Ventricular Tachycardia Immediately Post Permanent Pacemaker Implantation, Case Report and Literature Review

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Key Words:

Ventricular tachycardia, permanent pacemaker, complications

Case:

An 84 year-old gentle man with no past medical history of note, presented with symptomatic complete heart block. A temporary pacemaker was inserted and subsequently planned for a VVIR permanent pacemaker.

Conventional pacemaker implantation was done with a passive fixation lead. Implantation was un-eventful and the pacemaker was secured to an acceptable position at the RV apex. Acute pacing parameters were satisfactory.

Few hours after transfer to the day ward, the patient experienced two episodes of non-sustained ventricular tachycardia followed few hours later by an episode of ventricular fibrillation which required DC shock (figure1). The patient then continued to have recurrent non sustained VT. A bedside echocardiography was un-remarkable with no evidence of pericardial collection. Portable CXR showed that the pacemaker lead has retracted to the mid of the RV cavity and is almost perpendicular to the myocardium with no enough slack (figure 2). The instability of the lead and the odd position were felt to be the cause of the recurrent

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arrhythmia. A decision was made to immediately take the patient to the catheterization laboratory for pacemaker lead revision.

The pocket was re-opened and the lead was re-directed to the right ventricular apex. The myocardium was quite irritable during this procedure and was proved impossible to pass the lead to the RV outflow tract without developing a sustained ventricular tachycardia. RV outflow tract navigation was abandoned and the lead was directly guided to the RV apex with comfortable slack and stable position. Pacing parameters were excellent. The lead was secured and attached to the generator. Pocket was closed and the patient was then transferred to the cardiac care unit. 24 hour monitoring was un-eventful with no further arrhythmia. The patient was discharged home with planned routine follow up at the pacemaker clinic. He remained arrhythmia free at follow up.

Discussion and literature review:

Retraction and migration of a passive fixation lead is a frequent event post permanent pacemaker implantation. It is most likely that the ventricular arrhythmia in this patient was due to the migration of the lead leading to this odd position of the pacemaker. The arrhythmia is a direct result of irritation of the myocardium by the tip of the unstable and mobile lead. This was augmented by the fact that the lead was almost perpendicular to the myocardium rendering irritation more pronounced. The lead is also a tine lead and- unlike screw-in leads- the hooks probably added and exacerbated this irritation.

Ventricular arrhythmia post permanent pacing is frequently reported in the literature 1.

Lindsay AC [2] reported a case of ventricular tachycardia and recurrent syncope four months after dual chamber pacemaker implantation. Patient's right ventricular pacing wire had wrapped around the tricuspid annulus. The arrhythmia disappeared after repositioning. Bohm et al. presented another case of symptomatic non-sustained ventricular tachycardia induced by mechanical irritation of the right ventricular outflow tract [3]. Repositioning of pacemaker loop eliminated the rhythm disturbance. Lefroy reported another case of ventricular tachycardia following VVI pacemaker implantation due to fusion of a ventricular extrasystole with a pacemaker beat [4], whereas pacemaker stimulus on T wave was reason for VT in the case described by Freedman [5].

Conclusion:

Ventricular dys-rhythmia is a frequent complication of permanent pacemaker implantation. In most cases the abnormal position of the pacemaker lead is the cause of the problem and the arrhythmia usually settles post repositioning of the lead to the stable RV apex.

Abnormal position of a pacemaker lead should be considered whenever a patient with a permanent pacemaker develops a new onset ventricular arrhythmia. All efforts should be exerted to revise and reverse this abnormal position.

Figure 1: post implantation ventricular Fibrillation. *Note the impeded pacing spikes*

