

# Inadvertent Transarterial Temporary Pacemaker Lead Placement: An Unusual Complication

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Temporary pacemakers are utilized in emergency situations when severe bradyarrhythmias secondary to acute myocardial infarction (AMI) and to non-AMI related cardiac disorders occur. Mal-position of pacemaker lead is a rare, underreported complication during pacemaker implantation. The incidence of inadvertent lead malposition has been estimated at 0.34% with abnormal thoracic anatomy, underlying congenital heart disease, prior surgery, and inexperienced operator reported as major risk factors.<sup>1</sup>

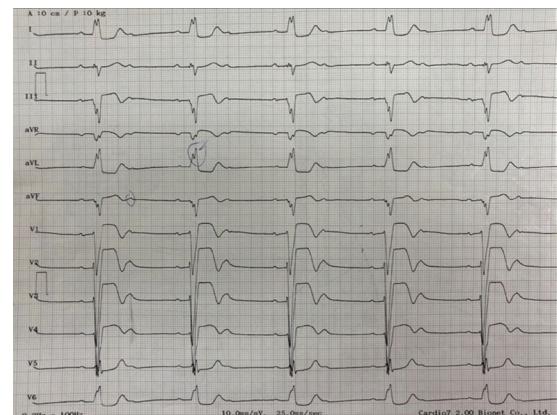
## Case Report

We report the case of a 77-year-old male who underwent temporary pacemaker lead implantation after a symptomatic 2:1 Mobitz type II second-degree block and left bundle branch block conduction (Figure 1). The temporary pacemaker was implanted apparently through the right jugular vein without fluoroscopic guidance, only by monitor guidance. After medical stabilization the patient was referred to our tertiary care center for further management. A cardiovascular system examination was unremarkable. Electrocardiogram showed a paced left bundle branch block pattern; however, with

a high threshold stimulation level. The x-ray showed an abnormal lead path (Figure 2). A computed tomography angiography was performed that documented an intra-arterial lead with entry into the right common carotid artery and with the tip crossing the aortic valve and ending in the left ventricular outflow tract (Figure 3). Removal of the lead and relocation of the temporary pacemaker was requested by interventional cardiology. The fluoroscopy showed a temporary pacemaker lead with an arterial course with a loop in the ascending aorta and the tip crossing the aortic valve (Figure 4). A puncture of the right common femoral vein was performed, and a 6 French introducer sheath was placed. The temporary pacemaker lead was advanced to the right ventricle (Figure 5). The intra-arterial lead was removed and an angiogram was performed through the introducer sheath, confirming the arterial site (Figure 6). The introducer sheath was subsequently removed without complications.

## Discussion

In this case, the temporary pacemaker lead was unintentionally malpositioned through arterial access,



**Figure 1.** Initial electrocardiogram with 2:1 Mobitz type II second-degree block and left bundle branch block conduction.

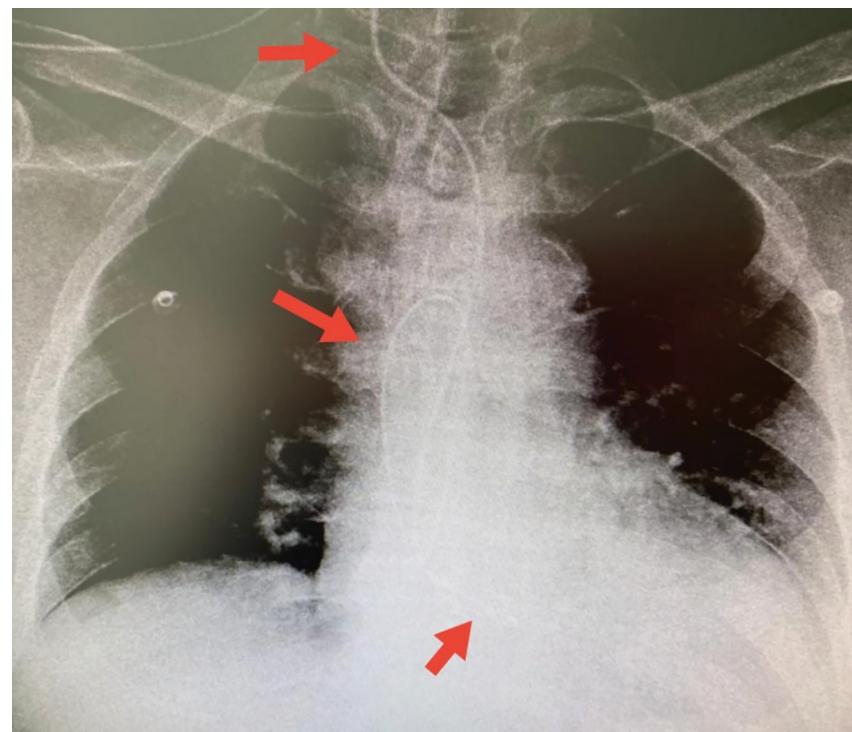
suspected due to a high threshold stimulation level. An x-ray and computed tomography scan confirmed an abnormal lead path.

