

CASE REPORT

Aortic dissection as a rare complication of percutaneous coronary intervention

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SUMMARY

Aortic dissection is a rare but life-threatening complication that can occur during percutaneous coronary intervention procedures. We present a case of a 55-year-old woman who underwent a right coronary angioplasty that was complicated by a proximal dissection of the ascending aorta. Urgent surgical repair of the aorta was performed and the patient was discharged in stable clinical condition.

BACKGROUND

Coronary artery dissection is a recognised complication of coronary intervention. Most dissections are small, have a benign course and are detected by angiography in 20–40% of cases.¹

Aortic dissection is a life-threatening condition defined by separation of layers of the aortic wall. Acute dissection of aorta complicating a coronary intervention is a rare occurrence, with incidence reported as 0.02% of coronary angioplasties.² It is associated mostly with interventions of the right coronary artery (RCA)^{3–7} and occurs very rarely with interventions of the left coronary circulation.^{5 8 9} The appropriate management and outcome of these cases is not well established. Treatment options depend on patient stability, nature and extent of dissection, and ability to restore the coronary circulation by further interventions.^{5 7}

Here we report a case of 55-year-old woman who developed dissection of the ascending aorta during angioplasty of the right coronary artery, and who was treated with drug eluting stents and surgery.

CASE PRESENTATION

A 55-year-old Caucasian woman with a medical history of hypertension and hyperlipidaemia presented to us with recurrent episodes of substernal chest pain. The pain lasted about 5–10 min, worsened with exertional activities, radiated to the arms and was relieved with rest as well as by nitroglycerine. There was no history of palpitations, orthopnoea, fever, cough or shortness of breath. The patient was a former smoker and quit 6 years earlier.

On examination, the patient was alert, oriented and responsive. She had a regular heart rate of 64/min and a blood pressure of 118/78 mm Hg. The rest of the physical examination revealed no significant findings.

INVESTIGATIONS

ECG revealed inferolateral ischaemic changes. The patient was scheduled for a coronary angiography, which showed an acutely occluded RCA (figure 1).

During angiography, the RCA was wired across the area of total occlusion without difficulty, after engaging the artery with a 6-French guide. Angioplasty was performed in the proximal segment with a 2.0×12 mm balloon. While performing left ventriculography, aortic insufficiency was seen. Hence, a decision was made to perform aortography, which showed an echo-dense filling on the ascending aorta (figure 2). During this time, the patient denied any chest pain, shortness of breath or dizziness. However, she did have elevated blood pressure up to 192/105 mm Hg. The rest of the vital signs were as follows: afebrile, pulse rate of 75/min, respiratory rate of 21/min and oxygen saturation of 99% on room air. CT of the chest confirmed a proximal dissection of the ascending aorta (figure 3).

TREATMENT

Three drug-eluting stents were placed immediately in the RCA and urgent proximal aortic root repair was undertaken.

OUTCOME AND FOLLOW-UP

The postoperative course was uneventful. The patient was transferred out of the intensive care unit on the third postoperative day. The rest of the hospitalisation was also uneventful and she was sent home on the seventh postoperative day in stable clinical condition. Although a follow-up was recommended in 2 weeks following discharge at the outpatient clinic, the patient did not show up and has been lost to follow-up since then.

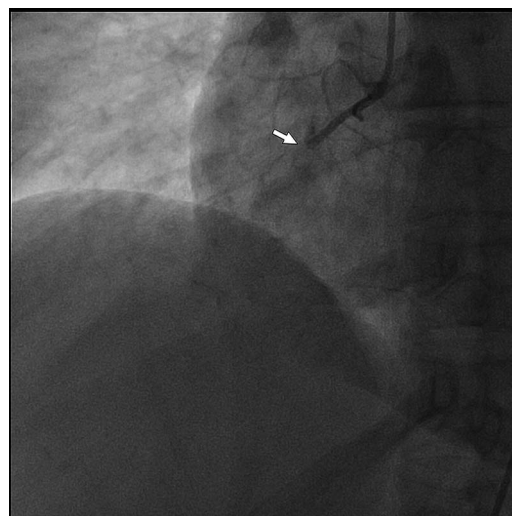


Figure 1 Coronary angiogram showing totally occluded proximal segment of the right coronary artery.