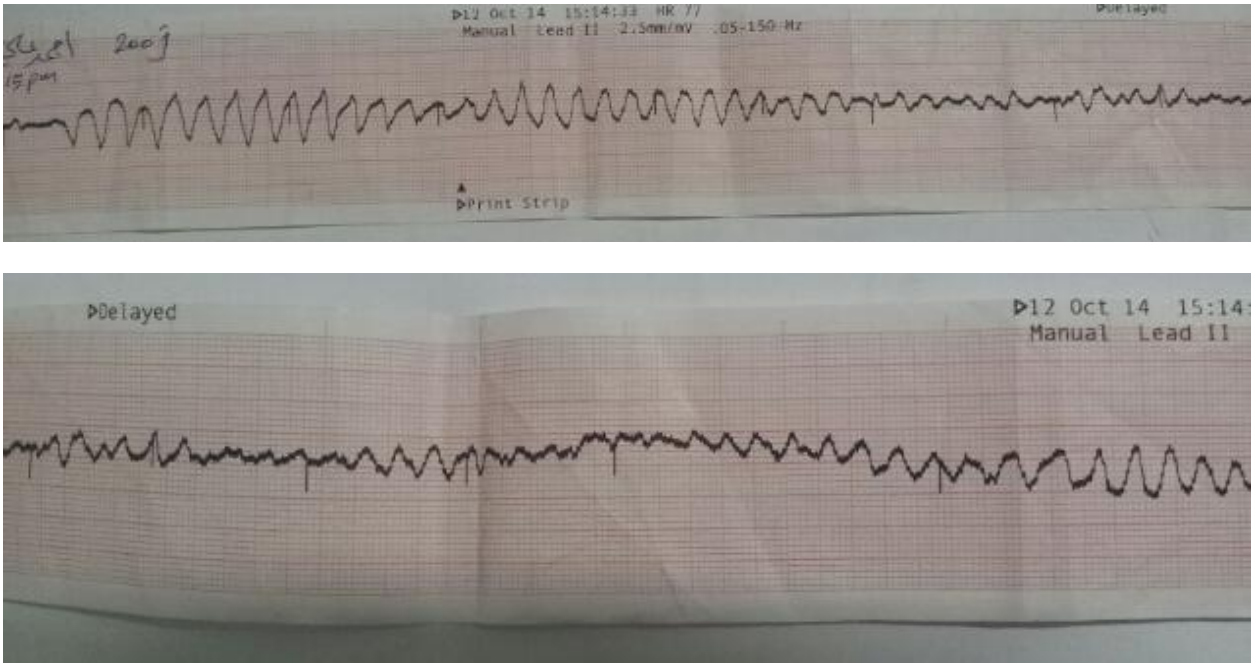


Figure 2: Chest X ray few hours post implantation. The passive fixation lead has migrated significantly and is lying almost perpendicular to the myocardium.

