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PERFORATION BY PERMANENT PACEMAKER LEAD A RARE COMPLICATION: A CASE REPORT

Muhammad Furrakh Maqbool[1], Shehzad Tawb[2], Ahmed Noeman[3], Muhammad Sajid[4]

[1,3-4]Department of Cardiology, Punjab Institute of Cardiology, Lahore, Pakistan

[2]Department of Electrophysiology, Punjab Institute of Cardiology, Lahore, Pakistan

Address for Correspondence:

Muhammad Furrakh Maqbool,

Department of Cardiology, Punjab Institute of Cardiology, Lahore, Pakistan

E-Mail: justfurrakh@hotmail.com

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Contribution

MFM conceived idea, did literature review and final drafting. ST reviewed case report. AN,MS helped in acquiring photographs and related material. All authors contributed significantly to the submitted manuscript.

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ABSTRACT

Permanent pacemaker lead perforation is a quiet rare but life-threatening complication. Perforations can be soon after procedure, early and late. Multiple factors are involved in evaluating the cause of lead perforation. We report a case of a delayed lead perforation in a patient after 6 months of permanent pacemaker implantation, who presented with syncopal episodes.

Key Words: Pacemaker lead perforation, Delayed perforations, Pacemaker malfunctions.

INTRODUCTION

With advancement in the field of electrophysiology the number of patients with intra cardiac devices and permanent pace maker are increasing day by day. Lead perforation is a rare and potentially lethal complication of these devices. Depending upon the time of implantation lead perforation can be divided into acute, sub-acute and delayed. [1] Multiple factors are responsible for lead perforation. Early diagnosis and treating the cause of lead perforation can save patients life.

CASE REPORT

A 70 years old female presented to emergency with recurrent episodes of syncope for last 20 days. Dual chamber permanent pacemaker was implanted six months back for the same complaint. Patient remained asymptomatic for six months and now presented with recurrent syncopal episodes. These episodes were preceded by dizziness for a few seconds and then loss of consciousness with fall that lasts for a minute, not associated with any focal neurological deficit. With this complaint she was referred to Punjab institute of cardiology where ECG (Figure1) showed sinus rhythm with sinus arrest and failure to capture. Physical examination was unremarkable. She was admitted for pace maker interrogation and routine chest X-ray and echocardiography (Figure 2, 3) was advised. All blood tests were normal. Echocardiography showed pacing lead passing from right atrium to right ventricle and possibly piercing right ventricle apex, the same suspicion was on chest x-ray so CT-scan was planned. Subsequent CT-scan (Figure 4-5) showed penetration through right ventricular myocardium and tip of pacemaker lead is restrained by parietal pericardium. Patient was admitted in

ward and she was put on next elective list. Decision was to leave the perforating lead in place to avoid any hemodynamic compromise and implant new tined lead with replacement of generator. Temporary pacemaker was inserted under flouro guidance, the old perforating lead get buried in place and a new tined lead implanted with replacement of generator.

