



Case Report

Complex Biventricular Pacing - A Case Series

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Abstract

It is established that cardiac resynchronisation therapy (CRT) reduces mortality and hospitalisation and improves functional class in patients with NYHA class 3-4 heart failure, an ejection fraction of $\leq 35\%$ and a QRS duration of $\geq 120\text{ms}$. Recent updates in the American guidelines have expanded the demographic of patients in whom CRT may be appropriate. Here we present two cases of complex CRT; one with a conventional indication but occluded central veins and the second with a novel indication for CRT post cardiac transplant.

Key Words: Biventricular Pacing

Introduction

We present two cases of successful biventricular pacing in patients with complex anatomy. The first is via an occluded superior vena cava, the second in a transplanted heart.

Case One

A 67-year-old man presented with New York Heart Association (NYHA) class 3 heart failure symptoms, left bundle branch block and a first degree AV node block (PR= 400ms). Echocardiography demonstrated a dysynchronous and dilated left ventricle with an estimated ejection fraction of 20%.

His past medical history included dialysis-dependant renal failure and chronic lymphocytic leukaemia. Repeated cannulation of his central venous system had resulted in complete occlusion of the superior vena cava (SVC) and both subclavian veins (**Figure 1**). A functioning right internal jugular (IJ) tunnelled dialysis line was in-situ.

On the basis of comorbidities, he was deemed unsuitable for an epicardial left ventricular lead so he came forward for attempted transvenous approach.

The IJ dialysis line was wired and the length of the track was sequentially dilated with 7mm and 9mm angioplasty balloons. The right subclavian vein was punctured under ultrasound guidance, wired with difficulty and eventually dilated up to 7mm (**Figure 2**). Recanalization

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of the SVC and right subclavian was achieved (**Figure 3**). An active fixation 6French bipolar pacing lead was sited in the right ventricular (RV) apex. A larger french defibrillation lead (for CRT-D) could not be accommodated. The coronary sinus was cannulated with a multipurpose shaped guiding catheter and a Medtronic Attain Ability® LV lead advanced to the terminal portion of a lateral vein. A 5Fr passive fixation pacing lead was advanced to the right atrium. A paediatric dialysis catheter was re-sited in the right IJ vein. The final lead positions were satisfactory (**Figure 4**).

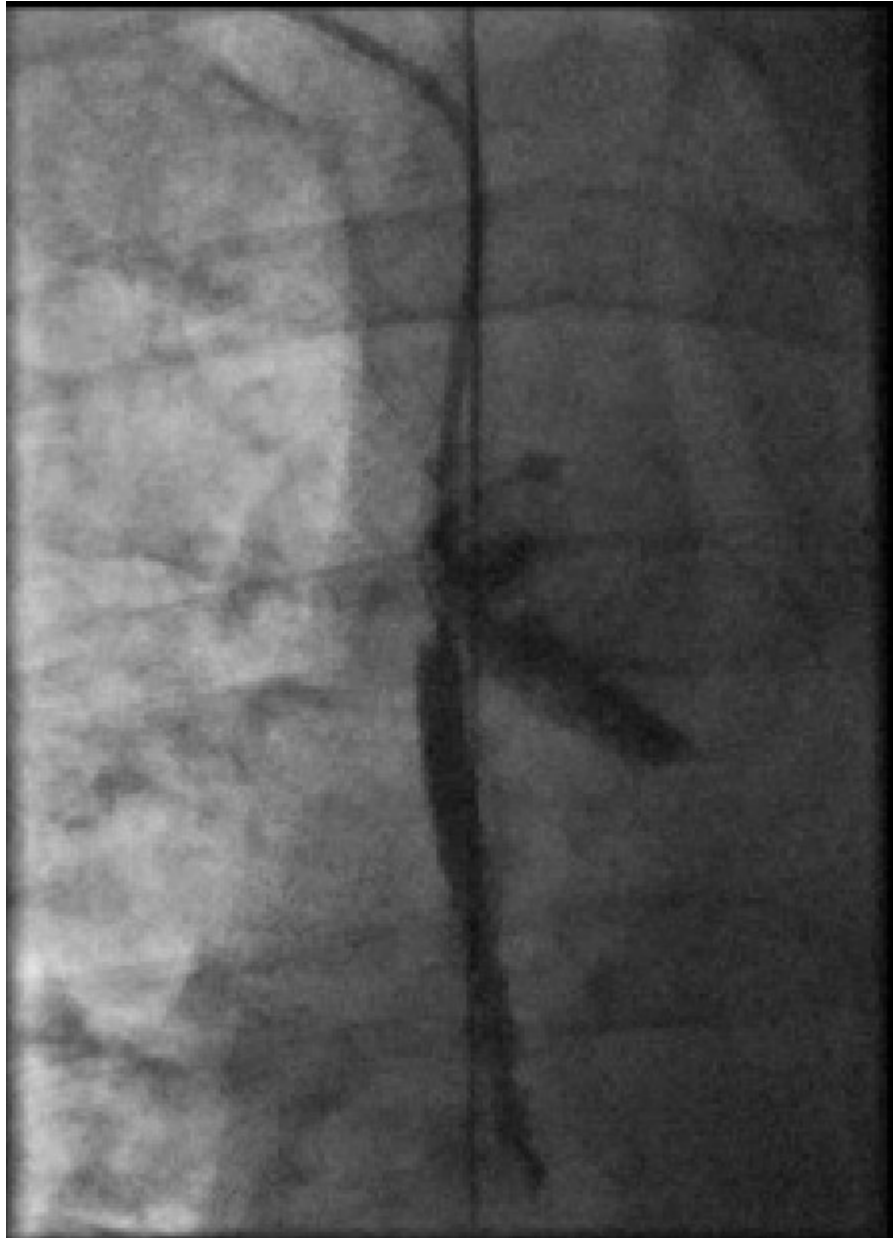


Figure 1: Superior Vena cava and Subclavian chronic total occlusions

The procedure was completed without complication. At 4 months, the patient’s functional class was NYHA 2 with significant improvements in LV ejection fraction, mitral regurgitation and end diastolic dimensions (**Table 1**) demonstrated on echocardiography.

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