Early recognition required careful reading of the 12-lead surface electrocardiogram pacing morphology and other imaging modalities, including chest x-ray, computed tomography, and fluoroscopic images.

Complications of transarterial lead malposition include thromboembolic events, valvular and coronary ostial damage, aortic dissection, and vascular complications from arterial access.<sup>2,3</sup> Rapid identification of lead position is critical during implantation and immediately after the procedure, with immediate correction necessary, if malpositioning is detected, to prevent these events.<sup>4</sup>

## Conclusion

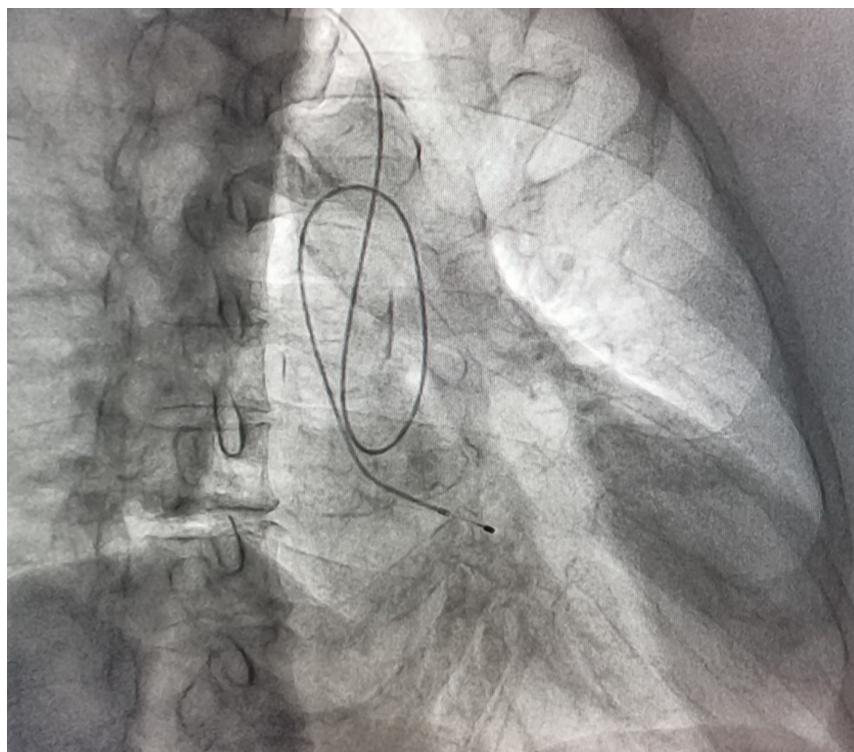
Inadvertent pacemaker lead malposition is a rare but potentially serious complication. In emergency situations and without fluoroscopic guidance, such complications do occur. The present case was intended to alert physicians about this rare complication and highlight the importance of prevention and early detection, especially under fluoroscopic guidance. ■



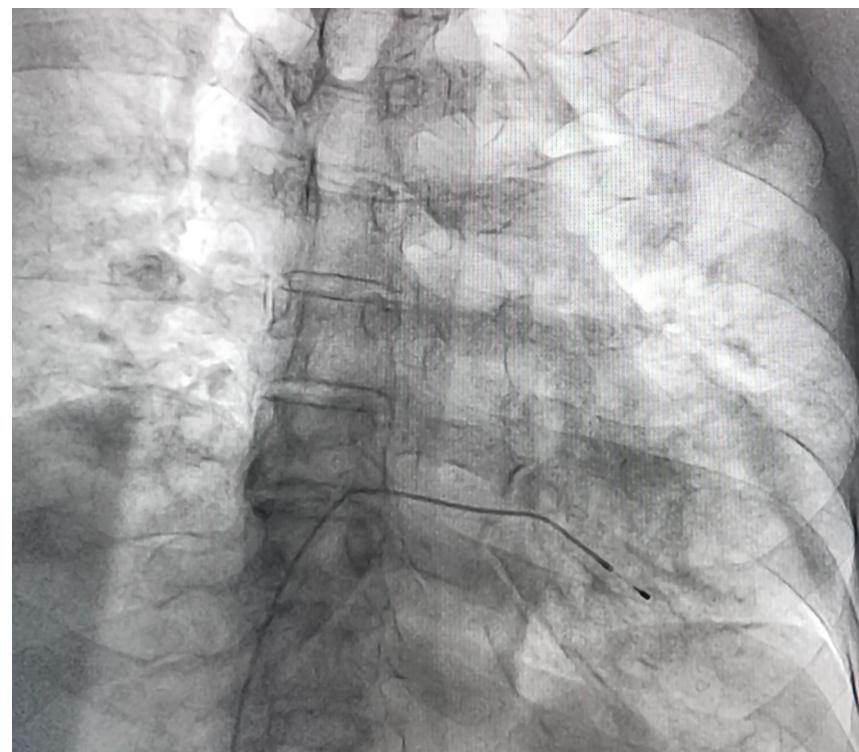
**Figure 2.** X-ray showed an abnormal lead path.



