Myocardial Penetration of a Temporary Pacing Wire Detected by Transthoracic Echocardiography

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A 67-year-old woman was performed with the surgery of mitral commissurotomy for mitral stenosis in 1985. She had presented with a two-week history of fatigue and exertional dyspnea and was admitted to a nearby hospital. Physical examination on admission showed bradycardia with atrial fibrillation. Chest radiography showed cardiomegaly and vascular congestion consistent with congestive heart failure.

The patient was inserted a temporary pacing wire, therefore resulted in slight symptomatic improvement. However, one week later, the temporary pacemaker was troubled, and the pacing wire was exchanged. Thereafter, the patient developed exertional dyspnea; transthoracic echocardiography (TTE) was then performed, revealing moderate mitral regurgitation and severe tricuspid regurgitation. It was determined at that point to have the patient be transferred to our hospital because of operative indication. The day prior to her transfer, the patient complained of new onset palpitations. The electrocardiogram showed transient ventricular premature beats and pacing failure. Upon admission to our hospital, the patient had no signs of congestive heart failure. We detected that the temporary pacing wire clearly penetrated the right ventricular myocardium, and the tip of the wire was postulated outside the myocardium using TTE (Figure. 1). There was no pericardial effusion. We detected moderate mitral regurgitation and severe tricuspid regurgitation. We consulted with the cardiac surgeons, and it was determined that the patient would undergo urgent surgery.

The intraoperative findings showed that the tip of the pacing wire had penetrated the myocardium, but not the epicardium (Figure. 2). The site of penetration was patchy by pledgetted prolene purse string suture. Our patient had been performed a tricuspid ring annuloplasty and insertion of a permanent epicardial pacemaker. The patient made an uncomplicated recovery and was discharged.

From previous reports, cardiac perforation is a rare but serious complication of temporary transvenous cardiac pacing. If this complication is suspected, it is imperative that the diagnosis be made immediately. TTE will clearly reveal an anechoic zone around the heart, suggesting pericardial effusion if the cause is cardiac rupture or tamponade [3].

Color Doppler echocardiography will demonstrate the deep recesses with penetration of color Doppler signals in patients with left ventricular non-compaction cardiomyopathies [4]. In this case, we did not perform color Doppler echocardiography at the site of penetration; however, we detected penetration of the pacing wire via 2-dimensional echocardiography.

This case shows the efficacy of utilizing bedside, noninvasive transthoracic echocardiography for the diagnosis of cardiac penetration with a complication of temporary cardiac pacing.

References

Fig. 1. Transthoracic echocardiogram demonstrating a penetrated pacing wire into right ventricular myocardium.
PM: pacing wire, RV: right ventricle

Fig. 2. Intraoperative view of the right ventricle with a tip of the pacing wire (PM).

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