

# World Journal of *Cardiology*

*World J Cardiol* 2024 June 26; 16(6): 306-369



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The WJC is now abstracted and indexed in Emerging Sources Citation Index (Web of Science), PubMed, PubMed Central, Scopus, Reference Citation Analysis, China Science and Technology Journal Database, and Superstar Journals Database. The 2024 Edition of Journal Citation Reports® cites the 2023 journal impact factor (JIF) for WJC as 1.9; JIF without journal self cites: 1.9; 5-year JIF: 2.3; JIF Rank: 123/220 in cardiac and cardiovascular systems; JIF Quartile: Q3; and 5-year JIF Quartile: Q2. The WJC's CiteScore for 2023 is 3.3 and Scopus CiteScore rank 2023: Cardiology and cardiovascular medicine is 189/387.

**RESPONSIBLE EDITORS FOR THIS ISSUE**

Production Editor: *Ying-Yi Yuan*; Production Department Director: *Xiang Li*; Cover Editor: *Yun-Xiaojiao Wu*.

**NAME OF JOURNAL**

*World Journal of Cardiology*

**ISSN**

ISSN 1949-8462 (online)

**LAUNCH DATE**

December 31, 2009

**FREQUENCY**

Monthly

**EDITORS-IN-CHIEF**

Ramdas G Pai, Dimitrios Tousoulis, Marco Matteo Ciccone, Pal Pacher

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/1949-8462/editorialboard.htm>

**PUBLICATION DATE**

June 26, 2024

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## Management of a patient with an unusual trajectory of a temporary trans-venous pacing lead

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**Specialty type:** Cardiac and cardiovascular systems

**Provenance and peer review:** Invited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review report's classification**

**Scientific Quality:** Grade B, Grade C

**Novelty:** Grade A, Grade B

**Creativity or Innovation:** Grade B, Grade C

**Scientific Significance:** Grade B, Grade B

**P-Reviewer:** Denman RA, Australia; Li Q, China

**Received:** April 28, 2024

**Revised:** June 3, 2024

**Accepted:** June 13, 2024

**Published online:** June 26, 2024

**Processing time:** 57 Days and 11.8 Hours



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### Abstract

Perforation of the right ventricle during placement of pacing wires is a well-documented complication and can be potentially fatal. Use of temporary pacemaker, helical screw leads and steroids use prior to implant are recognised as risk factors for development of post-permanent pacemaker effusion. We reported an unusual case of pacing wire perforating interventricular septum into the left ventricle that occurred during the implant procedure performed in another institution. After the preoperative work-up and transfer to our tertiary cardiothoracic centre, the patient underwent successful surgical management. In conclusion, early recognition and timely diagnosis using advanced multimodality imaging can guide surgical intervention and prevent unfavourable consequences of device-related complications.

**Key Words:** Ventricular perforation; Lead perforation; Pacing

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**Core Tip:** Early recognition and timely diagnosis using advanced multimodality imaging can guide surgical intervention and prevent unfavourable consequences of device-related complications.

**Citation:** Acharya M, Kavanagh E, Garg S, Sef D, De Robertis F. Management of a patient with an unusual trajectory of a temporary trans-venous pacing lead. *World J Cardiol* 2024; 16(6): 314-317

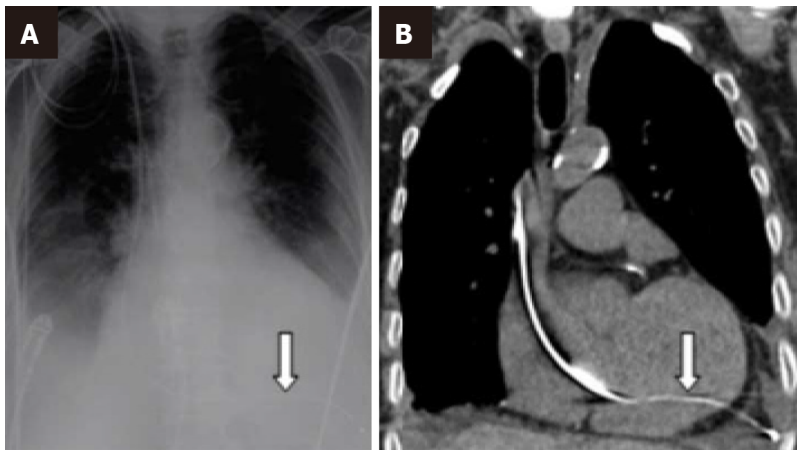
**URL:** <https://www.wjgnet.com/1949-8462/full/v16/i6/314.htm>

**DOI:** <https://dx.doi.org/10.4330/wjc.v16.i6.314>

## INTRODUCTION

Perforation of the right ventricle during placement of pacing wires is a well-documented complication and can be potentially fatal[1]. Up to 9% of patients can experience a variety of complications after permanent pacemaker (PPM) implantation such as infections, battery or programming issues, lead migration, or lead fracture[2]. Pericardial effusion, consistent with cardiac perforation, can be detected in up to 1.2% of patients after the PPM implantation. Use of temporary pacemaker, helical screw leads and steroids use prior to implant are recognised as risk factors for development of post-PPM effusion[1].

