PLACE 2026
PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

CONGRESSO
ROMA, 25 - 27 Giugno 2026

Comunicazioni orali – Sessione A
ELETTROFISIOLOGIA E DISPOSITIVI

Undersensing-Oversensing:
Subcutaneous ICD Double Trap in Desmoplakin Cardiomyopathy with extensive fibrosis

Cesarano E[1], Meynet P[2], Todesco LC[2], Cavallone E[2], Boccia L[2], Laiso E.L[2], Angelini F[3], Casula M[4], Ballatore A[2], Giustetto G[2], Bocchino PP[3], Gallone G[2], Raineri C[3], Saglietto A[3], Matta M[3], Castagno D[2], Ferraris F[3], Anselmino M[2], De Ferrari GM[2], Dusi V[2]

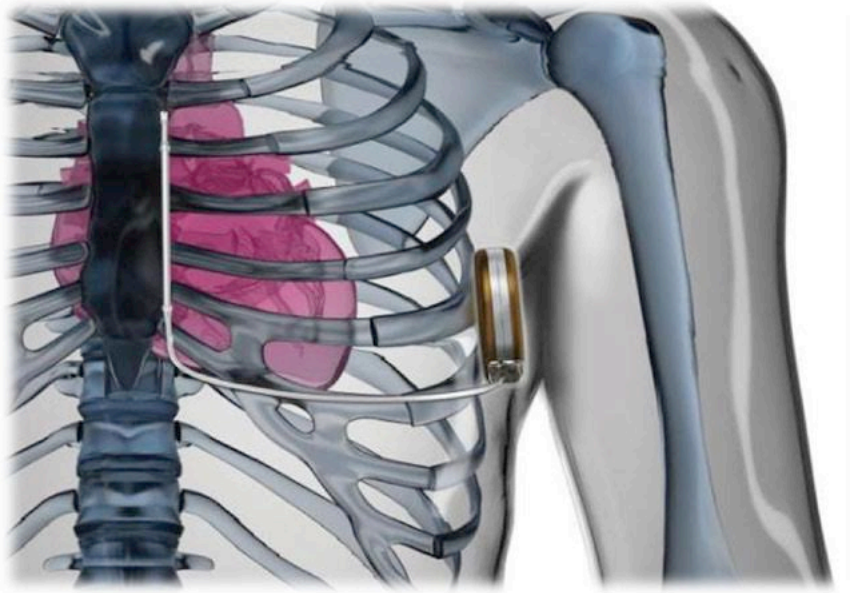
1. Cardiologia, Università degli Studi di Cagliari
2. Cardiologia, Dipartimento di Scienze Mediche, Università di Torino
3. Dipartimento Cardiovascolare e Toracico, Città della Salute e della Scienza, Torino
4. S.C. Cardiologia e UTIC, ARNAS "G. Brotzu", Cagliari

Dott. Lorenzo Candido Todesco

The **subcutaneous cardioverter-defibrillator** (S-ICD):

- offers **reduced complications** vs transvenous system;
- relies on **adequate surface signal voltages**

→ susceptible to **undersensing** in cardiomyopathies with extensive scarring.



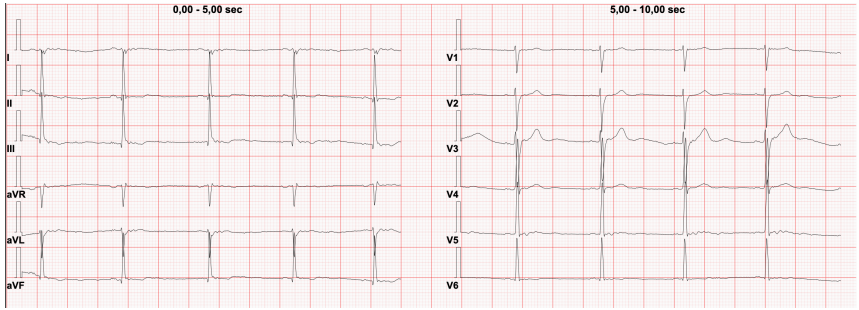
S-ICD

Undersensing-Oversensing: Subcutaneous ICD Double Trap in Desmoplakin Cardiomyopathy with extensive fibrosis

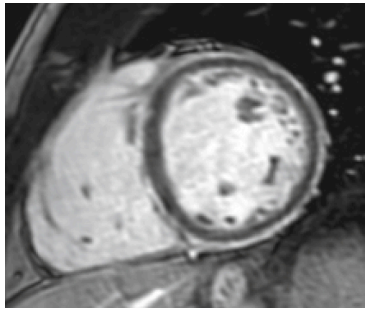
Situation: paradoxical oversensing due to noise, triggered by undersensing, via adaptive sensitivity in a third-generation S-ICD.

