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Case Report

Iatrogenic acute type A aortic dissection during catheter ablation for idiopathic ventricular premature contraction

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Abstract

Acute aortic dissection type A during cardiac catheterization has been reported as a rare but fatal complication. We present a case of acute aortic dissection type A occurring during catheter manipulation in the ascending aorta during mapping of ventricular premature contraction via the retrograde approach. In the present case, transthoracic echocardiography showed no pericardial effusion and no flap of the aorta, but intracardiac echo clearly showed the flap. Enhanced computed tomography revealed the aortic dissection, which extended from the ascending aorta to the bilateral common iliac artery, and the false lumen was thrombosed completely. Emergent surgery was performed and the postoperative course was uneventful, and he was discharged with no complications. Aortic dissection is a rare complication of cardiac catheterization, and early detection could prevent a fatal outcome. It is important to detect the signs and symptoms as quickly as possible and perform various diagnostic examinations.

Keywords: acute aortic dissection; catheter ablation

Introduction

Acute aortic dissection type A (AADA) during cardiac catheterization has been reported as a rare but fatal complication, with a few cases occurring during catheter ablation. We present a case of AADA occurring during catheter manipulation in the ascending aorta during mapping of ventricular premature contraction (VPC) via the retrograde approach.

Case report

A 65-year-old male presented with intermittent chest discomfort. He had a medical history of hypertension, dyslipidemia, and cerebral infarction without sequelae. Preoperatively performed echocardiography and coronary angiography showed no underlying structural heart disease. Twenty-four-hour-Holter electrocardiography showed 13% single VPCs, which explained his cardiac discomfort. He refused medical therapy and was thus referred for catheter ablation for VPCs. In the morphology of the electrocardiogram of VPC (Fig. 1), large R waves were observed in the inferior leads (II, III, aVF), and an R or Rs pattern was demonstrated in the precordial leads V_3 to V_6. Deep S waves were demonstrated in lead V_2. These findings indicate that the VPCs originated from the left ventricular outflow tract (LVOT).

After placing 2 sheaths each in the right femoral vein and artery, and 1 sheath in the left subclavian vein, a 10-polar straight deflectable mapping catheter "DECANAV" (Biosense Webster, Yokneam Illit, Israel) was advanced into the right ventricle outflow tract (RVOT). An activation map and pace map under 3D anatomical mapping using the CARTO system (Biosense Webster) indicated that the origin was not in the RVOT. Before placing the DECANAV catheter in the aorta, the geometry around the aortic valve cusps and LVOT were created using CARTO SOUND (Biosense Webster). During the manipulation of mapping in the aorta via the retrograde approach, the patient complained of pain, which occurred in the chest and moved to the back. It happened before delivering any radiofrequency applications. Coronary angiography was performed and revealed normal findings. Transthoracic echocardiography showed no pericardial effusion. Intracardiac echo CARTO SOUND demonstrated the presence of aortic dissection. The catheter procedure was stopped. Enhanced computed tomography (eCT) revealed AADA, which extended from the ascending aorta to the bilateral common iliac artery, and the false lumen was thrombosed completely (Fig. 2). Emergent surgery was performed. A tear of the intima was confirmed at a slight cranial sinotubular junction on the right coronary cusp side of the ascending aorta (Fig. 3), but the coronary arteries were intact. Thus, ascending aortic replacement was performed. The postoperative course was uneventful, and he was discharged with no complications after 3 weeks.

Discussion

Iatrogenic aortic dissection is a rare complication of cardiac procedures, with an incidence of 0.06% for open surgery and 0.01% for cardiac catheterization [1], as well as a mortality rate of 35% [2]. In this case, AADA occurred during the manipulation of the mapping

