Spontaneous aortic rupture early postpartum without trauma or connective tissue disorder

Ashvini Menon* and Robert S. Bonser†

Department of Cardiothoracic Surgery, University Hospital Birmingham, NHS Trust, Edgbaston, Birmingham, UK

* Corresponding author. University Hospital Birmingham, NHS Trust, Edgbaston, Birmingham B15 2TH, UK. Tel: +44-1216272000; fax: +44-1216272542; e-mail: ashvini.menon@gmail.com (A. Menon).

Received 19 August 2012; received in revised form 11 October 2012; accepted 2 November 2012

Abstract

Rupture of the thoracic aorta is a rare but recognized complication following pregnancy. The common causes of thoracic aortic rupture in the peripartum period are trauma, dissecting aneurysms and saccular aneurysms secondary to systemic connective tissue disease. We report a case of non-traumatic spontaneous aortic rupture in a patient without trauma or systemic connective tissue disease 1 day postpartum, which was successfully managed by surgical repair of the thoracic aorta.

Keywords: Thoracic aorta • Rupture • Pregnancy • Spontaneous

A 17-year-old, previously fit and healthy female presented with severe chest pain and dyspnoea. One day earlier, she had an uncomplicated vaginal term delivery. She was haemodynamically stable. She had no features of Marfan's syndrome and had no history of recent or remote trauma. There was no family history or known genetic predisposition for connective tissue disorders, and fibrillin testing was negative.

Emergency contrast-enhanced computed tomography (CT) scan revealed a contained rupture of the aorta arising from the inferior aspect of the aortic arch beyond the origin of the left sub-clavian artery (LSCA) with a pseudoaneurysm measuring 5 × 4.5 × 3.3 cm (Fig. 1).

The patient underwent emergency surgery via a left posterolateral thoracotomy. Femoro-femoral cardiopulmonary bypass was instituted with profound hypothermia and deep circulatory arrest. A large transmural aortic wall defect was identified on the inferior surface of the aortic arch opposite the LSCA origin. A pseudoaneurysm was compressing the arch and the main pulmonary artery. There was a small haemothorax with extensive mediastinal bruising. The arch and descending aorta were of normal caliber and although thin-walled and elastic, no other predisposing cause for the spontaneous rupture could be identified.

During circulatory arrest, the tear was excised distal to the LSCA. A 22-mm polyester graft was anastomosed end-to-end to the arch and descending aorta. Histology confirmed a tear within the aorta with extravasation of blood through all the layers of the aortic wall. There was no evidence of aortic diverticulum or vasculitis.

The patient made a full recovery and was discharged home on postoperative day 11 with good blood pressure control. Predischarge contrast-enhanced CT confirmed satisfactory repair of the descending thoracic aorta. At 2-year follow-up, the patient remains well, with unchanged aortic appearances.

DISCUSSION

Thoracic aortic rupture in the peripartum period has been associated with aortic dissection, aneurysm formation and trauma. Aortic dissection secondary to connective tissue disorders is the most common cause of aortic rupture in pregnancy. The incidence of aortic dissection and rupture is highest in the third trimester (~50%), followed by the peripartum period (33%) [1].

Spontaneous aortic rupture is rare and has been reported in the non-aneurysmal aorta [2]. Postpartum rupture of a normal-caliber aorta in young women without identifiable predisposing risk factors is exceptionally rare. In this case, the site of the pseudoaneurysm and aortic tear was at the isthmus, the classic site for traumatic injury. The physiological effects of pregnancy begin in the first and second trimester, but are more pronounced in the third trimester and peripartum. Haemodynamic changes in the pregnant state are characterized by an increase in maternal blood volume, heart rate, blood pressure, stroke volume and cardiac output. This leads to greater arterial wall tension and an increase in intimal shear forces [3]. Changes in the structure of the intima and media of arterial wall during pregnancy have been described. Intimal changes reverse after pregnancy, but changes in the media persist [4]. Our case suggests an extreme weakening of the aortic wall associated with pregnancy, predisposing to spontaneous tearing.

Sudden death from acute rupture of the thoracic aorta following pregnancy has been described [5]; therefore, prompt diagnosis and treatment are crucial in the management of these patients. This case highlights that spontaneous aortic rupture in
the postpartum period can occur in the absence of aortic dissec-
tion, aneurysm and trauma.

ACKNOWLEDGEMENT

I would like to gratefully acknowledge R.S. Bonser, who passed
away after the acceptance of this paper, for his enthusiastic
supervision and support. His immense clinical and scientific con-
tribution to cardiothoracic and transplant surgery will be greatly
missed.

Conflict of interest: none declared.

REFERENCES

2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM guidelines for
the diagnosis and management of patients with Thoracic Aortic Disease: a
report of the American College of Cardiology Foundation/American
Heart Association Task Force on Practice Guidelines, American
Association for Thoracic Surgery, American College of Radiology,
American Stroke Association, Society of Cardiovascular Anesthesiologists,
Society for Cardiovascular Angiography and Interventions, Society of
Interventional Radiology, Society of Thoracic Surgeons, and Society for
Spontaneous rupture of the ascending aorta. Eur J Cardiothorac Surg
Maternal complication of pregnancy in Marfan syndrome. Int J Cardiol
[5] Townend JN, Davies MK, Jones EL. Fatal rupture of an unsuspected post-
traumatic aneurysm of the thoracic aorta during pregnancy. Br Heart J

Figure 1: A large aortic pseudoaneurysm (PSA) of the descending thoracic
aorta beyond the origin of the LSCA.