

## Aortocoronary Dissection Complicated With Percutaneous Coronary Intervention: A Case Report

Kazuyuki OZAKI, MD\*<sup>1</sup>  
Takaaki KUBO, MD\*<sup>2</sup>  
Etsuji SAJI, MD\*<sup>2</sup>  
Keita OHTAKI, MD\*<sup>2</sup>  
Hidehira FUKAYA, MD\*<sup>2</sup>  
Yoshifusa AIZAWA, MD, FJCC

### Abstract

A 74-year-old female developed aortocoronary dissection during percutaneous coronary intervention. The forceful manipulation of the guide catheter and contrast medium injection seemed to be the cause of the aortocoronary dissection involving the coronary sinus of Valsalva. The entry of the dissection was closed with subsequent obliteration of the false lumen by coronary stenting under the guidance of intracoronary ultrasonography and angiography.

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### Key Words

- Aortic diseases (coronary sinus of Valsalva)
- Contrast media
- Interventional cardiology

### INTRODUCTION

Coronary artery dissection is a well-recognized complication of coronary angiography and percutaneous coronary intervention (PCI)<sup>1</sup>. However, aortocoronary dissection is rare and a few cases have been reported<sup>2-7</sup>. The incidence of aortocoronary dissection is < 0.01 - 0.02% for diagnostic cardiac catheterization and 0.02 - 0.15% for PCI procedures<sup>2,4,6</sup>. Aortocoronary dissection usually results from coronary dissection which extends retrogradely and involves the coronary sinus of Valsalva. We report a case of a coronary dissection extending into the coronary sinus of Valsalva as a complication of PCI.

### CASE REPORT

A 74-year-old female was admitted for recurrent

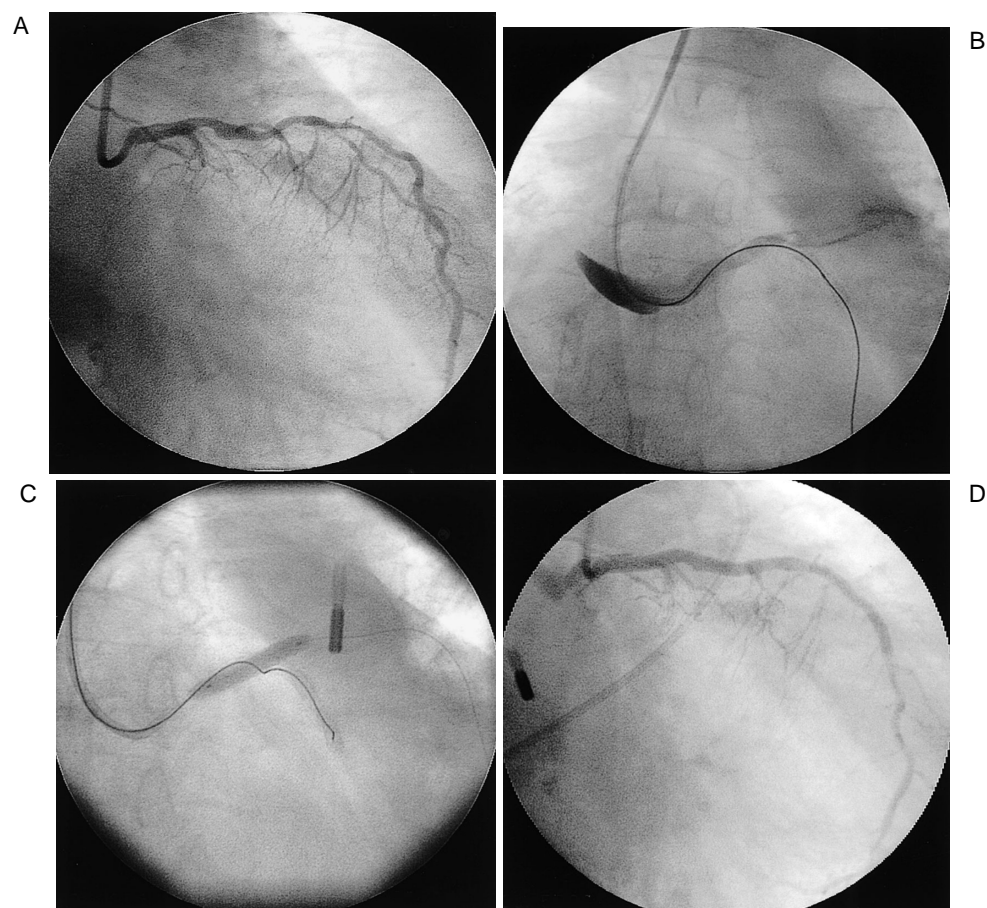
inferior acute myocardial infarction. Four years ago, she had inferior myocardial infarction and had undergone PCI. Stents were implanted to the mid-portion of the right coronary artery (RCA) and mid-portion of the left circumflex artery (LCX). This time, emergent coronary angiography revealed total occlusion of the proximal RCA and in-stent total occlusion of the mid-LCX (Fig. 1 - A). The left anterior descending artery (LAD) supplied collateral flow to the area distal to the occluded RCA and LCX. Direct PCI of the culprit lesion of the RCA was performed and recanalization of the RCA was attained. Peak creatine kinase was 1,150 IU/l. Transthoracic echocardiography revealed inferior asynergy and ejection fraction of 40%. The lateral wall motion was preserved and the lateral wall was thought to be viable. Therefore, we decided to perform PCI for in-stent total occlusion of the mid-

