventful and the vascular closure using figure-of-eight suture and wound closure sterile pad. The patient was discharged the next day, and came back to outpatient clinic after one week. The wound was dry and healed, but the skin was still open, and mild hematoma was observed. The skin eventually back to normal in one-month visit. Case 2, a 73-yr male presenting with symptomatic paroxysmal brady-arrhythmia and atrial fibrillation, was decided to have a leadless pacemaker. The procedure was uneventful and the vascular closure using two unit suture-mediated closure system, instead of figure-of-eight suture. The patient was discharged the next day, and came back to outpatient clinic after one week. And the wound and the skin was nicely back to normal, without any hematoma.

Conclusion: The leadless pacemakers need to be inserted percutaneously using higher caliber sheath (27Fr), mostly via transfemoral. After procedure and the sheath need to withdraw from the femoral vein, it leaves a big hole in the vein. This may lead to higher vascular complications compared to other diagnostic procedures using the 6 to 7 Fr sheath. Predictor of vascular access complications are older age, female gender, diabetes, small body surface area, sheath size, emergency procedure, intensity of anticoagulation and platelet inhibition, and comorbidities. Vascular closure device post transcatheter procedures has been approved by FDA to use for femoral artery and vein closure strategy, yet the cost-efficient aspect need to be considered. Vascular closure strategy need to be applied in personalized way, considering the risk profile of the patients and the cases. In the patients with low risk for vascular access complications, figure-of-eight suture would be sufficient. In contrary, for the patients with high risk for vascular complications, vascular closure device using suture-mediated closure system would be the choice.