

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Electrocardiogram Quiz – Case 13

An 81-year old man presented to the emergency department of our hospital reporting sensation of abdominal pulsations of a few hours duration. The patient had been implanted a permanent dual chamber pacemaker system, due to syncope and a diagnosed sick sinus syndrome, two weeks earlier. At the emergency department he was hemodynamically stable with normal vital signs. The 12-lead surface ECG is depicted below.

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2013, 30(5):632–633

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Questions

- What abnormalities are depicted on the 12-lead ECG?
- What could be the reason for the above abnormalities?

Comment

Pacemakers may cause undesirable complications during and after implantation. Classification of pacemaker complications include: Pocket complications, such as pocket hematoma, infection, allergic reactions, skin erosion, pacemaker migration, and lead



Figure 1

complications, such as acute perforation, dislodgement, infection, migration, pneumothorax, hemothorax, air embolism, venous thrombosis, superior vena cava syndrome, pericarditis.

Pacemaker lead displacements can be defined as any other pacemaker position change, whether the functionality of the pacemaker is affected or not. However, only those displacements that provoke a malfunction in the pacing system are clinically relevant. There are early displacements, which occur within the first six weeks after implantation, and late displacements, after this period of time. Early displacements are more frequent than late ones and they usually affect atrial leads. The incidence of early displacements is 1% in VVI pacemakers and 5.2% in DDD pacemakers (3.8% of the cases affecting atrial leads and 1.4% ventricular leads). Early displacements are the most frequent cause of reintervention, involving atrial leads in the majority of cases.

Dislodgement has been classified as “macrodislodgement” and “micro-dislodgement”. The first is radiographically evident, while the latter is not; however capable to produce an increase in capture threshold and eventually a loss of capture while keeping normal lead impedance values.

Information about the causes of displacement is scarce and it is often difficult to relate lead displacements to a specific etiology. Extracardiac stimulation usually involves the diaphragm or pectoral or intercostal muscles. Twiddler’s syndrome comprises a rare complication in which the patient turns and rotates the generator on its long axis and, because of traction, causes the lead displacement. Ipsilateral phrenic nerve can be stimulated, resulting in diaphragmatic pacing and sensation of abdominal pulsations. Even rhythmic arm twitching has been reported, as a result of pacing the brachial plexus. In Reel’s syndrome the patient rotates the generator on its transverse axis rolling the lead around it, provoking a lead displacement. Finally, direct trauma over the system may produce not only a lead or connection fracture but also a system displacement. The condition has been also related to intense respiratory therapy.

The approach to lead displacement is different depending on time from implantation, patient clinical status, pacemaker dependency, lead displaced (atrial or ventricular, active or passive fixation) and degree of malfunction of the device. In early displacements, reopening the pouch and lead reposition are possible since the distal end of the lead has not been fixed by fibrous tissue. In late displacements, when surgical repositioning is not feasible, a new lead is implanted percutaneously, cancelling the displaced one.

Our patient was diagnosed with displacement of the ventricular lead resulting in chaotic pacing as depicted on the ECG, and extracardiac stimulation probably involving the diaphragm. He underwent an uneventful lead re-implantation and was discharged with explicit instructions.

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Diagnosis: Permanent pacemaker ventricular lead displacement