新潟大学大学院医歯学総合研究科 循環器学分野: 〒951-8510 新潟県新潟市旭町通1-757; \* (現在) \*<sup>2</sup>竹田総合病院 循環器科: 〒965-8585 福島県会津若松市山鹿町3-27

Division of Cardiology, Niigata University Graduate School of Medical & Dental Sciences, Niigata; \* (present) \*<sup>2</sup>Division of Cardiology, Takeda General Hospital, Fukushima

**Address for correspondence:** OZAKI K, MD, Division of Cardiology, Niigata University Graduate School of Medical & Dental Sciences, Asahimachi 1 - 757, Niigata, Niigata 951 - 8510; E-mail: k-ozaki@med.niigata-u.ac.jp

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**Fig. 1** Left coronary angiograms

A: In-stent total occlusion of the left circumflex artery.

B: Aortic-coronary dissection is clearly shown by contrast medium at the coronary sinus of Valsalva, left main coronary artery and proximal left anterior descending artery.

C: Stenting to close the entry.

D: After stenting.

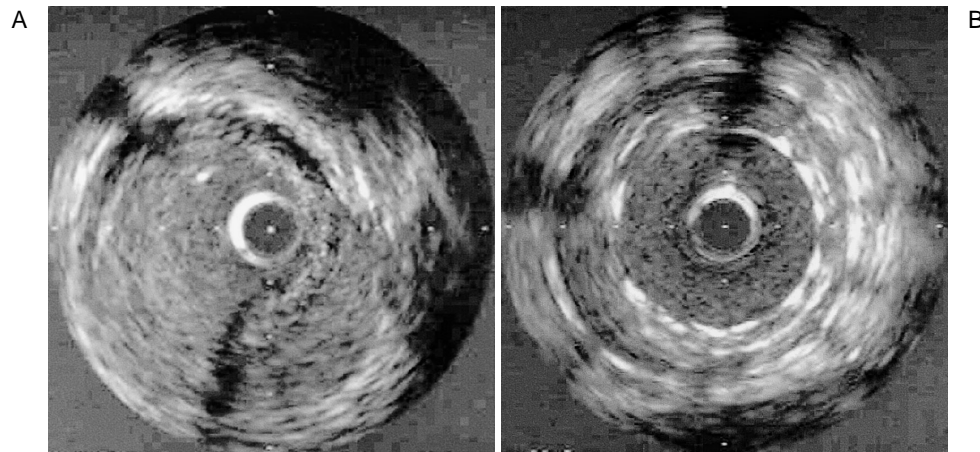
LCX. After eleven days of cardiac rehabilitation, PCI of the LCX lesion was planned.

The catheter was inserted from the right radial artery. The Ikari-left 3.5 6F catheter was engaged in the ostium of the left coronary artery and a guidewire was crossed through the in-stent occlusion of the LCX. Because the in-stent occlusion was very hard and required some force to cross the guidewire, the tip of the guide catheter was advanced into the left main coronary artery (LMCA). Then, the contrast medium was injected.

