

# A Case of Difficult RV Lead Placement of Single Chamber Implantable Cardioverter-Defibrillator (ICD) with Atrial Septal Defect (ASD) Amplatzer Septal Occluder Device Delivery System

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**Tel:** + 919971470733**Citation:** Sharma M (2018) A Case of Difficult RV Lead Placement of Single Chamber Implantable Cardioverter-Defibrillator (ICD) with Atrial Septal Defect (ASD) Amplatzer Septal Occluder Device Delivery System. Interv Cardiol J Vol.4 No.2:4

## Abstract

**Introduction:** A case of difficult RV lead placement of single chamber ICD with (ASD) Amplatzer septal occluder device delivery system. Implantation of pacemaker leads can be challenging sometimes. Various non-conventional tools have been used in such difficult cases.

**Case report:** We report a case of single chamber ICD implantation in a patient with severe LV dysfunction as primary prevention strategy where RV lead placement was done with the use of 80 cm 10 F delivery system of ASD septal occluder amplatzer device.

**Conclusion:** Innovative lead placement strategies with the use of appropriately selected tools is helpful in facilitating difficult cases.

**Keywords:** ICD; RV lead; Difficult anatomy; Amplatzer closure device sheath

**Received:** July 03, 2018; **Accepted:** August 30, 2018; **Published:** September 04, 2018

## Introduction

Implantation of pacemaker/Implantable cardioverter-defibrillator (ICD) leads can be challenging sometimes. There are multiple steps involved during implantation and one can face problems in any of steps. There may be issues with puncture because of distorted anatomy of subclavian vein, then because of sharp and acute bends of subclavian vein. Problems can arise in manipulation and placement of leads. Dilated cardiac chambers and valvular regurgitation may create problems during RV lead placement. We report a case of single chamber ICD implantation in a patient with severe LV dysfunction for primary prevention where RV lead placement was done with the use of long 80 cm 10 F ASD amplatzer septal occluder device delivery system (amplatzer torVue 45).

## Case Report

A 70-year-old male presented with breathlessness on exertion of 6 months duration. He was in NYHA III. Further evaluation revealed severe LV dysfunction with dilated LV and left ventricle ejection fraction of 30%. Coronary angiography was done with 5

F Tiger catheter through right radial route which revealed right dominant normal epicardial coronaries. He was listed for ICD implantation for Primary prevention of sudden cardiac death [1].

Patient was taken up for ICD insertion (Medtronic) through left subclavian approach. Patients was cleaned and draped. Left subclavian puncture was taken under fluoroscopic guidance. A 50 cm, 0.38 mm J wire was introduced. Sub-cutaneous pocket over left pectoral area was made with blunt dissection. It was followed by 7 F dilator over the J tip wire and puncture site was dilated. RV lead (A 7 F active fixation 65 cm Medtronic pacing lead) was introduced through the 7 F, 14 cm, peel away introducer sheath but lead could not be manipulated because of sharp bend of subclavian vein to SVC. Multipurpose slit-able sheath (Medtronic Attain Command 6250-MP2 (6 F) was also taken but still lead did not cross the sharp bend.

Then, 80 cm 10 F (ASD) Amplatzer septal occluder device delivery system (amplatzer torVue 45) was taken. At first attempt, this sheath went straight into azygos vein. It was realigned into IVC and then RV lead was introduced through it.

The whole procedure took 2 hrs and 20 minutes (Fluoroscopy

time 17.04 minutes, dose 876 cGycm<sup>2</sup>). Post procedure lead position was checked. Good final threshold was achieved at the end of procedure.

## Discussion and Conclusion

Implantation of RV lead can sometimes be challenging. Operators have used innovative strategies to counter these difficulties. Various kind of guiding sheaths has been used in coronary sinus lead implants [2] and pacing lead implants. Other strategies used are self-shaped stylets and pre-shaped stylets. Guiding sheaths has been commonly used for pacing lead implants in pediatric patients and coronary sinus lead implantation [3].

However, there has been no reports of use of Atrial Septal

Defect (ASD) Amplatz Occuder Device delivery system sheath for facilitation of RV lead implantation. In our case, the sheath provided extra length and support, so RV pacing lead could be positioned easily with this. It provided a very good contact between endocardium and lead tip.

Sometimes with use of innovative techniques, problems of optimum threshold after implantation of leads can occur. During implantation, the presence of a stable R wave and current of injury suggests a good pacing site and optimum threshold can be expected at such site [4]. Innovative lead placement strategies with the use of appropriately selected tools is helpful in facilitating difficult cases. These tools may not be part of conventional equipment typically used for single chamber ICD implantation.

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