



Iatrogenic Tamponade Induced by Torn Catheter Sheath

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Abstract

A 64-year-old man underwent ablation for atrioventricular node reentry tachycardia. After 1 month, he presented to the emergency room with increasing dyspnea, chest pain, and shock secondary to cardiac tamponade. Contrast-enhanced computed tomography showed a foreign body in the right ventricle, with significant pericardial effusions. He underwent emergency cardiac surgery for removing the foreign body. It was identified as a torn catheter sheath.

Key words: *Iatrogenic, cardiac tamponade, complication, ablation*

Introduction

The mechanical complication after the catheter maneuver has been reported in the literature [1-4]. Pulmonary artery injury, superior vena caval injury and right ventricular perforation have been reported. This article presents an occurrence of delayed tamponade that developed 1 month after ablation.

Case report

A 64-year-old man was brought to the emergency department for increasing dyspnea, chest pain, and shock. He had a history of palpitations since he was 15 years old. He underwent ablation for atrioventricular node reentry tachycardia 1 month before entry into a local hospital. The post-treatment course was uneventful, and his

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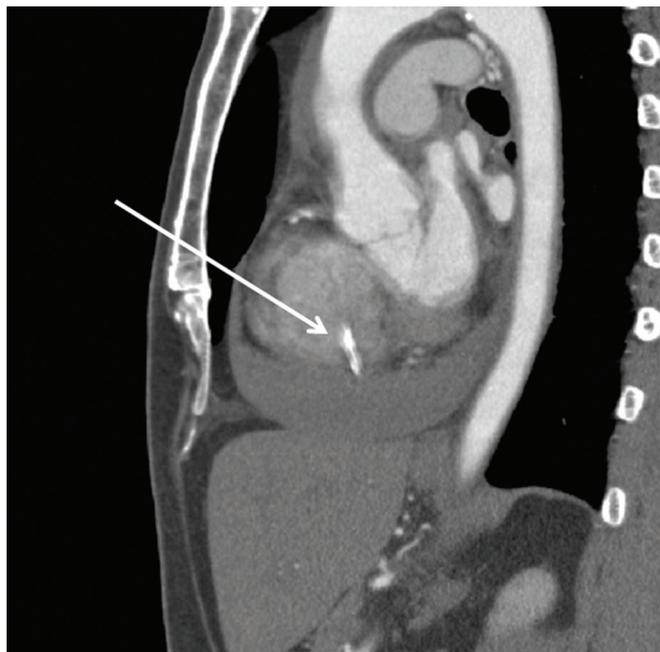


Figure 1. Sagittal view of contrast-enhanced computed tomography demonstrating linear opacity (arrow). The lower end of linear opacity appeared to be penetrating the right ventricular wall.

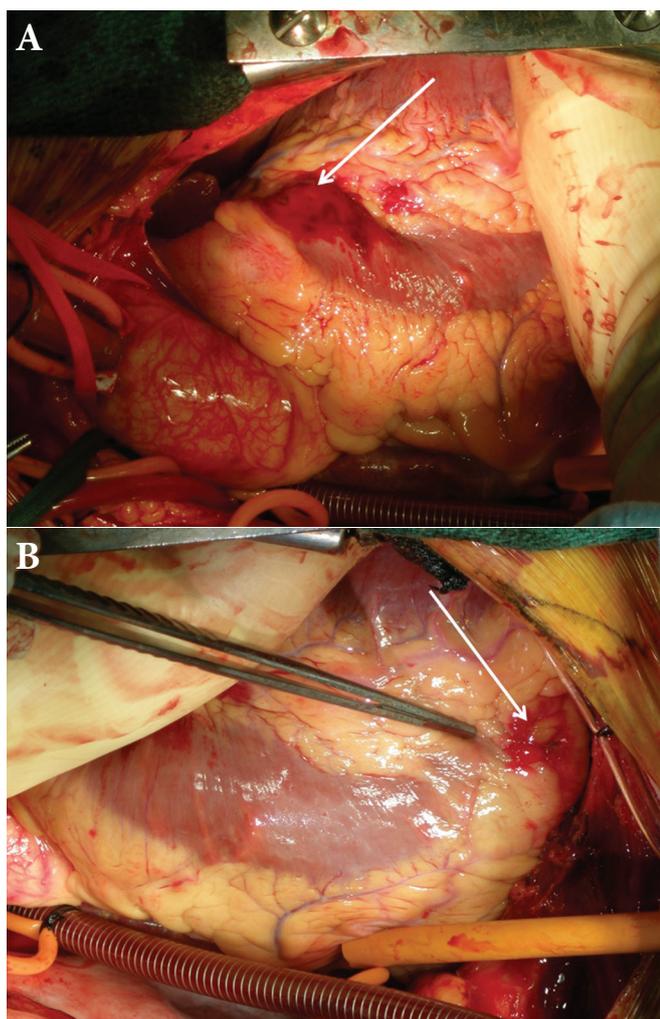


Figure 2. **A)** A small laceration (arrow) in the main pulmonary artery that was not currently bleeding. **B)** A small laceration (arrow) in the right ventricular wall that was not currently bleeding.

