Transvenous pacing and manipulation of heart in coronary artery bypass grafting: A word of caution

Sir,

Pacing catheter induced right ventricular (RV) perforation is not uncommon. Due to stiffness of the pacing catheter and improper handling while insertion, many times pacing catheter perforates the RV free wall leading to pericardial effusion and tamponade. However, intra-operative RV perforation due to pacing catheter, after its successful and uneventful insertion has never been reported previously. Here, we report a case of intra-operative RV perforation due to temporary pacing catheter due to excessive manipulation of heart while doing off-pump coronary artery bypass grafting.

A 56-year-old man with triple-vessels disease, having

complete heart block with temporary transvenous pacing catheter *in situ*, was taken for off-pump coronary artery bypass (OPCAB) surgery. Left anterior descending artery (LAD) was revascularised using reverse saphenous vein graft with minimal manipulation of heart. In order to get proper exposure while doing obtuse marginal artery (OM) grafting, the heart was lifted and retracted to the right and stabilised with the help of Octopus stabilisation system. Suddenly it was noted that the anterior free wall of RV was contused and there was a small rent with pacing catheter peeping through it [Figure 1]. Immediately the heart was relaxed by removing the octopus stabiliser. An epicardial pacing wire was put on the anterior surface of RV and pacing was started. The RV perforation was controlled with a pledgetted mattress suture and the transvenous pacing catheter was withdrawn slowly as the suture was tightened. Rest of the grafting were done with epicardial pacing and further intra-operative course was uneventful.

Emergency placement of a temporary transvenous cardiac pacemaker offers potential lifesaving benefits, as the device can definitively control heart rate, ensure effective myocardial contractility, and provide adequate cardiac output in selected circumstances. The procedure includes the establishment of central venous access, usually by a right internal jugular or left subclavian vein; although the femoral vein is an acceptable alternative, especially in patients who are more likely to bleed. The complications with temporary pacing catheter insertion are not uncommon (22% of all patients), and can range from femoral haematoma, pneumothorax, perforation of right ventricle leading to bleeding, cardiac tamponade and even death (6%).[1]

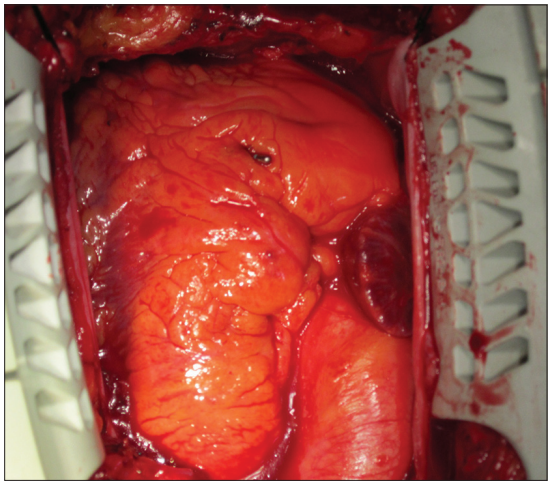

Figure 1: Pacing catheter peeping through RV rent

Various transvenous pacing catheters are available with basic similarities. Most are bipolar, 3 Fr to 5 Fr in size, and approximately 100 cm in length. Lines marked at 10-cm intervals on the catheter surface can be used to estimate catheter position. Catheters are classified as flexible, semi-floating, or rigid/non-floating catheters. The latter group carries a higher risk of cardiac perforation, and thus they are generally used only under fluoroscopic guidance, where their stiffness yields the benefit of easier manipulation.[2] Advancements in cardiology have resulted in the almost standard use of glycoprotein IIb/IIIa inhibitors, aspirin, and intravenous (IV) heparin or LMWH in patients with non-ST- and ST-segment elevation myocardial infarction (MI) who undergo early percutaneous intervention (PCI). Combined use of temporary pacing wires and the IIb/IIIa receptor antagonists may be associated with an increased risk of this serious complication, like tamponade[3,4] and RV perforation. Coronary artery bypass grafting, whether on-pump or off-pump, requires frequent manipulation of heart for proper exposure of target vessels. Due to stiff or rigid nature of pacing catheter, manipulation of heart may cause damage to the tissue which may in turn lead to perforation of RV. Hence to avoid this complication, we firmly advise, not to manipulate the heart with temporary pacing catheter *in situ*, rather epicardial pacing wires should be taken and pacing is started as soon as the pericardium is opened and the temporary RV pacing catheter should be removed in pacing dependent patients while doing any type of heart surgery, which necessitates positioning or manipulation of heart.

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