LETTERS TO THE EDITOR

To the Editor— Strategy for revision of subcutaneous implantable cardioverter-defibrillator following inappropriate shock

Do and colleagues[1] reported revision of a subcutaneous implantable cardioverter-defibrillator (S-ICD) in an adult with congenital heart disease. Right-sided, substernal electrode placement was selected,[2] previously addressing high defibrillation requirements.[3]

Our practice excludes patients from S-ICD implantation without 2 appropriate sensing vectors. The radiograph presented does not indicate optimal positioning for either sensing or shocking. A more dorsal and caudal position of the pulse generator, intermuscularly between serratus anterior and latisimus dorsi,[4] is less invasive and provides a secure pulse generator position with good cosmesis. A right parasternal subcutaneous placement would be sufficient for both sensing and defibrillation.[5]

Recent publications[6–8] with substernal electrodes have shown that caution is required with the surgical technique. It must be remembered that if an infection occurs with such a procedure, a life-threatening mediastinitis may ensue.

Substernal placement of electrodes for implantable defibrillation is high risk, especially after a median sternotomy. The distal tip of the electrode was manipulated through an intercostal space for fixation and was in an unusual, flexed position. The authors should have taken their own advice and attempted the least invasive methods in the first instance, rather than commencing with the most invasive and least tried method.

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Dr Winter is a paid consultant to Boston Scientific Corporation. Dr O'Connor is a former employee of Cameron Health Inc and Boston Scientific Corporation.

Reply to the Editor— Strategy for revision of subcutaneous implantable cardioverter-defibrillator following inappropriate shock

In response to the commentary by Drs Winter and O'Connor, we respectfully acknowledge their concerns but would disagree with their conclusions for this particular patient for the following reasons:

(1) The initial decision to place a subcutaneous implantable cardioverter-defibrillator was related to both his risk for sudden death and an inability to place a transvenous device, given the lack of venous access superiorly. An inferior caval approach was considered, but we felt that this was of greater risk long-term. The patient initially passed screening and his problems with low-amplitude sensing were intermittent in nature, partially triggered by the autogain algorithm after sensing premature ventricular contractions.
(2) We agree that placement of a right parasternal lead might have provided a solution, but repeat screening in a right parasternal location was not different from the left location. The computed tomography scan revealed only a marginal increase in myocardium across the sensing vector, thus prompting our substernal approach.
(3) The generator was already in a submuscular position, and because of the patient's overall size and small anterior-posterior diameter, a more dorsal position would have resulted in patient discomfort. As the concern was regarding sensing and not defibrillation, we felt that positioning the can more caudally would not have provided a benefit.
(4) The shock coil position provided adequate defibrillation safety margin despite the flexed appearance, and the electrode position resulted in the improved sensing.

We wholeheartedly agree that care should be taken with this technique. The procedure was performed by a cardiothoracic surgeon in the cardiac operating room. It is our opinion that this approach is feasible but not without risk and should not be considered unless other options are exhausted. It is also our opinion that epicardial implantable cardioverter-defibrillator systems with patch electrodes have a greater procedural risk.

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https://doi.org/10.1016/j.hrcr.2019.07.013