Clin Res Cardiol 97:628–629 (2008)
DOI 10.1007/s00392-008-0677-2

Rainer Grove
Wolfgang Kranig
Ruud Coppoolse
Guido Lüdorff
Endrik Wolff
Henning Warnecke
Joachim Thale

Demand for open heart surgery due to entrapment of a circular mapping catheter in the mitral valve in a patient undergoing atrial fibrillation ablation

Introduction

Sirs: Catheter ablation has become an established method in patients with paroxysmal or chronic atrial fibrillation refractory to drug treatment. In most patients the ablation procedure comprises pulmonary vein isolation. Several complications like thromboembolic events, pulmonary vein stenosis, fistula between left atrium and esophageus and pericardial tamponade are to be feared. The overall rate of severe procedural complications may exceed 3% [1, 2].

Case presentation

A 40-year-old man had suffered from paroxysmal atrial fibrillation for 5 years. There was no evidence for structural heart disease. In the past pharmacological antiarrhythmic therapy had been carried out with betablockers, flecainide and amiodarone. As the patient remained highly symptomatic he was accepted for an interventional therapy.

Received: 15 February 2008
Accepted: 15 May 2008
Published online: 16 July 2008

R. Grove, MD (✉) · W. Kranig
R. Coppoolse · G. Lüdorff
E. Wolff · H. Warnecke · J. Thale
Schüchtermann-Klinik
Ulmenallee II
49214 Bad Rothenfelde, Germany
E-Mail: rgrove@schuechtermann-klinik.de

CRC 677

For ablation both femoral veins were punctured followed by placement of standard electrophysiological catheters in the coronary sinus and in a HIS position. Afterwards the interatrial septum was punctured twice, two 8.5F sheaths (SJM Daig SL1, Minnetonka, MN, USA) were placed in the left atrium and a circular mapping catheter (20 mm diameter Lasso, Biosense Webster, Diamond Bar, CA, USA) and an irrigated tip ablation catheter (Therapy Cool Path, SJM, Minnetonka, MN, USA) were brought forward to the left atrium. The Lasso-catheter was then placed in the ostium of the left upper pulmonary vein followed by a circumferential ablation. The same was done for the right upper and right lower pulmonary vein. After complete isolation of these three pulmonary veins the Lasso catheter should have been positioned in the ostium of the left lower pulmonary vein. During catheter movement in the left atrium the Lasso catheter entrapped in the mitral valve apparatus. Careful manipulations of the catheter back and forth and clockwise rotation could not release the catheter from the mitral valve. In order to avoid a severe valve damage a transesophageal echocardiogram (TEE) was performed. Under control of TEE more intensive catheter manipulations were applied. It was noticeable that no mitral valve insufficiency occurred. Applying more force to the catheter led to its demolition with the peripheral end between mitral valve and transseptal sheath (Fig. 1). Additional manoevers to bring the catheter fragment out with extraction devices also failed. Thus the patient was referred to the cardiac surgery departement. During open heart surgery a severe fixation of the catheter fragment in the mitral valve apparatus occurred (Fig. 2). Removal of the whole fragment was only possible in several compo-

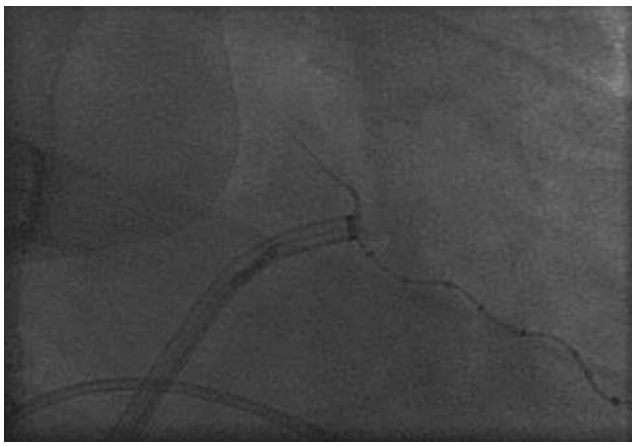

Fig. 1 RAO 30° projection showing the Lasso catheter fragment between mitral valve and trannseptal sheath

Fig. 2 Intraoperative view from the patients right side; transseptal sheath and fragment of the Lasso catheter in and near the mitral valve

nents (Fig. 3). Additionally tendinous cords of the posterior papillary muscle turned out to be ruptured. The damage of the mitral valve made a valve reconstruction by reinsertion of the tendinous cords and

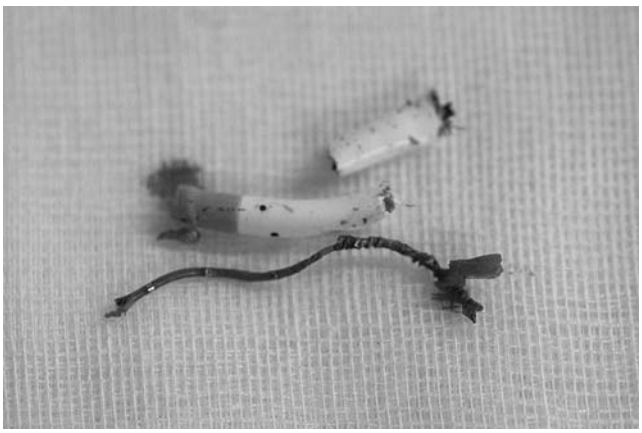

Fig. 3 Fragments of the Lasso catheter

implantation of a ring necessary. In addition to the valve recontruction the ablation could be completed intraoperatively. The postoperative course of the patient was free of complications. The reconstructed mitral valve showed no incompetence at the patients hospital discharge.

Conclusion

Our case report demonstrates a rare complication [3, 4] of atrial fibrillation ablation. Due to the proximity of the left inferior pulmonary vein to the mitral valve a catheter dislodgement is possible, the anatomy of the valve hold apparatus and the construction of the electrophysiological catheter can lead to a catheter entrapment in valve structures. A small bulge at the end of the Lasso catheter may have enhanced its fixation.

From the described experience we recommend open heart surgery to bring out catheter fragments thus enabling valve repair and completion of the ablation as well.

References

1. Bertaglia E, Zoppo F, Tondo C, et al. (2007) Early complications of pulmonary vein catheter ablation for atrial fibrillation: a multicenter prospective registry on procedural safety. Heart Rhythm 4:1265–1271
2. Cappato R, Calkins H, Chen SA, et al. (2005) Worldwide survey on the methods, efficacy and safety of catheter ablation for human atrial fibrillation. Circulation 111:1100–1105
3. Kesek M, Englund A, Jensen SM (2007) Entrapment of circular mapping catheter in the mitral valve. Heart Rhythm 4:17–19
4. Wu RC, Brinker JA, Yhu DD, et al. (2002) Circular mapping catheter entrapment in the mitral valve apparatus: a previously unrecognized complication of focal atrial fibrillation ablation. J Cardiovasc Electrophysiol 13:819–821