

Permanent Pace Maker Lead Vegetation along with Tricuspid Valve Leaflets Involvement - A Case Report

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Abstract:

Permanent pace maker (PPM) lead vegetation is a rare condition. Diagnosis is made by persistent fever after PPM lead implantation, blood culture, 2D & M-mode Echocardiography and confirmed by Transoesophageal echocardiography. Many literatures showed that Staphylococcus epidermidis is the most responsible organism as it can grow on plastic material. In this case, we confirmed the vegetations in PPM lead and Tricuspid valve (TV) leaflets by Transoesophageal echocardiography.

Case Report:

A 40 year middle aged diabetic gentle man had a history of complicated acute myocardial infarction with complete heart block four months back. He received a VVI pacemaker via right cephalic vein on October 2010 in another hospital. One month later he had high fever (104° F) and was treated empirically by his family physician. After two weeks of fever, he was suffering again from persistent fever and admitted several times in different hospitals and treated with high dose of antibiotics. Then he was referred to Banga Bandhu sheikh Mujib medical University for further investigations. The fever was persistent in nature associated with shivering. Total WBC count was very high. But blood culture was negative as he got several antibiotics. Transthoracic echocardiography showed a mobile mass attached to pace

maker lead near Tricuspid valve which was most likely vegetation (Fig:1,2). Endocarditis was suspected, blood culture has been sent and treatment with intravenous high dose antibiotics started.

Transoesophageal echocardiography was done on 27th January 2011 which revealed numerous mobile vegetations were seen in right atrium, some of them were attached with PPM lead and some of them were attached with Tricuspid valve leaflets and also right atrial free wall and moderate Tricuspid regurgitation (Fig: 3,4,5). The large mobile mass (30X 18 mm) attached with pacemaker lead in right atrium (Fig: 3). Two small mobile vegetations are attached with two TV leaflets (Fig: 4).

The patient was referred to Cardiothoracic surgery department for removal of the whole lead system by thoracotomy.

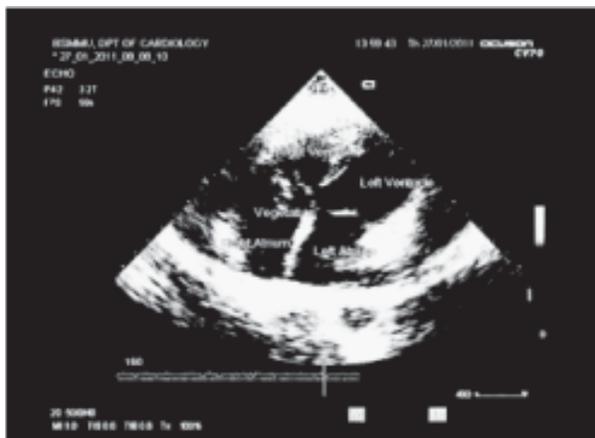


Fig:1 & 2: Transthoracic echocardiography reveals- mobile mass attached to pace maker lead near Tricuspid valve.

Transoesophageal echocardiography reveals-

Fig:3: A big mass within right atrium which is attached with PPM lead.



Fig:4: Two separate small vegetations are attached with Tricuspid valve leaflets.



Fig:5: Vegetation is attached with PPM lead.

Discussion:

The reported incidence of infection of the permanent pacemaker system is between 0.3% and 12.6%. This may involve infection of generator pocket (appearing two to five weeks after implantation) or infection of the electrodes (appearing after an average of 33 weeks) and may be associated with bacteraemia, with or without concomitant infective endocarditis. Documented septicaemia is rare (1-3%)^{1,2,3}. To the best of our knowledge the incidence of Permanent pacemaker lead endocarditis has not been reported in this country. Septicaemia is diagnosed when at least two haemocultures are positive or when one culture is positive together with at least one clinical manifestation of septicaemia (Fever, chills, raised white blood cell count, sedimentation). Review of the literature presents some

predisposing factors like repeated interventions which are responsible for 66-73% of the pacemaker infections. But in our case, there was no history of reintervention (like repositioning, lead replacement). The incidence of infection decreases with a higher degree of aseptic care. Older series noted that the highest rate occurs when implantation is performed in the Xray department or angiography unit rather than the operation room⁴. General recommendations now allow implantation in angiography or electrophysiology unit, as long as strictly aseptic conditions are present⁵. Other predisposing factors for lead infection are post implantation pocket haemorrhage, erosion, necrosis or infection. Some systemic factors contributing to a higher incidence are diabetes mellitus, a thin skin, the use of corticosteroids, age, intravenous catheters, neoplasm, the use of anticoagulants, temporary

pacing, dermatological diseases, and other infectious foci^{1,4,6}.

Early diagnosis of a pacemaker lead infection is difficult. One should be suspicious in the case of a patient with a pacemaker with persisting bacteraemia or fever without another focus of infection. Endocarditis should be considered until proven otherwise. The use of transoesophageal echocardiography is becoming increasingly useful as a diagnostic technique and it seems to be much more sensitive in identifying left side endocarditis and lead vegetations than the Transthoracic view^{1,2,6,7}. Transthoracic echocardiography is less valuable as inadequate precordial acoustic window and also the pacemaker lead produces reverberations. But the Transoesophageal approach reveals a better view of the right atrium and the superior venacava. One study showed that in patients with the clinical suspicion of an infected permanent transvenous pacemaker, Transoesophageal echocardiography is superior in detecting lead vegetations⁸. Transthoracic echocardiography detected vegetations in only two patients whereas transoesophageal echocardiography demonstrated them in seven of 10 patients. In a prospective study of 23 patients⁹, transoesophageal echocardiography was positive in 21 and its use contributed to early diagnosis. Pacemaker lead infection is a life

threatening situation. Haematogenous dissemination can produce relapsing septic episodes, pulmonary symptoms from emboli and involvement of the tricuspid valve leading to regurgitation or, rarely, stenosis.¹⁰ Treatment of an infected pacemaker system depends on the knowledge of the clinical course and microbiological features. Most pacemaker lead infections are caused by staphylococci^{1,11} other microorganisms may also be responsible (such as corynebacterium, enterococci). Early infections after implantation tend to be caused by *Staphylococcus aureus*, whereas late infections are caused by *S epidermidis*^{7,11}. A complete removal of all the foreign material is suggested when pacemaker system infection occurs^{3,7,11}.

Conclusion:

We report our experience in diagnosis of pacemaker lead infection. This is a rare but life threatening condition. It can be prevented by strict aseptic precautions. The

diagnosis must be considered in patients with fever, positive blood cultures (especially staphylococci) or septicaemia and a transvenous permanent pacemaker. It has been shown that Transoesophageal echocardiography is very helpful in the diagnosis. The results of several series indicate it is best to remove the whole pacemaker system by lead extraction or thoracotomy when endocarditis or septicaemia is present. In our case, the diagnosis of pacemaker endocarditis was confirmed by Transoesophageal echocardiography. The endocarditis appeared after one month after PPM implantation. To the best of our knowledge it is the first case of PPM vegetation reported in home.

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