

## Images in Cardiovascular Disease



# More Is Not Always More: A Timely Reminder Why Not to Use Too Much Hardware

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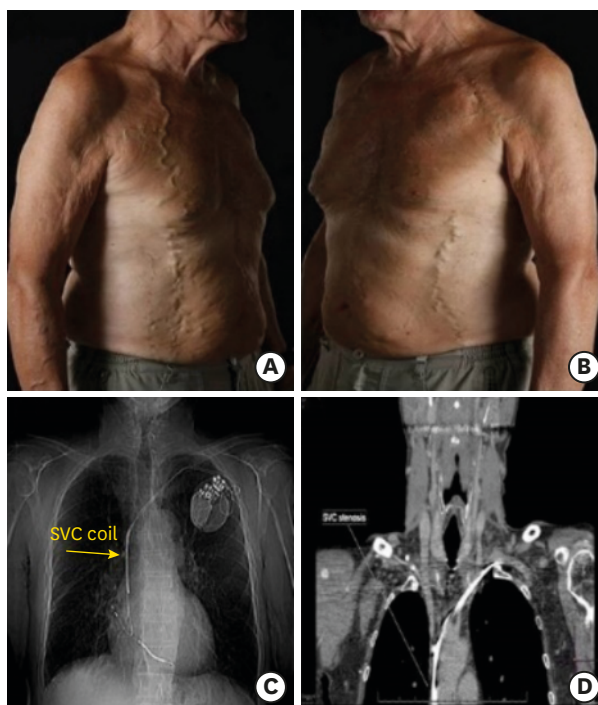
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#### Conflict of Interest

The authors have no financial conflicts of  
interest.

A healthy 79-year-old male with non-ischaeamic cardiomyopathy underwent an implantable cardioverter defibrillator (ICD) insertion 7 years ago following presentation with a haemodynamically significant ventricular tachycardia. A 9 French dual coil ventricular and a 6 French atrial lead were inserted transvenously. While considering an upgrade to a biventricular device due to symptomatic heart failure, striking bilateral symmetrical varicosities over the chest and abdomen (**Figure 1A and B**), suggestive of superior vena cava (SVC) obstruction, were noted. Echocardiography showed severely impaired left ventricular systolic function. On questioning, he admitted to having a fuzzy head and dizziness when bending over. Chest X-ray showed normally positioned dual coil ICD from a left



**Figure 1.** Striking bilateral symmetrical varicosities over the chest and abdomen (A, B), suggestive of SVC obstruction. Chest X-ray showed normally positioned dual coil ICD (C). Computed tomography venogram confirmed stenosis of the SVC (D).  
ICD: implantable cardioverter defibrillator, SVC: superior vena cava.

**Author Contributions**

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infraclavicular approach (**Figure 1C**). Computed tomography venogram confirmed stenosis of the SVC (**Figure 1D**). SVC obstruction is a known entity (in up to 30% cases) in the context of bulky ICD leads. However, it remains asymptomatic and thus often goes unnoticed until the need for device upgrade with a new lead or extraction arises.<sup>1)</sup> Having said that, venous engorgement such as in our case is very rare. One of the common causes of stenosis at the right atrium (RA) - SVC junction is the SVC coil of a dual coil ICD. Superiority of dual, versus single coil leads, in terms of defibrillation efficacy remains to be proven.<sup>2)</sup> Moreover, the SVC coil increases lead complexity, cost, risk of lead failure, and lead removal.<sup>3)</sup> Also, in the absence of a bradycardia indication, the potential of an additional atrial lead to enhance arrhythmia discrimination, reduce inappropriate shocks, rate of hospitalization and mortality has not been borne out by scientific studies.<sup>4)</sup> A SVC coil induces not only wall adhesions, but also sclerotic reorganisation of the venous wall resulting in stenosis and obstruction.<sup>1)</sup>

In our patient, we are managing his heart failure with optimal medical therapy including angiotensin receptor antagonist and neprilysin inhibitor and sodium glucose transporter 2 inhibitor. We anticipate the need for a venoplasty of the SVC-RA junction if we do ever consider upgrading his ICD with a new left ventricular lead. In retrospect, the SVC obstruction may have been prevented if a single coil ICD was implanted in the first place. In contemporary practice of ICD implantation, an SVC coil can cause more trouble than be of benefit to a patient.

**REFERENCES**

1. Lickfett L, Bitzen A, Arepally A, et al. Incidence of venous obstruction following insertion of an implantable cardioverter defibrillator. A study of systematic contrast venography on patients presenting for their first elective ICD generator replacement. *Europace* 2004;6:25-31.  
[PUBMED](#) | [CROSSREF](#)
2. Sunderland N, Kaura A, Murgatroyd F, Dhillon P, Scott PA. Outcomes with single-coil versus dual-coil implantable cardioverter defibrillators: a meta-analysis. *Europace* 2018;20:e21-9.  
[PUBMED](#) | [CROSSREF](#)
3. Epstein LM, Love CJ, Wilkoff BL, et al. Superior vena cava defibrillator coils make transvenous lead extraction more challenging and riskier. *J Am Coll Cardiol* 2013;61:987-9.  
[PUBMED](#) | [CROSSREF](#)
4. Zeitler EP, Sanders GD, Singh K, et al. Single vs. dual chamber implantable cardioverter-defibrillators or programming of implantable cardioverter-defibrillators in patients without a bradycardia pacing indication: systematic review and meta-analysis. *Europace* 2018;20:1621-9.  
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