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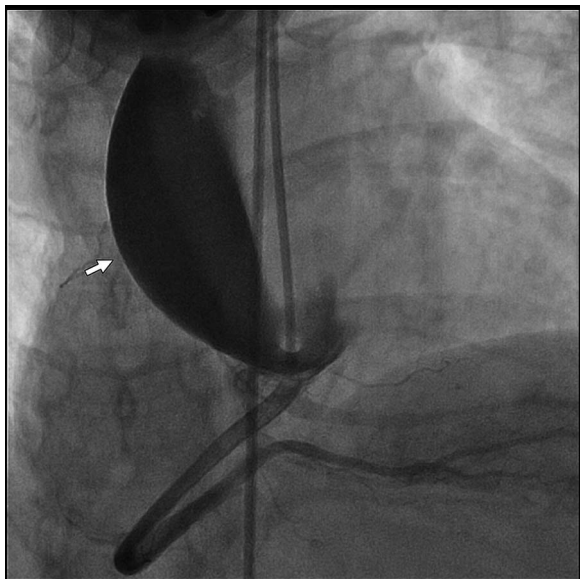


Figure 2 Post-stenting right coronary angiogram showing large iatrogenic aortic dissection that spans from the right coronary sinus to the aortic arch.

DISCUSSION

Aortic dissection is an extremely rare complication of coronary intervention. The origin of this dissection may be in the aortic root or coronary ostium.¹⁰ The precise mechanism remains unknown and it is suspected to occur due to forceful use of a catheter or guide wire, vigorous injection of dye or underlying degeneration of the aortic wall.^{8 11 12} Aortic dissection is more common during interventions of the RCA than left coronary artery and may be due to its comparatively thin wall, tortuous anatomy and small size.^{13 14}

Propagation of the aortic dissection may occur in an antero- or retrograde fashion leading to complications such as myocardial infarction, aortic valve insufficiency, haemopericardium or cardiac tamponade.¹⁵ Continuous monitoring for early recognition and prompt management of these complications is crucial.

Treatment should be tailored depending on clinical and haemodynamic stability of the patient. Conservative treatment is sufficient in cases limited to aortic sinus of Valsalva.¹⁶ Localised dissections can be managed with implantation of stents distal to the dissection and near the ostium, thus sealing the entry

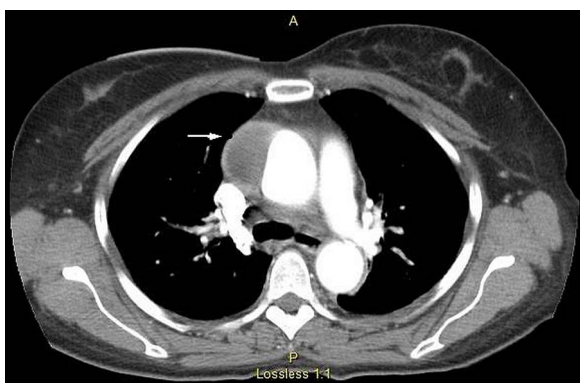


Figure 3 CT of the chest showing aortic dissection of the ascending aorta with false lumen (as shown by the arrow).

port.^{7 8} They can be followed up with ECG and CT scan after restoration of coronary blood flow by stenting.^{5 7} Surgery is the option if stenting fails, or if the patient is haemodynamically unstable or there is extensive dissection.^{2 4 7} In a review of nine cases by Dunning *et al*,² limited aortic involvements were successfully managed with stenting while dissections larger than 4 cm required surgical intervention. Emergency surgeries are associated with high risk because the patients are unstable. Moreover, aortic root replacement or replacement of the ascending aorta with coronary artery bypass grafting may have to be performed in an emergent situation, which increases the risk further.⁷

In our case, aortic root dissection was noted during coronary angioplasty and it propagated to involve the ascending aorta. Consequently, three drug-eluting stents were placed and the aortic dissection was corrected by surgery.

Learning points

- ▶ Aortic dissection, although rare compared to coronary artery dissection, can occur as a complication of coronary intervention.
- ▶ It may occur due to forceful use of a catheter or guide wire, vigorous injection of dye or underlying degeneration of the aortic wall. The right coronary artery is more commonly affected than left coronary artery due to its comparatively thin wall, tortuous anatomy and small size.
- ▶ Treatment depends on clinical and haemodynamic stability of the patient. Localised dissections may be managed conservatively. Other options are stenting and surgery, employed mainly in extensive dissection or unstable patients.

Contributors SG and PD wrote the first draft. IH gathered clinical information and imaging. SA supervised the project and critically reviewed the final draft.

Competing interests None.

Patient consent Obtained.

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