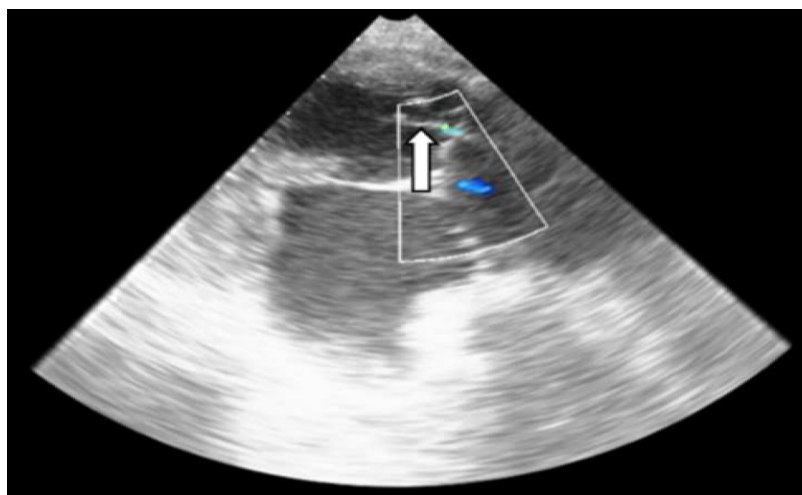
We reported an unusual case of pacing wire perforating interventricular septum into the left ventricle. An 81-year-old woman presenting at a district hospital in decompensated heart failure with fast atrial fibrillation and pleural effusions underwent emergency temporary trans-jugular venous pacing using passive leads for complete heart block after beta-blockade for rate control. On the next day, a loss of PPM capture was detected on monitoring and prompted further work-up. Chest radiography (Figure 1A, arrow) and computed tomography (Figure 1B, arrow) showed that the pacing wire had traversed from the inter-ventricular septum into the left ventricle, and through the left ventricular myocardium to lie within the left pleura.



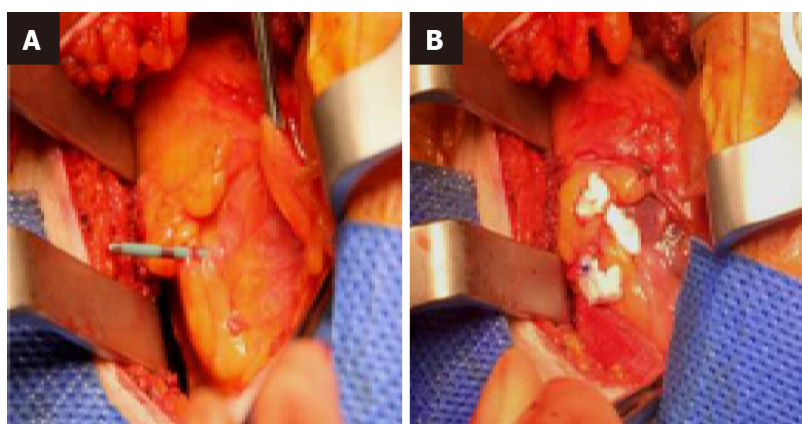
**Figure 1** Chest radiography and computed tomography. A: Chest radiography (arrow); B: Computed tomography (arrow) showing that the pacing wire had traversed from the inter-ventricular septum into the left ventricle, and through the left ventricular myocardium to lie within the left pleura.

The patient was transferred to our tertiary cardiothoracic centre. Transoesophageal echocardiogram on admission demonstrated severe Carpentier IIIB mitral regurgitation from chordal entrapment by the pacing wire (Figure 2, arrow), without pericardial effusion. Multi-disciplinary team consensus was obtained for surgical pacing wire removal. Following left anterior thoracotomy in the 6<sup>th</sup> intercostal space, a Teflon-pledgeted 3-0 polypropylene purse-string suture was tied around the protruding pacing wire at the left ventricular apex (Figure 3) alongside transvenous lead withdrawal. The patient made a satisfactory recovery with only mild mitral regurgitation detected postoperatively.