Immediately after the injection, the patient complained of pain in the anterior chest and back. Electrocardiography documented ST-segment elevation in the precordial leads. Coronary angiography revealed a large dissection starting from the site of contact of the tip of the guide catheter. The

dissection extended to the coronary sinus of Valsalva proximally and to the mid-portion of LAD distally (Fig. 1 - B). Her blood pressure fell and intra-aortic balloon pump support was inserted immediately to stabilize the hemodynamics. Intracoronary ultrasound (ICUS) showed a large dissection in the proximal LMCA extending to the LAD and coronary sinus of Valsalva (Fig. 2 - A). A stent was implanted in the LMCA lesion. Blood flow in the LAD recovered after implantation of five stents.

After the stenting, coronary angiography showed reduced false lumen and the patent LAD (Fig. 1 - D). ICUS revealed that the stents were well dilated with less false lumen (Fig. 2 - B). Computed tomography immediately after the PCI showed a dissection of the coronary sinus of Valsalva with



**Fig. 2 Intracoronary ultrasound findings**

A: At the entry point of dissection in the left main coronary artery.

B: Stent is covering the dissected flap at the entry.

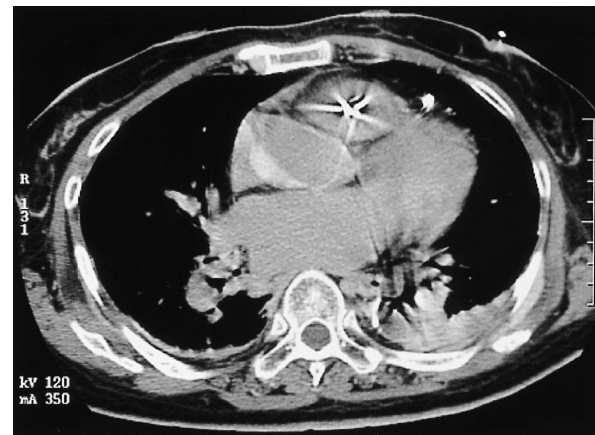
contrast medium pooling (Fig. 3). The patient had no complaints after stenting and was discharged 18 days later. The clinical course was uneventful. Four months later, follow-up coronary angiography showed no significant stenosis in the LMCA and LAD and computed tomography detected no dissection of the coronary sinus of Valsalva.

### DISCUSSION

If the aortocoronary dissection is limited in the aortic sinus of Valsalva, it will resolve spontaneously<sup>5</sup>, whereas aortic dissection extending more than 40 mm up the aorta from the coronary ostium is thought to require surgical intervention<sup>6</sup>. In this case, stent implantation was used to close the entry point of the aortocoronary dissection as previously described<sup>4,6,7</sup>.

ICUS control is useful to implant stents for aortocoronary dissection<sup>7</sup>. ICUS showed the details of the aortocoronary dissection in our case, including the position of the entry point and the size of the dissected vessel. We could implant stents appropriately to secure the dissected layer and diminish blood flow into the false lumen.

In the present case, the trigger for the aortocoronary dissection was thought to be direct catheter trauma caused by forceful manipulation of the guide catheter and forceful contrast medium injection into the subintimal space using a power injector. The use of guide catheters for PCI procedures may become a cause of catheter complications. However, only catheter trauma seemed unlikely to



**Fig. 3 Computer tomogram after the percutaneous coronary intervention showing the dissection of the coronary sinus of Valsalva with contrast medium pooling**

cause the aortocoronary dissection because the dissections developed after the contrast medium injection. Such a mechanism has already been reported<sup>2,4,5</sup>. We performed PCI using a power injector in this case. Excessively powerful contrast medium injection may be a precipitating cause of aortocoronary dissection. Power injection of contrast medium is used to provide optimal visualization of the coronary artery and is usually safe<sup>8,9</sup>. Although injection into the subintimal layer is rare, we need more attention to optimize the position of the guide catheter during PCI using a power injector.

## 要 約

## 経皮的冠動脈形成術施行中に生じた大動脈冠動脈解離の1例

尾 和幸 久保 貴昭 佐治 越爾  
大瀧 啓太 深谷 英平 相澤 義房

症例は、経皮的冠動脈形成術施行中に生じた大動脈冠動脈解離の74歳、女性である。ガイドカテーテルの強い操作および造影剤の注入が、Valsalva洞まで到達した大動脈冠動脈解離の原因と考えられた。冠動脈内超音波および冠動脈造影の所見に基づき、冠動脈内へのステント留置により解離の入口部を閉鎖し、偽腔を縮小した。

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