

INCIDENCE OF HIGH DEFIBRILLATION THRESHOLDS AND EFFICACY OF SUBCUTANEOUS ARRAY INSERTION DURING IMPLANTABLE CARDIOVERTER DEFIBRILLATOR IMPLANTATION

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Background: The incidence, risk factors, and management of very high defibrillation thresholds (DFTs) during implantable cardioverter defibrillator (ICD) testing are not well known. The purpose of this study was to assess (1) the incidence of very high DFTs and (2) the efficacy/safety of routinely adding a subcutaneous (SQ) array (Medtronic 6996SQ) for these patients.

Methods: Patients with DFTs greater than a 10-J safety margin from maximum output were considered to have very high readings and underwent SQ array insertion. These patients were compared with the rest of the patients who had acceptable DFTs.

Results: A total of 616 patients underwent ICD implantation during the analysis period. Of those, 16 (2.6%) had very high DFTs. By univariate analysis, younger age, non-ischemic cardiomyopathy, and secondary prevention indication were all significant predictors of very high DFTs ($p < 0.05$). In all 16 cases, other methods to lower DFT prior to array insertion were attempted but failed for all patients: reversing shock polarity ($n=15$), removing the superior vena cava coil ($n=14$), reprogramming shock waveform ($n=9$), and repositioning right ventricular lead ($n=9$). Addition of the SQ array successfully decreased DFT to within safety margin for all patients (32 ± 2 versus 21 ± 3 J; $p < 0.001$). Follow-up (mean 15.8 ± 21 months) was available for all patients, there were only 2 cases with inappropriate shocks due to atrial fibrillation. Complication due to SQ array occurred in none of the patients.

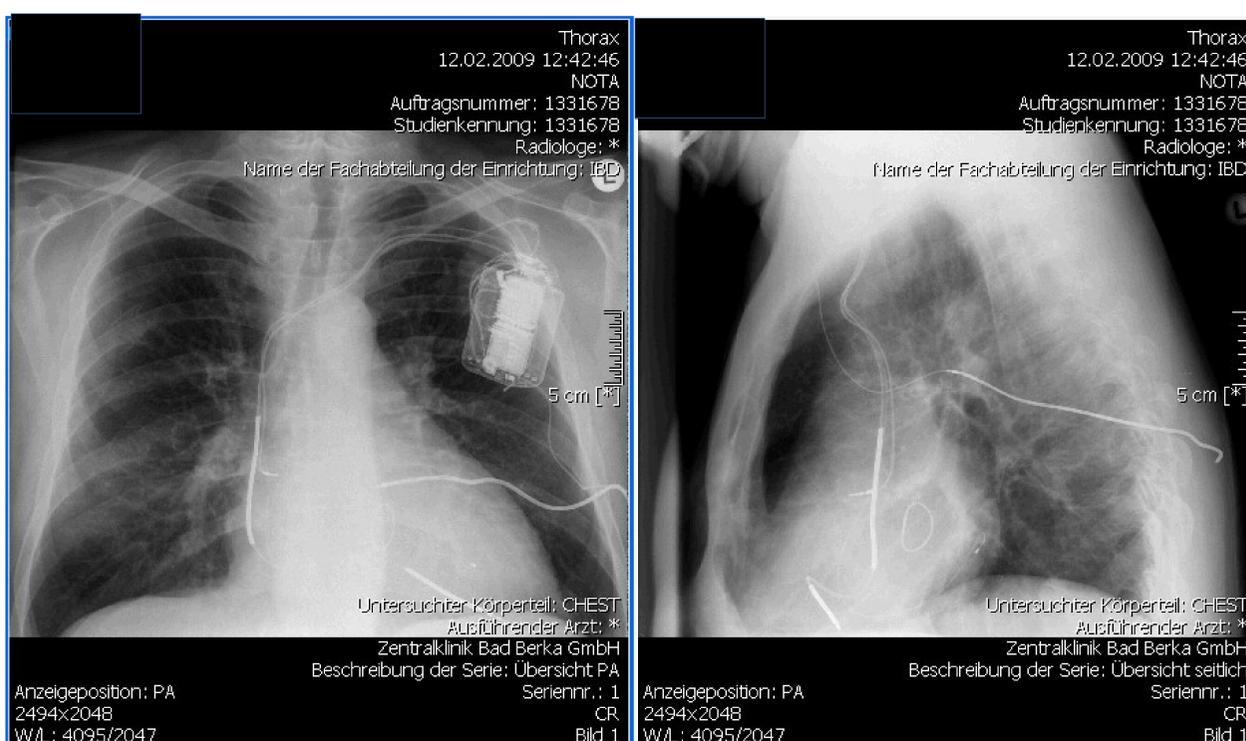


Figure 1: chest x-ray demonstrating subcutaneous array placement

Conclusion: Very high DFTs occur in about 2.6% of patients undergoing ICD implantation. SQ array insertion corrects this problem without procedural/mid-term complications.