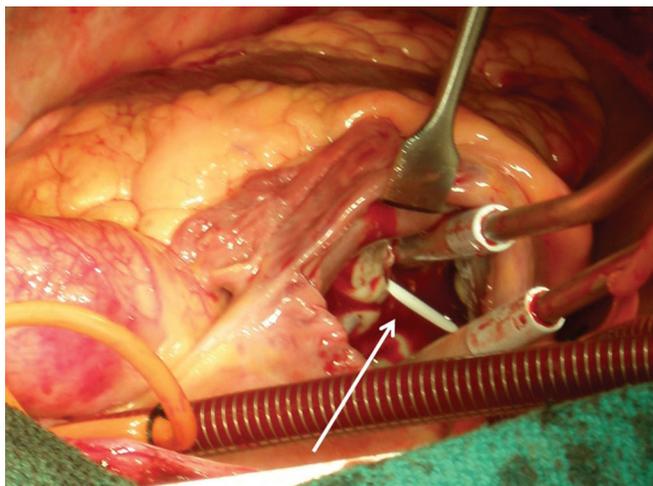


Figure 3. A torn catheter sheath (arrow) in the right ventricle.

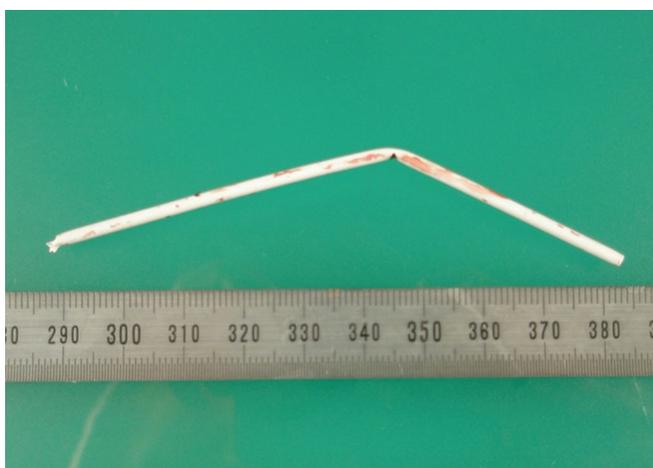


Figure 4. Pathologic image of removed torn catheter sheath.

symptom had improved at discharge. At presentation, the patient was alert and in distress. The pulse was 80 beats/min, blood pressure was 64/43 mm Hg, and his temperature was 35.6°C. Physical examination was notable for cyanosis, diaphoresis, cold clammy skin and jugular venous distention. Echocardiography revealed significant pericardial effusions with diastolic collapse of the right atrium. Contrast-enhanced computed tomography (Figure 1) revealed no aortic dissection and a linear opacity in the pulmonary artery originating in the right ventricle and terminating in a proximal of the main pulmonary artery. The linear opacity did not appear to be causing disruption of flow nor thrombosis. However, the lower end of linear opacity appeared to be penetrating the right ventricular wall. 350ml drainage of pericardial effusion by pericardiocentesis and aggressive fluid replacement stabilized blood pressure to 130/80 mm Hg. Because of the concern of cardiac tamponade and further migration, we selected to remove

the foreign body.

The operation was performed through a median sternotomy with the use of cardiopulmonary bypass with moderate systemic hypothermia (28–30°C). After draining dark red blood and a clot surrounding the heart, exploration around the heart revealed a small laceration in the main pulmonary artery and right ventricular wall that was not currently bleeding (Figure 2a,b). After a right atrium incision, a torn catheter sheath was detected and carefully removed (Figure 3,4). A sheeted biological tissue adhesive was placed to repair the laceration. The patient was transferred to the surgical intensive care unit and the postoperative course was uneventful. He discharged 9 days after surgery. At the 20-month follow-up, the patient was in good health.

Discussion

Some previous cases have reported the cardiac tamponade with right ventricular perforation after pacemaker placement [1,2], pulmonary artery perforation after pulmonary angiography [3] and superior vena cava perforation after central venous interventions [4]. The cause of this patient's perforations was undoubtedly the torn catheter sheath penetrating the right ventricle and pulmonary artery. The major factor governing the perforation of tissue by a catheter sheath appears to be the stiffness of the material. Although it is not clear when the catheter sheath became lodged in the right ventricle and pulmonary artery in this case, acute cardiac tamponade caused by a torn catheter sheath 1 month after ablation is a comparatively rare case. An appropriate combination of pericardiocent-

esis, drain placement, aggressive fluid replacement, blood transfusion and snaring of the foreign body with a catheter might treat acute cardiac tamponade in this case; however, prompt and certain multidisciplinary with a thoracotomy procedure was needed to save the patient with this type of initial presentation.

Conclusion

Migration of a torn catheter sheath is a well-established yet rare complication of ablation. We described the delayed tamponade associated with a torn catheter sheath. It is essential to avoid leaving a foreign body after a catheter procedure.

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Conflict of interest statement

The authors have no conflicts of interest to declare.

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