Background:

- 33-year-old man; FH of DSP-CMP (dad).
- **Desmoplakin-related arrhythmogenic left ventricular cardiomyopathy** (p.Gln1297* variant) with **extensive ring-like scar**.
- Frequent ventricular premature complexes.
- Treated with nadolol 1 mg/kg/die, empagliflozin and canrenone.



ECG at baseline



Ring-like LE at CMRI

Undersensing-Oversensing: Subcutaneous ICD Double Trap in Desmoplakin Cardiomyopathy with extensive fibrosis

Background:

05/2025: **implantation of S-ICD (2 vectors +)**

→ secondary vector tested and programmed as permanent (QRS amplitude at implant: 1.8 mV)

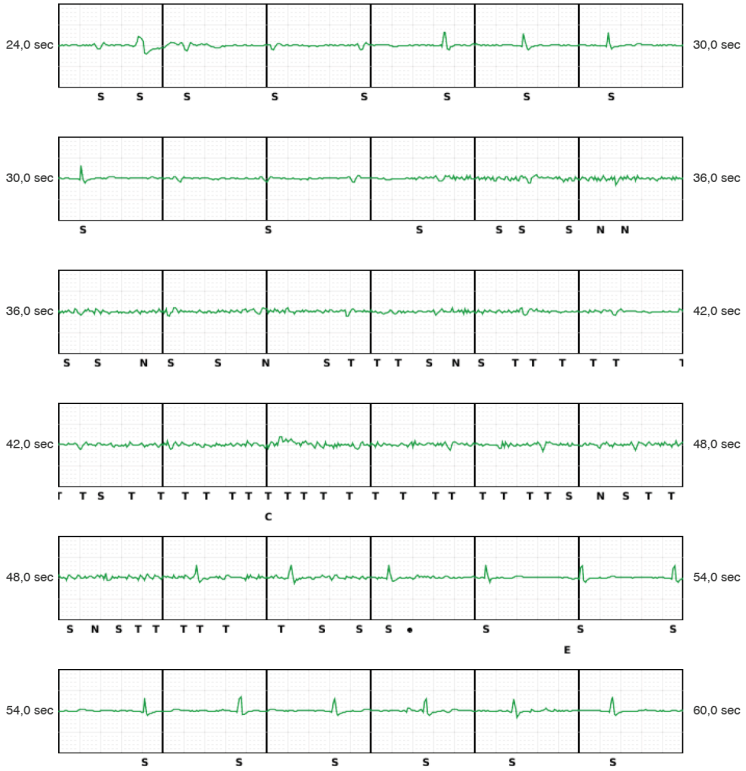
Impostazione guadagno	1X
Configurazione di sensing	Secondario
SMART Pass	ON

S-ECG programmation at implantation

09/2025: appropriate S-ICD shock for syncopal pleomorphic VT at 260 bpm.

Undersensing-Oversensing: Subcutaneous ICD Double Trap in Desmoplakin Cardiomyopathy with extensive fibrosis

Assessment: 10/2025, remote monitoring detected an **untreated episode**.



Impostazioni terapia Tachy	
Terapia	**ON**
Intervallo di erogazione shock	**240 min^{-1}**
Intervallo di erogazione condizionata shock	**170 min^{-1}**
Ulteriori impostazioni dispositivo	
Post shock pacing	ON
Impostazione guadagno	1X
Configurazione di sensing	Secondario
SMART Pass	ON

S-ECG visualizzato a 25 mm/sec 2,5 mm/mV

S = Sensing
P = Pacing
N = Disturbo
T = Rilevazione Tachy
C = Inizio carica
E = Fine carica
• = Scartato
♥ = Fine evento

S-ECG and programmation during the «untreated episode»

- Transient QRS amplitude reduction during sinus rhythm (from 1.8 to 0.8–1 mV).
- Adaptive sensitivity adjustments and noise oversensing.
- Capacitor charging.
- Self-termination of capacitor charging after 9 seconds when the QRS amplitude recovered.

Undersensing-Oversensing: Subcutaneous ICD Double Trap in Desmoplakin Cardiomyopathy with extensive fibrosis

Assessment: 10/2025, remote monitoring detected an **untreated episode**.

How to solve it?

- Reprogramming to the primary vector with 2× amplification (residual 10–15% amplitude variability due to posture).
- SMART pass properly automatically disabled.

S-ECG and reprogrammation after the «untreated episode»

The patient later experienced correctly detected and treated monomorphic VT at 270 bpm, prompting bilateral cardiac sympathetic denervation.

Recommendation:

This case illustrates a **potential S-ICD limitation in arrhythmogenic cardiomyopathy patients with extensive myocardial fibrosis**.

Reduced and dynamically variable QRS amplitudes can lead to both undersensing and oversensing via adaptive sensitivity algorithms, influencing the device's risk/benefit assessment and programming strategies.

When and who should always be the main questions to be answered.

THANK YOU
FOR YOUR ATTENTION!