Placement of temporary pacing leads has been associated with a 3-fold increased risk of cardiac perforation[1]. Therefore, in a Mayo Clinic study, which included more than 4200 patients who had PPM implantation, authors postulated that temporary pacemaker placement should be avoided unless essential[1]. In the case of symptomatic malpositioned pacing lead within the left ventricle, emergent surgical extraction is generally required[3]. Similarly, Mortensen *et al*[4] reported on a case of ventricular lead perforation late after PPM implantation with isolated haemothorax and no cardiac effusion or tamponade[4]. Definitive diagnosis was established only after fluoroscopy, and the surgical treatment included lead removal, repair suture of the right ventricle and placement of an epicardial electrode *via* thoracotomy. On the other hand, Otaal *et al*[5] reported a case of ventricular perforation in a patient who presented with mild left-sided chest pain 3 days after PPM implantation[5]. Diagnosis was confirmed with a computed tomography which detected hemopneumothorax[6]. The patient underwent successful surgical management with the placement of an epicardial pacemaker lead. For some of the above-mentioned reasons, leadless PPM is recently becoming an alternative form of transvenous pacing since it has been demonstrated that lead- and pocket-related complications can be reduced using this relatively novel approach[7]. However, the pacing position of leadless PPM can be more challenging as compared to conventional PPM, requiring careful preimplantation evaluation.



**Figure 2** Transoesophageal echocardiogram on admission demonstrated severe Carpentier IIIB mitral regurgitation from chordal entrapment by the pacing wire (arrow), without pericardial effusion.



**Figure 3** Following left anterior thoracotomy in the 6<sup>th</sup> intercostal space. A: A Teflon-pledgeted 3-0 polypropylene purse-string suture was tied around the protruding pacing wire at the left ventricular apex; B: Alongside transvenous lead withdrawal.

## CONCLUSION

In our opinion, early recognition and timely diagnosis using advanced multimodality imaging can guide surgical intervention and prevent unfavourable consequences of device-related complications.

## FOOTNOTES

**Author contributions:** Acharya M and Kavanagh E designed the research study; Acharya M, Kavanagh E and Garg S wrote the original draft of the manuscript; Sef D and De Robertis F analyzed the literature and edited the draft of the manuscript; All authors have read and approve the final manuscript.

**Conflict-of-interest statement:** All the authors report no relevant conflicts of interest for this article.

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**S-Editor:** Li L

L-Editor: A

P-Editor: Yuan YY

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## REFERENCES

- 1 **Mahapatra S**, Bybee KA, Bunch TJ, Espinosa RE, Sinak LJ, McGoon MD, Hayes DL. Incidence and predictors of cardiac perforation after permanent pacemaker placement. *Heart Rhythm* 2005; **2**: 907-911 [PMID: [16171740](#) DOI: [10.1016/j.hrthm.2005.06.011](#)]
- 2 **Kumar P**, Skrabal J, Frasure SE, Pourmand A. Pacemaker lead related myocardial perforation. *Am J Emerg Med* 2022; **53**: 281.e1-281.e3 [PMID: [34511285](#) DOI: [10.1016/j.ajem.2021.08.081](#)]
- 3 **Iwata S**, Hirose A, Furui I, Matsumoto T, Ozaki M, Nagasaka Y. Right ventricular perforation, pneumothorax, and a pneumatocele by a pacemaker lead: a case report. *JA Clin Rep* 2021; **7**: 69 [PMID: [34505188](#) DOI: [10.1186/s40981-021-00470-8](#)]
- 4 **Mortensen K**, Aydin MA, Goldmann B, Deuse T, Willems S, Ventura R. Fluoroscopy to assess late heart and lung perforation by a permanent ventricular pacemaker lead. A case complicated by isolated hemothorax. *Int J Cardiol* 2008; **128**: 104-106 [PMID: [17706810](#) DOI: [10.1016/j.ijcard.2007.04.189](#)]
- 5 **Otaal PS**, Budakoty S, Kumar R, Singhal MK. Hemopneumothorax due to subacute right ventricular perforation by a pacemaker lead with subtle clinical presentation. *J Family Med Prim Care* 2022; **11**: 780-783 [PMID: [35360808](#) DOI: [10.4103/jfmpe.jfmpe\\_448\\_21](#)]
- 6 **Sef D**, Birdi I. Clinically significant incidental findings during preoperative computed tomography of patients undergoing cardiac surgery. *Interact Cardiovasc Thorac Surg* 2020; **31**: 629-631 [PMID: [32865197](#) DOI: [10.1093/icvts/ivaa160](#)]
- 7 **Lee JZ**, Mulpuru SK, Shen WK. Leadless pacemaker: Performance and complications. *Trends Cardiovasc Med* 2018; **28**: 130-141 [PMID: [28826669](#) DOI: [10.1016/j.tcm.2017.08.001](#)]





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