Unusual presentation of more common disease/injury

Trapdoor ischaemia: coronary ostial occlusion by an aortic dissection

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Summary

We present an interesting case of an elderly man with acute myocardial infarction due to retrograde dissection of the aortic root occluding the coronary ostia.

BACKGROUND

Acute myocardial infarction (AMI) is most commonly triggered by the disruption of an atherosclerotic plaque in an epicardial coronary artery. We present an interesting case where intraluminal pathology was not causal. Our case is that of an inferior ST-elevation myocardial infarction secondary to a functional right coronary artery (RCA) ostial occlusion from an ascending aortic (type A) dissection.

CASE PRESENTATION

Our patient is an elderly man with a history of dissection of the descending aorta in the setting of hypertensive crisis 2 years prior. A cerebrovascular accident with respiratory failure and the need for tracheostomy complicated his course at that time. He presented with a 1-week history of progressive substernal chest pressure. He was afebrile with blood pressure 135/67 mm Hg, heart rate 58 and SaO₂ at 97%. Cardiopulmonary examination was normal. His ECG (figure 1A) revealed ST elevations in leads III and aVF with a troponin I elevation of 28. He was started on nitroprusside and esmolol infusion. Catherisation laboratory was activated.

INVESTIGATIONS

- ▶ Cardiac catheterisation (figure 1B) revealed a complete ostial RCA occlusion. During the angiogram (figure 1C), a dissection flap was noted in the right coronary cusp.
- ▶ Aortic CT angiogram (figure 1D) revealed a type A dissection involving the aortic root, measuring 6.3 cm. A dynamic dissection flap extended to the right coronary cusp and appeared to involve the RCA ostium. There was also hypoattenuation in the posterior left ventricular wall and basal septum suggesting hypoperfusion. There was no associated haemopericardium.
- ▶ A bedside echocardiogram revealed left ventricular systolic dysfunction (estimated at 35%) with inferior wall motion abnormalities.

DIFFERENTIAL DIAGNOSIS

The patient was experiencing an inferior myocardial infarction. The investigations above were suggestive that occlusion was at the level of the ostium from an aortic root dissection.

OUTCOME AND FOLLOW-UP

The cardiothoracic surgeon, in evaluating the root dissection, was of the opinion that the patient was not a good candidate for repair given his multiple comorbidities; therefore, neither surgery nor percutaneous intervention was attempted. The patient remained haemodynamically stable and his chest pain resolved. He had no significant arrhythmia or other complications and was eventually discharged.

DISCUSSION

AMI is commonly caused by thrombotic occlusion of an atherosclerotic epicardial coronary artery. Acute aortic root dissection much like acute coronary syndrome occurs in the setting of atherosclerosis and hypertension. Aortic dissection associated with AMI is rare, with a reported incidence of 1–2%.¹ Ischaemia results secondary to coronary orifice obstruction by a dissecting haematoma or intussusception of the disrupted aortic wall layers and can be commonly associated with a haemopericardium or a haemomediastinum. In our case above, the dissection flap moved retrograde, much like a trapdoor, to occlude the right coronary artery at its ostium causing ischaemia to the inferior myocardium.

Aortic dissection in itself may lack classic physical findings such as aortic regurgitation and pulse deficit and initial chest radiograph/ECG may not be helpful.² When an aortic dissection is complicated by an AMI, symptoms of the primary event may be further obscured. Careful attention to the risk factors and assessment of pulses and blood pressures in all limbs may provide clues. We recommend that practitioners have an increased awareness that RCA territory infarctions could be related to an ascending aortic dissection, and to pay attention to traditional historic and exam findings that would suggest the diagnosis of a dissection.

Thrombolysis or percutaneous coronary intervention is currently recommended for an AMI. However, it is absolutely contraindicated in the presence of a dissection, as it may complicate surgical repair of the defect or increase the risk of further dissection. The administration of an antithrombotic agent is associated with increased haemorrhagic pericardial fluid, haemorrhagic pleural effusion and haemodynamic instability and greater in-hospital mortality.³ We further recommend the judicious use of

Figure 1 (A) ECG demonstrating ST elevations in leads II, III and aVF, consistent with inferior myocardial infarction. There are also ST depressions in leads V1 and V2, signifying posterior wall infarction. (B) Angiogram taken during left cardiac catheterisation demonstrating ostial occlusion of the right coronary artery. (C) Ventriculogram showing retrograde dye staining of type A (aortic root) dissection. (D) CT scan of the chest with contrast (CT angiogram) demonstrating aortic root dissection, with true and false lumens.

additional diagnostic studies such as chest CT and intra-vascular ultrasound to ensure that the correct diagnosis is made. Delays in diagnosis can prove to be disastrous.

Competing interest None.

Patient consent Obtained.

Learning points

- ▶ Right coronary artery territory infarctions could be related to an ascending aortic dissection, through retrograde ostial occlusion.
- ▶ Attention to traditional historic and exam findings that would suggest the diagnosis of a dissection.
- ▶ Use of additional diagnostic studies to ensure that the correct diagnosis is made.
- ▶ Review contraindications for thrombolytics prior to use.

REFERENCES

1. **Erbel R**, Alfonso F, Boileau C, *et al*. Recommendations of the task force on aortic dissection, European Society of Cardiology. *Eur Heart J* 2001;**22**:1642–81.
2. **Hagan PG**, Nienaber CA, Isselbacher EM, *et al*. The International Registry of Acute Aortic Dissection (IRAD): new insights into an old disease. *JAMA* 2000;**283**:897–903.
3. **Hansen MS**, Nogareda GJ, Hutchison SJ. Frequency of and inappropriate treatment of misdiagnosis of acute aortic dissection. *Am J Cardiol* 2007;**99**:852–6.

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