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Migration of Epicardial Pacing Wire to the Pulmonary Trunk: A Case Report

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Abstract

Percutaneous retrieval of retained epicardial pacing wires is largely reported to be safe and effective. We have described a case report of delayed presentation of retained epicardial pacing wire, which migrated to the pulmonary trunk, in a patient 1 year post coronary artery bypass graft surgery. The retained wire was safely removed percutaneously. There are an increasing number of cases reporting migration of epicardial pacing wires to important structures, with a combination of unknown and documented serious outcomes. The aim of this case report is to emphasise the importance of highlighting the risk of retention of these wires to surgeons and their patients. Furthermore, the reasons and implications of this happening should be explored.

Keywords

Pulmonary Artery, Catheter Angiography, Epicardial Pacing Wire

1. Introduction

Intra-operative insertion of temporary epicardial pacing wires during cardiac surgery is performed to pace arrhythmias that develop in the post-operative period. [1] They are only temporary, as patients have these removed soon after surgery with gentle traction. Often, if the wire is not easily removable, it is cut just under the skin and expected to remain in the soft tissue between the pericardium and chest wall. [2] There have been several case reports describing cases in which the wires migrate to other structures, so generally, the retention of epicardial wires by cutting flush with the skin surface is not recommended. [3] The loss and retrieval of varying endovascular foreign bodies have been reported in many single-center case series and case reports, often with patients most commonly presenting asymptomatically [4].

2. Case Summary

A 63-year-old man who presented with chest tightness and dyspnea was investigated for coronary artery disease. He had a background of diabetes mellitus, hypertension, and dyslipidaemia and was a smoker. After a positive stress test, he underwent coronary angiography, which identified three-vessel diseases. He underwent an uneventful coronary artery bypass graft (CABG). During this CABG, the patient received a left internal mammary artery (LIMA) graft to the left anterior descending (LAD), and saphenous vein grafts to the first obtuse marginal, right acute marginal, and right posterior descending. Epicardial pacing wire was applied. The patient underwent an uneventful post-operative recovery. The pacing wire was reported to be completely removed by our surgical team post-operatively.

At 9 months post-CABG, the patient continued to suffer from moderate dyspnea, which was thought to be due to chronic obstructive pulmonary disease (COPD) secondary to cigarette smoking.

Follow-up at one year post-CABG, a CT scan (Figure 1) was performed, which showed a foreign body—most probably a wire—in the pulmonary artery, likely to be an epicardial pacing wire that migrated to the right ventricle, ending up in the pulmonary artery. The case was discussed in the multidisciplinary meeting, and the consensus was that the risks involved in removing this wire outweighed any benefits and that the aforementioned patient's residual symptoms were likely to be unrelated. The patient chose to have the wire removed nonetheless, and this was done successfully by interventional radiology at 16 months post-CABG. This was retrieved by gooseneck snare (Medtronic, 710 Medtronic Parkway, Minneapolis, MN 55432-5640 USA) and inserted through the right femoral vein under local anesthesia without any complications (Figure 2).

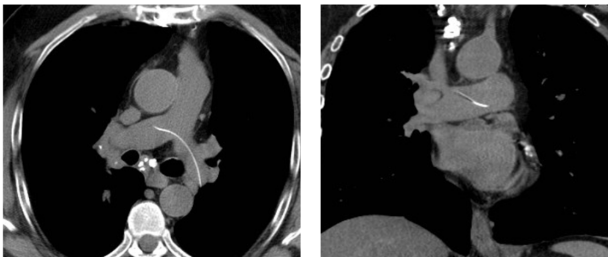

Figure 1. Axial and coronal chest CT showing retained epicardial pacing wire in the pulmonary artery.

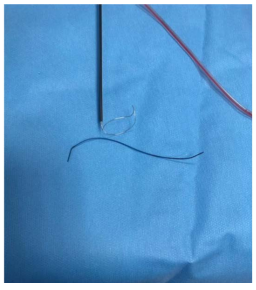

Figure 2. Photograph of retrieved epicardial pacing wire and gooseneck snare.

3. Discussion

Temporary epicardial pacing wires have been highly appreciated in their use post-cardiac surgery as a diagnostic and temporary intervention, safety netting the patient into the post-operative period.

The case summarized above, however, demonstrates that there is a clear risk associated with these wires breaking and remaining, of which the significance is unclear. Percutaneous removal is the most widely used method of removal of retained intravascular foreign bodies as it has shown to be highly effective with a low complication rate. [5] Removing foreign bodies from the pulmonary artery is done under local anesthesia through the femoral or jugular veins. An alternative method of removal if percutaneous removal fails or is not an option is removal by open heart surgery, which carries a significant increase in risk.