Figure 1 : ECG Showing Sinus Rthym With Sinus Arrest And Loss Of Capture

Figure 2: ECHO Showing RV Lead

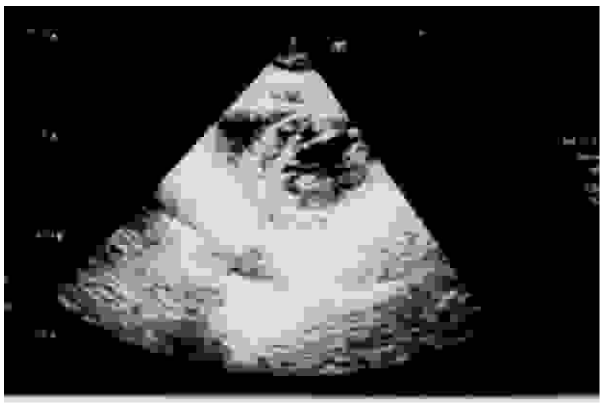

Figure 3: CXR Showing 3 Leads After New Lead Implantation

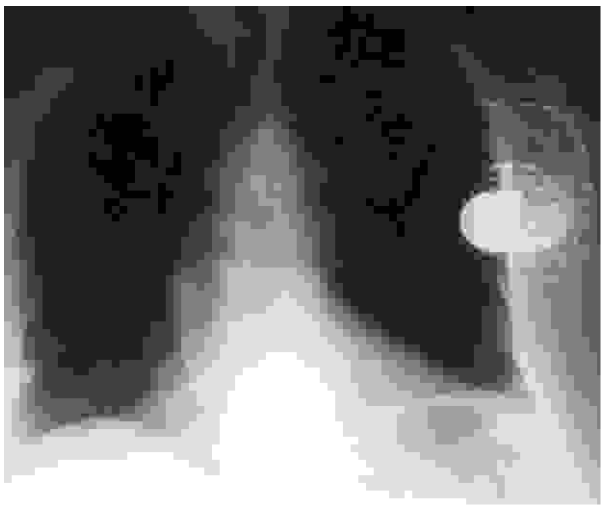

Figure 4: CT Showing Myocardial Perforation By Rv Lead

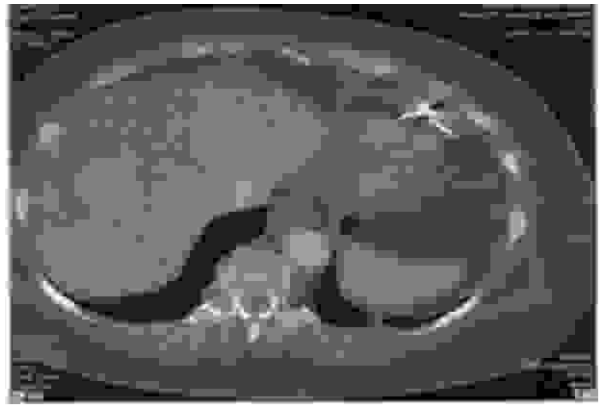

Figure 5: CT Showing RV Lead in Saggital View

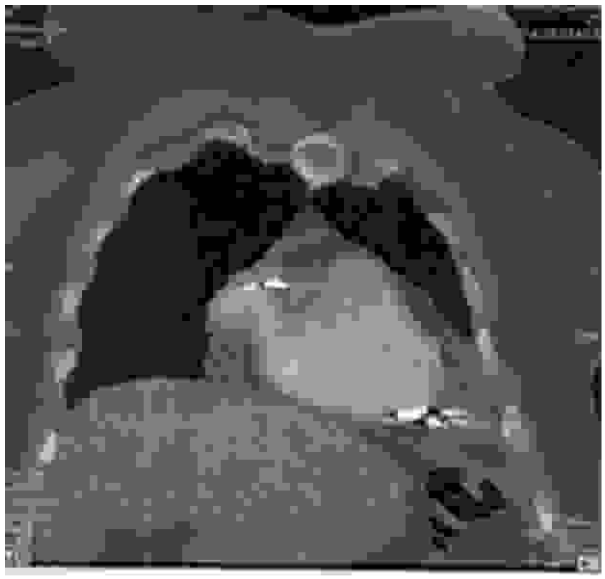

Figure 6: ECG After Implantation of New Lead

DISCUSSION

Complications regarding pacemaker or intra-cardiac devices implantation can be divided in two broad categories pocket complications and lead related complications. Pocket complications include pocket hematoma, infection , erosion, migration of pacemaker and twiddler `s syndrome. Lead complications include perforation, dislodgement, infection, vein thrombosis and migration of lead.[2] Out of these, lead perforation is a rare and potentially lethal complication. Reported incidence is 0.1-0.8% for permanent pacemaker leads and 0.6-5.2% for ICD leads.

Depending on the time of implantation lead perforations can further be divided in acute, sub-acute and delayed. Acute perforations occur within first 7 days and reported incidence is 1-7%.Sub-acute perforations occur within 30 days but after 7 days and accounts for 1%. Delayed perforations are very rare with reported incidence of 0.1% and occur after 30 days.[3] Longest delay reported in one case where perforation came into attention after 7 years of implantation but exact time of perforation was unknown.[4]

Factors responsible for lead perforation are further described in literature as patient factors and lead factors. Patient factors include advanced age, low BMI, use of anticoagulants and longer fluoroscopy time during lead implantation while temporary pace maker lead insertion, use of steroids, use of active fixation leads and thickness and stiffness of leads used are lead factors considered responsible for lead perforations.[1] Most common chamber susceptible for perforation by lead is right atrium with reported incidence of about 15% due to thinner wall of right atrium.[5] Thicker electrodes, active fixation leads, appendage location, device type, anticoagulation status and age of the patient are all contributing factors. Perforated lead may traverse through pericardium into lung fields. Right ventricle is the second most common site and the incidence is 6%.RV free wall perforation has highest risk as free wall is thinner than interventricular septum. Fate of lead depends where the lead implanted and where it ends up. Coronary sinus perforation is least common 2% and cardiac tamponade and pericarditis are mostly presentations.[6]

High index of suspicion is required for rapid diagnosis. Acute perforations mostly present with chest pain, dyspnea, syncope, pericardial effusion and tamponade while delayed perforations with hemopericardium, pericarditis, pneumothorax, diaphragmatic or chest wall stimulation and loss of capture. Imaging studies including chest x-ray, fluoroscopy and echocardiography are helpful but modality of choice is CT scan.[7] Management depends upon timing of complication. Acute complications are managed by lead repositioning and with serial echocardiographic monitoring where as in management of delayed perforations lead can be left in place to avoid hemodynamic compromise and anew tined lead can be placed. Thoracotomy option is reserved if there are technical difficulties.[8]

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