Case report

Acute coronary syndrome following repair of aortic dissection

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Abstract

Cardiac complications associated with type A aortic dissections are relatively common before and during the surgical repair. A cardiac event occurring a few days after routine recovery is rare though. We describe a case of acute occlusion of the left anterior descending artery by thrombus, 4 days after surgical repair, salvaged by emergency angioplasty and stenting. A possible explanation for the thrombus includes embolisation of a fragment of glue.

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1. Case

A 59-year-old woman without prior history of angina or breathlessness, presented to the emergency department at another hospital with sudden onset of severe central chest pain and numbness of the left upper limb. Initial examination revealed a regular heart rate of 75 bpm, an arterial blood pressure of 125/65 mmHg, pure heart sounds, symmetrical limb pulses and unremarkable neurological examination. Risk factors for ischemic heart disease included ex-smoking of 10 pack-years, and newly diagnosed hypercholesterolemia. The 12-lead ECG showed no ischemic changes, and the troponin was normal. Within two hours of admission, further chest pain developed associated with left sided hemiparesis, left hemianopia, atrial fibrillation and a diastolic murmur. CT scanning of her brain revealed a small infarct in the right posterior parietal region. Trans-thoracic and trans-oesophageal echocardiograms revealed a dissection flap in the ascending aorta associated with moderate to severe aortic regurgitation. Further computer tomography revealed extension of the dissection flap from aortic root to common iliac arteries involving the innominate and left subclavian arteries.

She was therefore, transferred to a cardiothoracic centre for emergency surgery. After anaesthetic induction, median sternotomy and heparinisation, deep hypothermic circulatory arrest was established with two-stage venous cannulation and axillary artery return. The aortic valve was resuspended with pledgeted prolene sutures. The dissected layers of the aorta at both proximal and distal ends were reapposed using Bioglue sandwiched between external and intra-luminal Teflon strips, and the ascending aorta from just above the sinotubular junction to the distal ascending aorta was replaced with a Haemashield Gold woven double velour graft.

After excellent initial recovery, she suddenly became unwell on the fourth postoperative day, developing acute pain in the left wrist radiating to her arm and back, associated with hypotension, and ECG changes consisting of ST elevation in leads I and aVL with reciprocal changes in lead III. Emergency angiography was performed using a left brachial approach. The left main stem and circumflex arteries were normal. A large thrombus was found in the left anterior descending (LAD) coronary artery, at the level of and including the origin of the first diagonal branch (Fig. 1). The right coronary artery was normal and of large calibre. It was decided to intervene percutaneously. The patient was heparinised with a bolus of 500 IU of unfractionated
A Judkins left 4 guide-catheter was advanced into the left coronary artery. A 0.014 wire was advanced down the LAD and a 3.5 mm stent deployed disobliterating the artery from thrombus. A second wire was placed in the diagonal branch, over which a 2.5 mm medium-length stent was deployed in the diagonal branch (Fig. 1). Following this she returned pain-free and cardiovascularly stable to the coronary care unit.

Although subsequently the troponin I rose to 65, and the total CK to 1480, no new Q waves developed. She developed intermittent atrial fibrillation and was warfarinised. She made an excellent recovery, being discharged 5 days later, and remains well 2 months after the procedure.

2. Discussion

Delayed thrombosis of a coronary artery after surgical repair of acute aortic dissection, is very uncommon. Possible reasons are thrombosis following rupture of a pre-existing coronary plaque, embolisation of aortic dissection associated thrombus [1], or an embolus associated with glue usage. Embolisation of gelatine–resorcin–formaldehyde biological glue to the cerebral parenchyma, following repair of an aortic dissection, has been described before [2]. This may be due to peri-operative migration of the glue into the luminal surface of the aorta and embolisation to the brain. Late obstruction of coronary ostia 8 months following repair of aortic dissection has also been described [3]. This has been attributed to excessive application of formaldehyde glue causing scarring.

On opening the aorta at the time of surgery, thrombus is sometimes found in the aortic lumen [1]. Embolisation of this material into the coronary arteries has been suggested as a possible cause for peri-operative ischemic myocardial dysfunction [4]. Some authors have advocated pre-operative coronary angiography in patients who are stable enough to undergo this or to have their operation delayed [5]. Others have shown though that this only increases mortality, without improving in-hospital survival [6]. These authors found a 3% mortality due to cardiac causes in patients without previous history of myocardial infarct or suspicious symptoms. It is unclear from their discussion though, when these cardiac events occurred.

Neri and colleagues tried to bypass the dilemma of investigating the coronary arteries pre-operatively, by performing an intra-operative angiogram in a patient with a very high likelihood of coronary artery disease [7]. Thrombosis or embolus, occurring 4 days after an uneventful recovery, is clearly very rare. This may occur due to acute plaque rupture, with subsequent thrombosis. Unsuspected significant coronary artery disease was found in a necropsy study of aortic dissections in 22% [8]. There is no data in the literature though to suggest, that performing pre- or intra-operative angiography makes any difference to survival patients in whom coronary artery disease is not suspected. As the coronary arteries were otherwise pristine during the angiogram, this is therefore less likely. Intra-operative embolus of glue or thrombus is also less likely, as this probably would have been apparent during or shortly after the operation. A possible explanation is that a fragment of glue broke loose and embolised later or that an embolus arose from somewhere in the heart. We therefore, feel that clinicians should be aware that these patients are at increased risk of an acute coronary event after aortic dissection repair.

Fig. 1. RAO views of the left coronary system. (A) reveals a large thrombus almost completely occluding the LAD and the first diagonal artery. (B) situation after stenting of both LAD and diagonal arteries, with normal flow into the distal LAD and diagonal artery.
References