**Figure 3, Video 1** (online with the article at [CathLabDigest.com](http://CathLabDigest.com)). A computed tomography scan documented an intra-arterial lead with entry into the right common carotid artery, with the tip crossing the aortic valve and ending in the left ventricular outflow tract.

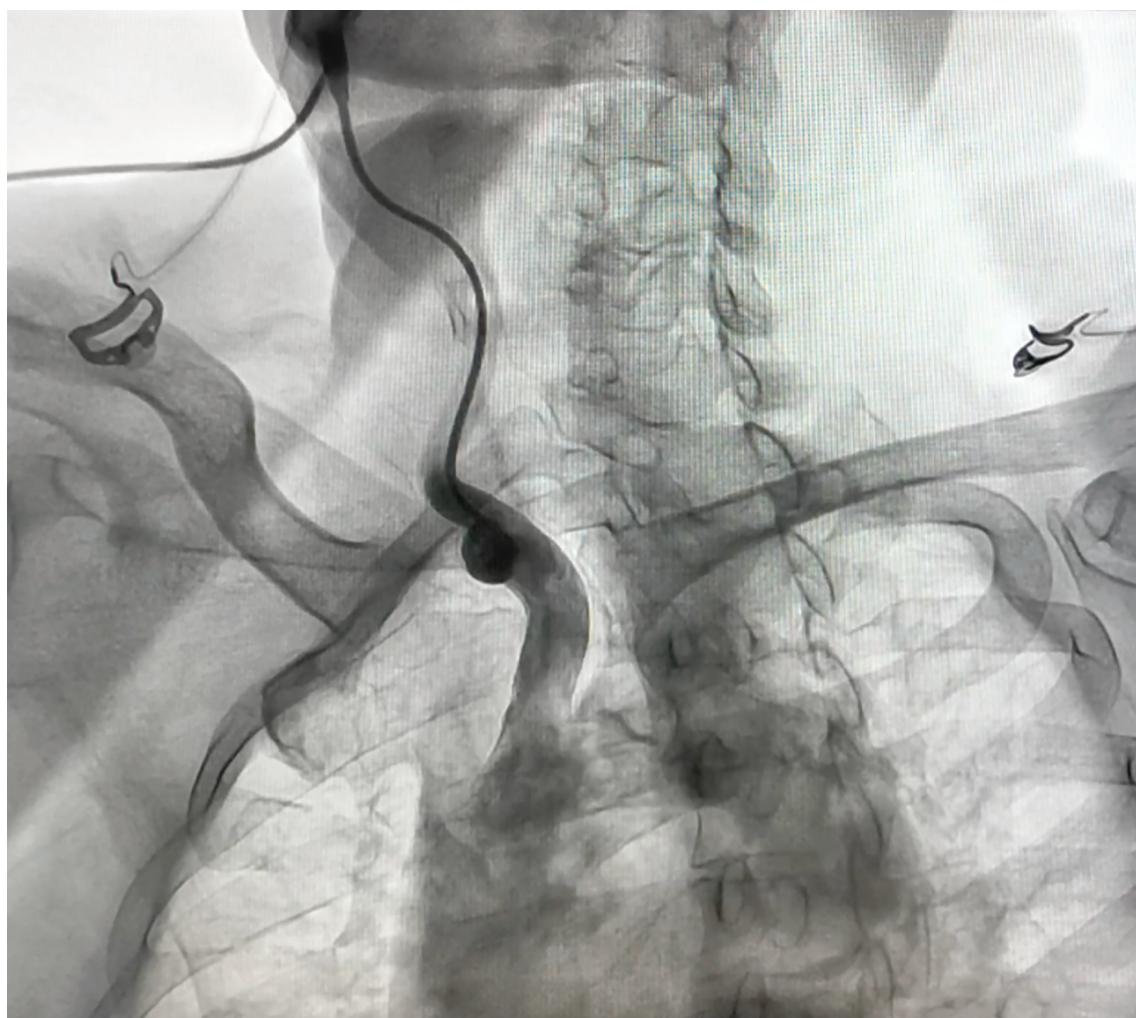


**Figure 4.** The fluoroscopy showed a temporary pacemaker lead in an arterial course with a loop in the ascending aorta and the tip crossing the aortic valve.



**Figure 5.** Adequate lead placement in the right ventricle.

**Inadvertent pacemaker lead malposition is a rare but potentially serious complication. In emergency situations and without fluoroscopic guidance, such complications do occur.**



**Figure 6, Video 2 (online with the article at CathLabDigest.com).** Angiogram through the introducer sheath confirming the arterial site.

#### References

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