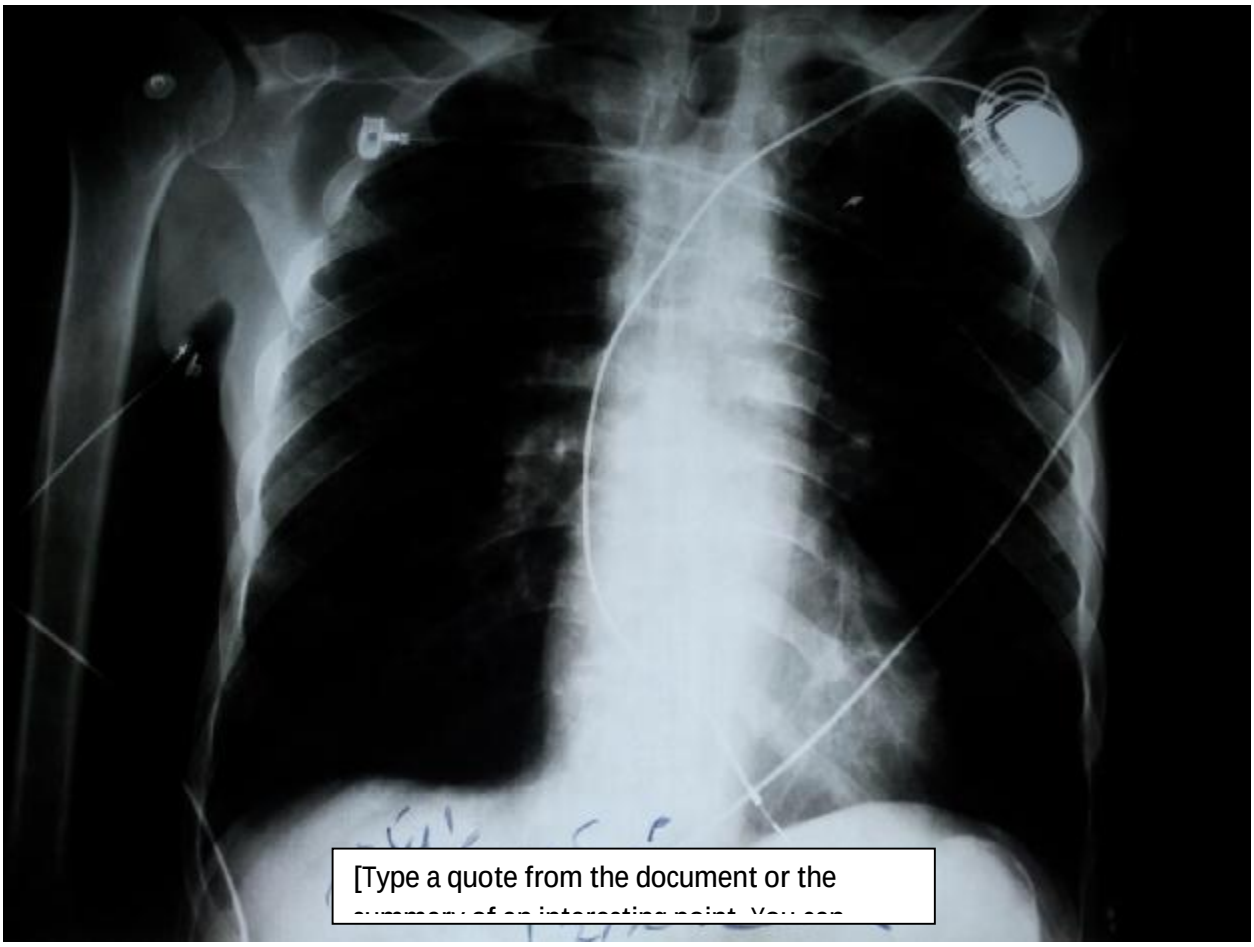
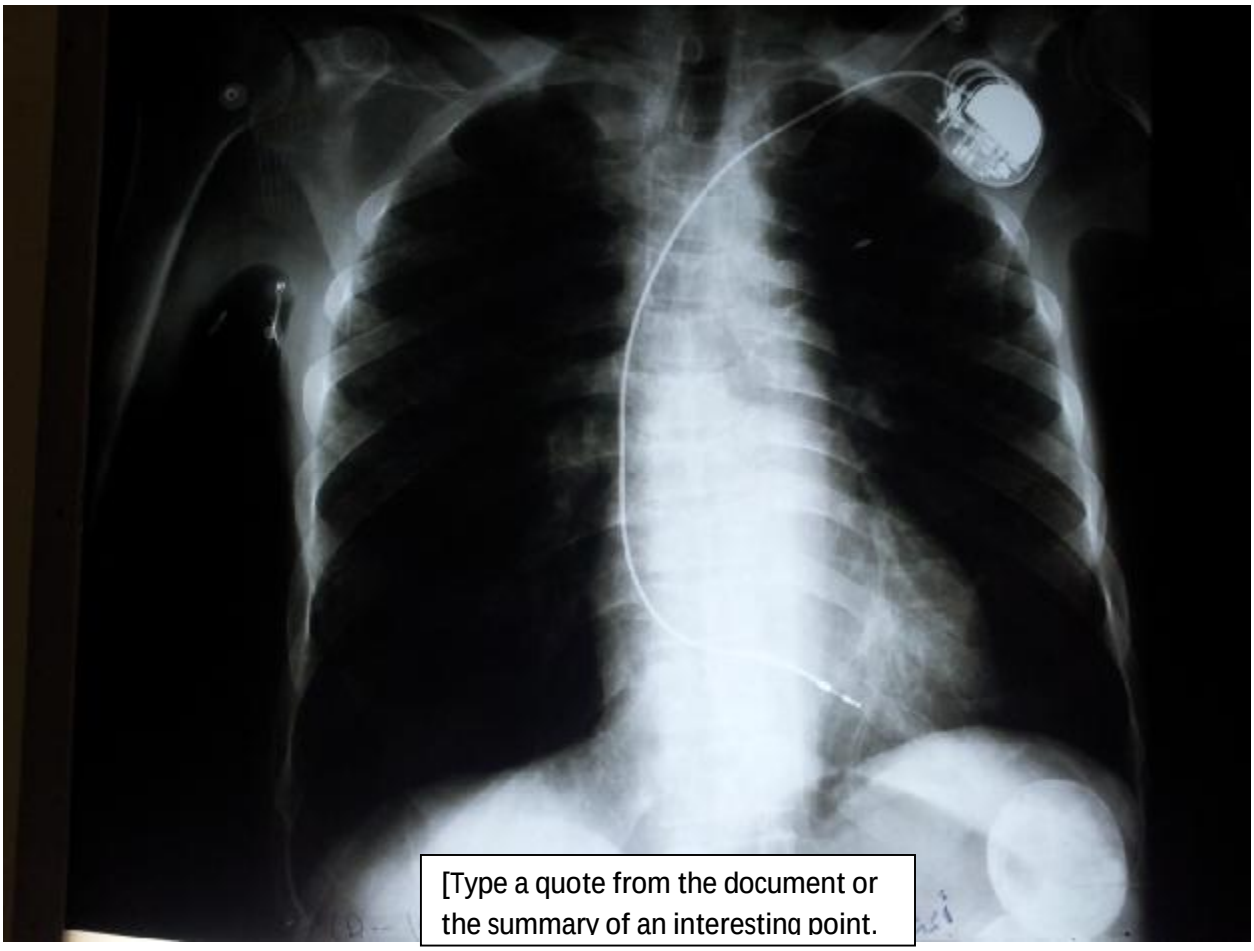

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Figure 3: Chest x ray after lead revision:



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