Venoplasty as an alternative or adjunct for high risk patients referred for transvenous lead extraction.

Leigh Cummins  
Andrew Mamo  
Virag Kushwaha  
Sean Gomes

**Introduction**: Venous obstruction is a relatively uncommon, but potentially serious complication of cardiovascular implantable electronic device (CIED) implantation. Obstruction may present with symptoms or complications from ‘upstream’ venous congestion. Obstruction may also limit the ability to replace non-functional leads or perform device upgrades. Traditionally, patients with obstruction requiring intervention have had lead extraction or open surgery as the only options for intervention. More recently, venoplasty has emerged as an alternative option for the treatment of CIED related venous obstruction. We present data from a consecutive case series of patients managed at our institution for CIED associated venous obstruction, which were managed with venoplasty as an adjunct or alternative to transvenous lead extraction.

**Methods**: We conducted a combined retrospective and prospective examination of cases managed at our institution over a three-year period for venous obstructive complications of CIEDs, and reviewed cases which were managed with venoplasty procedures. All patients were initially referred for transvenous lead extraction. We collected baseline demographic and clinical/device data, obstructive complication data, details of the extraction procedure, and procedural outcome data. We also detail our institution’s typical approach to venoplasty, and highlight the emerging role this procedure has in the management of complex CIED patients.

**Result**: Over the review period we performed five venoplasty procedures for venous obstructive complications of CIEDs. 80% of cases were female. The median age was 61 years [range: 37-75 years]. 80% were performed in order to allow exchange, upgrade or introduction of further CIED leads, which had been otherwise impossible because of venous obstruction. The remaining case was performed (in combination with lead extraction) to alleviate symptomatic SVC obstruction. 80% of cases had two device leads in situ prior to venoplasty; the remaining case had three leads in situ. All cases were successful in overcoming venous obstruction, resulting in passage of new leads in the cases for which this was indicated. All cases had significant improvement in luminal calibre on venogram at the completion of the procedure. The case involving SVC obstruction demonstrated significant symptomatic improvement, and resolution of clinical signs of obstruction at the time of follow-up. There were no peri-procedural complications.

**Conclusion**: Review of these cases demonstrates that venoplasty can be performed safely and effectively in select patients who have venous obstruction complicating CIED implantation. Venoplasty has the potential to relieve symptoms from venous occlusions, as well as to potentiate introduction of new device leads (for example, in the setting of upgrading to a biventricular or defibrillator system, or in the setting of existing lead failure).