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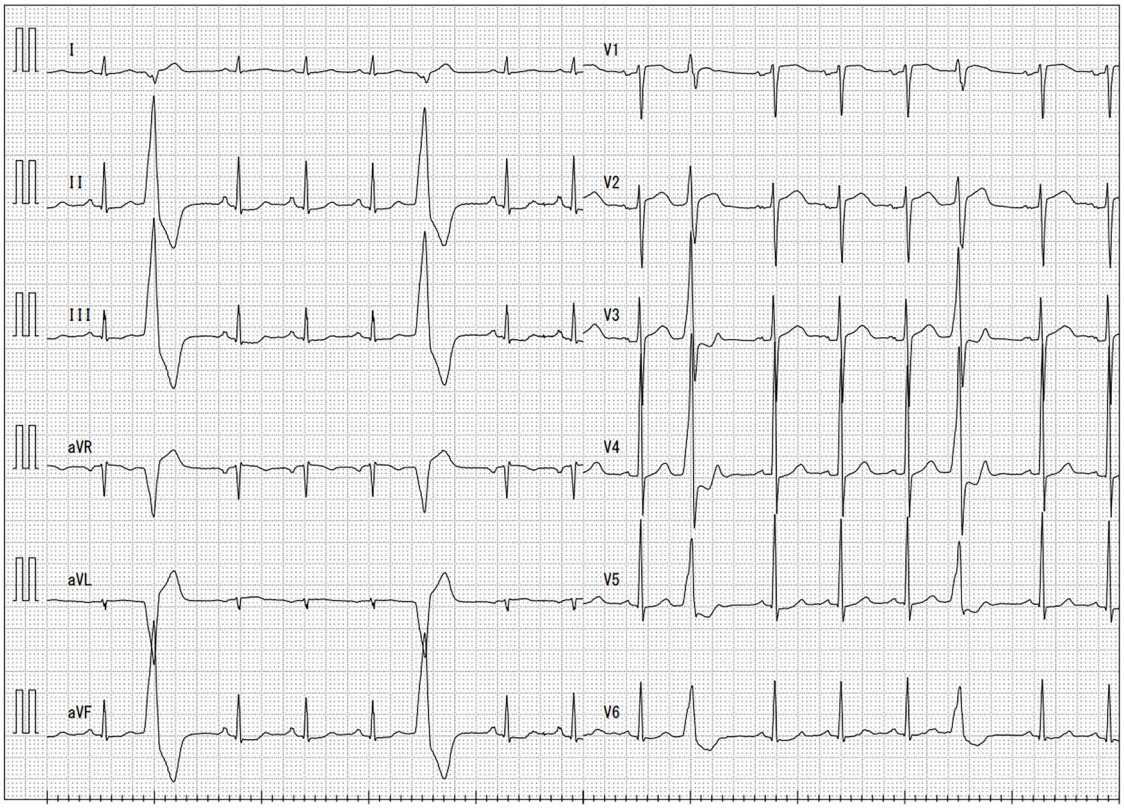

Figure 1. Electrocardiogram before catheter ablation.

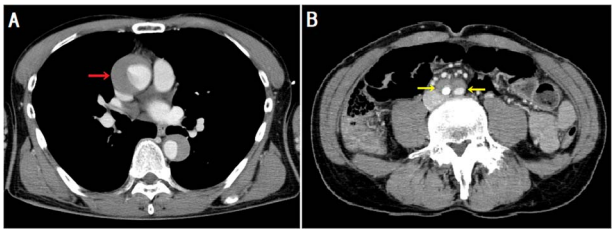

Figure 2. Enhanced computed tomography showing a type A aortic dissection. The dissection extended from the ascending aorta (**A**, arrow) to the bilateral common iliac artery (**B**, arrows). The false lumen was completely thrombosed.

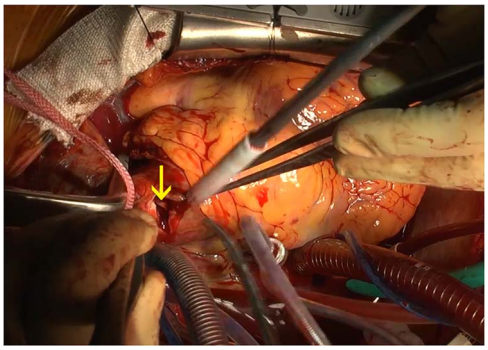

Figure 3. Intraoperative images obtained from the surgeon's perspective. A tear of the intima was confirmed at a slight cranial sinotubular junction on the right coronary cusp side of the ascending aorta (arrow).

catheter. It was likely precipitated by mechanical injury to the intima of the ascending aorta, which was repaired by emergent surgery. The preoperative hemodynamics were relatively stable despite the presence of AADA, which may be explained by the situation that the false lumen of the aorta was occluded due to the thrombus formation. The past few reports describing aortic dissection during catheter ablation also indicate an occlusion of the false lumen [3–5]. Aortic dissection is difficult to diagnose compared to apparent complications such as cardiac perforation. In the present case, transthoracic echocardiography showed no pericardial effusion and no flap of the aorta, but intracardiac echo clearly showed the flap, which was confirmed by eCT, thus leading to management with cardiac surgery.

In conclusion, aortic dissection is a rare complication of cardiac catheterization, and early detection could prevent a fatal outcome. It is important to detect the signs and symptoms as quickly as possible and perform various diagnostic examinations.

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Conflict of interest

We have no conflict of interest to declare.

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Ethical approval

No ethical approval is required for case report in our institusion.

Content

Informed consent for publication of their details was obtained from the patient.

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