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Commentary: Thoracoscopic epicardial permanent pacemaker lead placement: An alternative not a substitute

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CENTRAL MESSAGE

Thoracoscopic placement of epicardial permanent pacemaker leads represents an alternative to traditional surgical options. The challenges are mostly related to previous median sternotomy.

Transvenous placement of permanent pacemaker leads has been established as a reliable and less invasive approach for permanent pacing. However, this technique might not be suitable or possible for every patient. Those with systemic venous anomalies, functional single ventricle, and small infants/children are better served with epicardial systems.

Several approaches have been described for placement of epicardial pacing leads (EPLs). Thoracotomy (right/left, anterior/lateral), subcostal,[1] and subxiphoid[2] approaches are common examples that have been tailored based on patient body habitus and anatomy and the leads required. The concerns associated with the epicardial system include a higher incidence of lead failure and less durability compared with the endocardial system.[3] It represents a challenge when placement is required for those who underwent previous sternotomy, in whom difficulty often arises from trying to identify the optimal epicardial location to place the lead and when navigating through the epicardial scars. In fact, it is not uncommon to go through several attempts of securing the lead, testing, and then relocating it to confirm a good impedance and threshold. Sometimes "screw-in" leads are used, although these are less preferred compared with the "steroid-eluting" leads in some of these challenging scenarios.

Nellis and colleagues[4] described the use of video-assisted thoracoscopy (VATS) for placing "sew-on" EPLs in 5 children. The procedure was feasible in 4 patients and was converted to a mini-thoracotomy in 1 patient with hypoplastic left heart syndrome due to dense adhesions. The authors used the commercially available RAM device to place the leads, which were further secured using Cor-Knot titanium fastening devices.

The use of VATS to place EPLs has been described previously.[5] However, it is worth discussing the following points:

1. The applicability of this technique in congenital patients with multiple previous sternotomies remains to be determined. This is not only due to the dense mediastinal adhesions that are not infrequently encountered (one patient in the current series), but also because the procedure assumes that the optimal sites of the EPLs are identified from the first encounter. Securing the lead with the Cor-Knot device and realizing that the threshold/impedance is not satisfactory (high in the current series) will require relocating the lead to a different spot, which might not be easily achievable with the current technique of lead securement.
2. Patients with functional single ventricle may represent a challenge to this approach. The adhesions from previous sternotomies and the need for isolated lung ventilation for VATS may add unnecessary risk in these patients with suboptimal hemodynamics.

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3. The provided length of stay seems to be longer than would be expected for a minimally invasive approach.
4. What is the optimal type of suture to use for the atrial/ventricular leads? These sutures need be compatible with the Cor-Knot device as well and less problematic when placed through the thin atrial wall/fragile myocardium.
5. Like any other approach, patient selection is key, and identifying the right patient for VATS placement of EPLs is critical to its success.

Finally, I congratulate the authors on their approach, which seems to be a good option for the right patients. Nonetheless, I believe it will be important to compare the outcomes of the current approach with other techniques available for EPL placement to determine the feasibility, effectiveness, and practicality of such approach.

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