TTE guided synchronization to optimize AV synchronous leadless pacemaker programming

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Introduction

Transvenous pacemakers are associated with major complications [1]. Transcatheter leadless pacemaker has reduced the incidence of these complications and the recent accelerometer based atrial sensing algorithm permits restoration of atrio-ventricular synchrony [1]. We report utilizing cardiac output measurements using Transthoracic Echocardiography (TTE) to determine optimal programming for leadless pacemaker.

A 69-year-old Caucasian male with a past medical history significant for schizoaffective disorder was admitted to the intensive care unit with acute encephalopathy secondary to a urinary tract infection and superficial skin infection. He responded to tailored antibiotic therapy with fluid management. He was noted to have prolonged sinus pauses and complete heart block and underwent semi-permanent pacemaker implantation after exonerating reversible causes. Two of his antipsychotic medications (olanzapine and lithium) were held with improvement of sinus node function. However, he would require these medications for management of his schizoaffective disorder, and thus underwent uneventful Atrio-Ventricular (AV) synchronous leadless pacemaker implantation. His baseline HR were in the 50s and although he had tolerated asynchronous pacing with his semi-permanent device, optimal cardiac outputs with bedside TTE were compared with VVI 60 and VDD 40 to permit tracking of sinus bradycardia (Figure 1 & Table 1). With similar cardiac outputs, final programming was established at VDD 40.
Single-chamber pacemakers are used in those who do not require frequent pacing, or have vascular access issues or certain comorbidities. However, these devices do not provide the benefit of AV synchrony [2]. Further, several patients with complete heart block may have concomitant sinus node dysfunction [3]. Therefore, the programming algorithm at a higher pacing rate would lead to loss of AV sensing. Our patient represents this clinical dilemma. We utilized echocardiography to determine cardiac output as above. This simple maneuver improved our bedside decision making in that in the setting of sinus node dysfunction, tracking the sinus rate albeit slower, had more favorable hemodynamic effects with transthoracic thoracic guided programming.

**References**

