Intermuscular technique for implantation of the subcutaneous implantable defibrillator: a propensity-matched case-control study


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Background: A previous randomized study (PRAETORIAN) demonstrated that the subcutaneous implantable cardioverter–defibrillator (S-ICD) was noninferior to transvenous ICD with respect to device-related complications and inappropriate shocks. However, that was performed prior to the widespread adoption of pulse generator implantation in the intermuscular (IM) space instead of the traditional subcutaneous (SC) pocket.

Purpose: To compare survival from device-related complications and inappropriate shocks between patients who underwent S-ICD implantation with the generator positioned in an IM position in comparison with a SC pocket.

Methods: We analyzed 1577 consecutive patients who had undergone S-ICD implantation from 2013 to 2021 and were followed up until December 2021. SC patients were propensity-matched with patients of the IM group, and their outcomes were compared.

Results: SC implantations were performed in 367 (23%) patients. These patients were propensity-matched with 367 IM patients. Intra-procedural complications were reported in 9 (2.5%) patients in the SC Group and 7 (1.9%) in the IM Group. During a median follow-up of 29 months, device-related complications were reported in 55 (7.5%) patients and inappropriate shocks were reported in 54 (7.4%) patients. The risk of the composite primary endpoint was lower in the matched IM Group than in the SC Group (unadjusted hazard ratio 0.67, 95% CI 0.45–0.99, p=0.042), while the risk of appropriate shocks was similar between groups (unadjusted hazard ratio 0.99, 95% CI 0.60–1.64, p=0.976). There was no significant interaction between generator positioning and variables such as gender, age, body mass index, ejection fraction and generation of the device.

Conclusions: In this experience, IM S-ICD generator positioning was superior to SC positioning in reducing device-related complications and inappropriate shocks.