Our patient was experiencing increasing dyspnea, reduced exercise tolerance, and oedema post-CABG; however, the identification of the pacing wire was coincidental almost one year after the surgery. It is difficult to ascertain if the wire was contributing to symptoms or if this was only a coincidental finding. Furthermore, the true risks associated with keeping the wire in the pulmonary trunk are unclear, and so the patient was given the choice. Serious outcomes were reported by Meier *et al.* in a case describing erosion of the wire through the right atrium from the pulmonary artery, resulting in cardiac arrest. [6] Another case by Juchem *et al.* reported a complication of prosthetic valve endocarditis 2 years following the insertion of epicardial pacing wires during a mitral valve replacement operation. [7] A case similar to ours was reported by Worth *et al.* in which the wire had been found in the pulmonary artery 24 years post-CABG, after which the patient presented with shortness of breath and wheezing. [8] Furthermore, a case of a pacing wire found in the pulmonary artery, identified 30 days post coronary vessel and left ventricle repair, was reported by Tedoriya *et al.* [9] The wire was seen coincidentally on a post-operative follow-up CT chest. [7] There was even a rare case of migration of the epicardial pacing wire to the jaw reported by Kondo *et al.* [10]

4. Conclusion

The benefits of epicardial pacing wires are recognized, hence their widespread use during cardiac surgery. Nonetheless, there is an increasing number of cases reporting the migration of these wires to important structures, with a combination of unknown and documented serious outcomes. Percutaneous removal of intravascular foreign bodies is largely reported as safe. It is, however, important that the risk of retention of these wires should be a risk emphasized to patients and their surgeons, and the reasons and implications of this happening should be explored.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Batra, A. and Balaji, S. (2008) Post Operative Temporary Epicardial Pacing: When, How and Why? *Annals of Pediatric Cardiology*, **1**, 120. https://doi.org/10.4103/0974-2069.43877

[2] Korompai, F.L., Hayward, R.H. and Knight, W.L. (1987) Migration of Temporary Epicardial Pacer Wire Fragment Retained after a Cardiac Operation. *The Journal of Thoracic and Cardiovascular Surgery*, **94**, 446-447. https://doi.org/10.1016/s0022-5223(19)36262-2

[3] Shaikhrezai, K., Khorsandi, M., Patronis, M. and Prasad, S. (2012) Is It Safe to Cut Pacing Wires Flush with the Skin Instead of Removing Them? *Interactive Cardio-Vascular and Thoracic Surgery*, **15**, 1047-1051. https://doi.org/10.1093/icvts/ivs397

[4] Schechter, M.A., O'Brien, P.J. and Cox, M.W. (2013) Retrieval of Iatrogenic Intravascular Foreign Bodies. *Journal of Vascular Surgery*, **57**, 276-281. https://doi.org/10.1016/j.jvs.2012.09.002

[5] Gabelmann, A., Kramer, S. and Gorich, J. (2001) Percutaneous Retrieval of Lost or Misplaced Intravascular Objects. *American Journal of Roentgenology*, **176**, 1509-1513. https://doi.org/10.2214/ajr.176.6.1761509

[6] Meier, D.J., Tamirisa, K.P. and Eitzman, D.T. (2004) Ventricular Tachycardia Associated with Transmyocardial Migration of an Epicardial Pacing Wire. *The Annals of Thoracic Surgery*, **77**, 1077-1079. https://doi.org/10.1016/s0003-4975(03)01141-x

[7] Juchem, G., Golczyk, K., Kopf, C., Reichart, B. and Lamm, P. (2008) Bizarre Case of Migration of a Retained Epicardial Pacing Wire. *Europace*, **10**, 1348-1349. https://doi.org/10.1093/europace/eun269

[8] Worth, P.J., Conklin, P., Prince, E. and Singh, A.K. (2011) Migration of Retained Right Ventricular Epicardial Pacing Wire into the Pulmonary Artery: A Rare Complication after Heart Surgery. *The Journal of Thoracic and Cardiovascular Surgery*, **142**, e136-e138. https://doi.org/10.1016/j.jtcvs.2010.05.058

[9] Tedoriya, T., Kamiya, K., Okano, R., Gatate, Y., Miyauchi, T. and Fukuzumi, M. (2018) Migration of a Temporary Epicardial Pacing Wire to the Main Pulmonary Artery Trunk during the Acute Phase after Cardiac Surgery. *Journal of Surgery*, **11**, 1-3.

[10] Kondo, T., Hirota, M., Hoshino, J., Takahashi, Y., Notomi, Y. and Isomura, T. (2014) Temporary Epicardial Pacing Wire Migrating to and Exiting from the Jaw. *The Annals of Thoracic Surgery*, **98**, 2221-2223. https://doi.org/10.1016/j.athoracsur.2014.02.055