J Anesth (2013) 27:147–148
DOI 10.1007/s00540-012-1475-6

LETTER TO THE EDITOR

Subtotal intracardiac fragmentation of a pulmonary artery catheter during cardiac surgery: a rare complication of bipolar atrial ablation

Constantin J. C. Trepte · Sebastian A. Haas · Matthias S. Goepfert · Florian M. Wagner · Daniel A. Reuter

Received: 11 July 2012 / Accepted: 14 August 2012 / Published online: 6 September 2012
© Japanese Society of Anesthesiologists 2012

To the Editor:

A 67-year-old female patient with the diagnosis of an aortic and mitral valve stenosis and chronic atrial fibrillation underwent valve replacement and bi-atrial high-frequency bipolar ablation. For hemodynamic monitoring a pulmonary artery catheter (PAC) (7F, Intra Special Catheters, Rehlingen, Germany) was inserted via the right-sided internal jugular vein without any difficulty.

The operative course and establishment of cardiopulmonary bypass were uneventful. Before cardioplegic arrest, bipolar high-frequency ablation (Isolator Synergy™ Access, AtriCure®, West Chester, OH, USA) was carried out for bilateral isolation of the pulmonary veins. After cardiac arrest, further lesions included isolation of the left atrial appendage, completion of the box lesion to isolate the posterior left atrial wall, and completion of the left atrial isthmus lesion from the right lower pulmonary vein to the mitral annulus. After the completion of valve replacement and closure of the left atrium the heart was reperfused. Through 2 small incisions on the right atrial free wall and appendage, the ablation was completed into a full Cox-maze-III lesion set again using the bipolar device by the endoatrial insertion of one of two arms of the isolator clamp. During the entire procedure the PAC remained in its original position, in agreement with the surgeon. With weaning from cardiopulmonary bypass, surprisingly, matching of the central venous and pulmonary artery pressure signal was observed.

The first assumption was that a dislocation of the PAC had occurred, and that the PAC needed re-positioning after the termination of cardiopulmonary bypass and de-cannulation. When retracting the PAC, multiple subtotal transections of the polyurethane coating with opening of the catheter's lumens were found, explaining the conductance of the central venous pressure signal simultaneously via both the proximal and the distal lumen of the catheter. Continuity of the single fragments was maintained by the metal thermofilament of the catheter (Fig. 1). Only this thermofilament secured the retraction and complete recovery of the PAC. It has to be assumed that the damaging of the PAC happened by entrapment in the isolator clamps during the right atrial ablation. The further course was uneventful and the patient was transferred to the intensive care unit (ICU) in a stable condition.

The conduct of atrial high-frequency ablation during cardiac surgery and the use of a PAC are both well established [1–3]. Potential complications of atrial ablation include, especially, stenosis of the pulmonary veins or injury of the neighboring coronary arteries [4]. Also, various complications have been described consistent with the use of a PAC, such as cardiac arrhythmias, injury of the tricuspid or pulmonary valve, and infection [5]. To our knowledge, this is the first description of atrial high-frequency bipolar ablation associated with a nearly fatal damage of the PAC. Fortunately, in our patient the PAC was recovered in total. However, there is a potential danger that parts of the PAC may be dissected and might be washed into the pulmonary circulation, leading to potential embolization requiring further surgical intervention.

C. J. C. Trepte · S. A. Haas (✉) · M. S. Goepfert · D. A. Reuter
Center for Anaesthesiology and Intensive Care Medicine, University Medical Center Hamburg-Eppendorf, Martinistrasse 52, 20246 Hamburg, Germany
e-mail: shaas@uke.de

F. M. Wagner
Department of Cardiovascular Surgery, University Heart Center, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

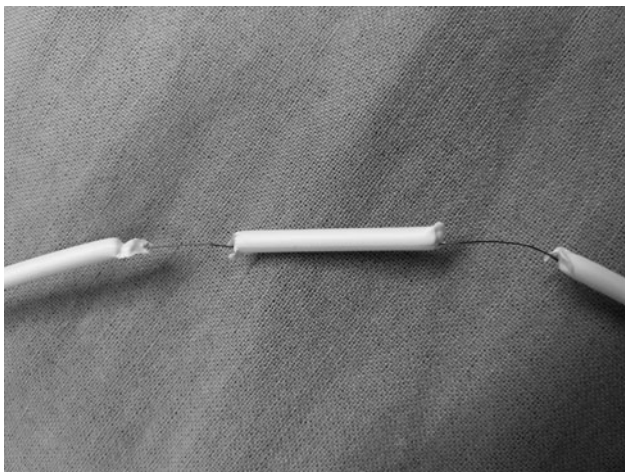

Fig. 1 Fragmented pulmonary artery catheter with continuity upheld only by the thermofilament wire

Therefore, in conclusion, we consider it important, that during bipolar high-frequency atrial ablation, the PAC needs to be retracted. It should be communicated to the surgeon that a special focus is necessary to ensure that the PAC is not affected by the isolator clamps.

Conflict of interest None.

References

1. Ruchat P, Schlaepfer J, Delabays A, Hurni M, Milne J, Von Segesser LK. Left atrial radiofrequency compartmentalization for chronic atrial fibrillation during heart surgery. Thorac Cardiovasc Surg. 2002;50:155–9.
2. Greenberg SB, Murphy GS, Vender JS. Current use of the pulmonary artery catheter. Curr Opin Crit Care. 2009;15:249–53.
3. Ranucci M. Which cardiac surgical patients can benefit from placement of a pulmonary artery catheter? Crit Care. 2006; 10(Suppl 3):S6.
4. Mokadam NA, McCarthy PM, Gillinov AM, Ryan WH, Moon MR, Mack MJ, Gaynor SL, Prasad SM, Wickline SA, Bailey MS, Damiano NR, Ishii Y, Schuessler RB, Damiano RJ Jr. A prospective multicenter trial of bipolar radiofrequency ablation for atrial fibrillation: early results. Ann Thorac Surg. 2004;78: 1665–70.
5. Pinsky MR, Vincent JL. Let us use the pulmonary artery catheter correctly and only when we need it. Crit Care Med. 2005;33: 1119–22.