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Case Conference

Acute Type A Aortic Dissection and Successful Surgical Repair in a Woman at 21 Weeks Gestational Pregnancy With Maternal and Fetal Survival: A Case Report

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TYPE A AORTIC DISSECTION during pregnancy is a rare, catastrophic event that is associated with high maternal and fetal mortality. The authors report the successful management of acute type A aortic dissection in a woman at 21 weeks gestation. The patient underwent aortic valve and aortic root replacement utilizing deep hypothermic circulatory arrest complicated by the need for coronary artery bypass grafting due to a kinked/thrombosed right coronary artery. The patient's postoperative recovery and remaining gestation were otherwise uncomplicated, and included a vaginal delivery of a healthy baby at 39 weeks gestation.

Introduction

Type A aortic dissection during pregnancy is a rare catastrophic event associated with high maternal and fetal mortality. Early descriptions of type A aortic dissections in the peripartum period date back to 1944.[1] Cardiovascular disease is the leading cause of maternal death in the United States, including aortic dissection in women with or without risk for pregnancy-associated aortopathy.[2,3] The mortality rate for untreated proximal aortic dissections increases by 1% to 3% per hour after presentation and is roughly 25% during the first 24 hours, up to 70% at 1 week and 80% at 2 weeks.[4] Diseases related to connective tissue disorders and aortic valve and/or aortic abnormalities (ie, bicuspid aortic valve and aortic coarctation) significantly increase the chance of aortic dissection during pregnancy.[5] Due to large vessel remodeling from hormone-mediated changes in collagen and elastin, circulating volume expansion, and fluctuations in blood pressure during labor, pregnancy itself is considered a risk factor for aortic dissection in the absence of comorbidities.[5,6]

Surgical management of type A aortic dissection improves survival in the general population. However, surgery poses unique challenges and risks for the parturient. A type A dissection usually is associated with high maternal risk and

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even higher fetal risk.[5,7–11] Gestational age at the time of aortic dissection and accompanying cardiac surgery is the major determinant for fetal delivery and/or survival. While cardiac surgery consisting of coronary revasculation and valvular repair/replacement has been successfully reported in parturients, there is a high percentage of intrauterine fetal demise when surgery is performed in parturients whose fetal gestational age is less than 28 weeks.[12]

The authors describe the management of a 31-year-old woman at 21 weeks gestation undergoing surgical repair of a type A dissection with full recovery and eventual normal spontaneous delivery at 39 weeks gestation. This case report meets the authors' Institutional Review Board approval; the patient reviewed the report and provided written consent for its publication.

Case Description

A 31-year-old gravida 4, para 3 woman at 21 weeks gestation (height - 167 cm; weight - 95 kg) presented to the emergency department (ED) with the chief complaint of acute substernal chest pain radiating to the back. The chest pain began suddenly approximately 50 minutes prior to arrival in the ED. The patient described the pain as sharp and quantified it as 10/10 in intensity without any relieving factors; she also described feeling lightheaded with "blurry vision" and nausea. The patient had no significant medical history aside from a remote history of Guillain-Barré syndrome associated with left foot drop. She denied a history of hypertension, collagen disorder, or bicuspid aortic valve. In the ED, the patient stated she was unable to move her right foot. She denied any pregnancy-associated medical history including gestational hypertension or pre-eclampsia/eclampsia, and denied any complications with her previous pregnancies. The patient's only medications were prenatal vitamins. The patient denied any alcohol, tobacco, or drug use. Physical exam revealed a gravid female of stated age in acute distress secondary to pain.

On initial presentation, her vital signs were: heart rate 81 beats per minute (bpm), respiratory rate 16 breaths/minute, oxygen saturation 99% on room air, and temperature 36ºC. Left and right non-invasive brachial blood pressures were 92/40 mmHg and 116/58 mmHg, respectively. The neck was supple without jugular venous distension. Cardiovascular auscultation revealed regular rate and rhythm without murmurs or gallops; the lungs were clear to auscultation bilaterally. The abdomen was gravid and size was consistent with gestational age. The fetal heart rate by Doppler ultrasound was 150 to 160 bpm.

Computed tomography with angiography (Fig 1) revealed a 5.8 cm dilatation of the ascending aorta with a dissection flap extending from the aortic root to the descending aorta with extension into the brachiocephalic, left and right common carotid, and left subclavian arteries. The dissection originated in the aortic root adjacent to the aortic valve. A bedside transthoracic echocardiogram (TTE) performed by an ED physician after the computed tomography scan demonstrated widening of the aortic root with a dissection flap. The patient's sodium, potassium, bicarbonate, creatinine, blood urea nitrogen, and coagulation studies were within normal limits. Her complete blood count showed a hemoglobin of 11.1 g/dL. In the ED under ultrasound guidance an 8F double lumen, 16-cm central venous catheter (Arrow International, Asheboro, NC) was inserted into the right internal jugular vein via Seldinger technique with ultrasound guidance.

Urgent multidisciplinary consultation was performed with cardiothoracic surgeons, obstetricians, and cardiac/obstetrical anesthesiologists. The dissection was determined to be life-threatening and required emergency surgery. The team discussed the plan for fetal assessment during the perioperative period and elected to not perform intraoperative electronic fetal monitoring for the following reasons: (1) the planned procedure would not allow for safe interruption of the procedure to perform an emergent cesarean delivery, and (2) an emergent cesarean delivery would be medically futile. Thus, the fetal

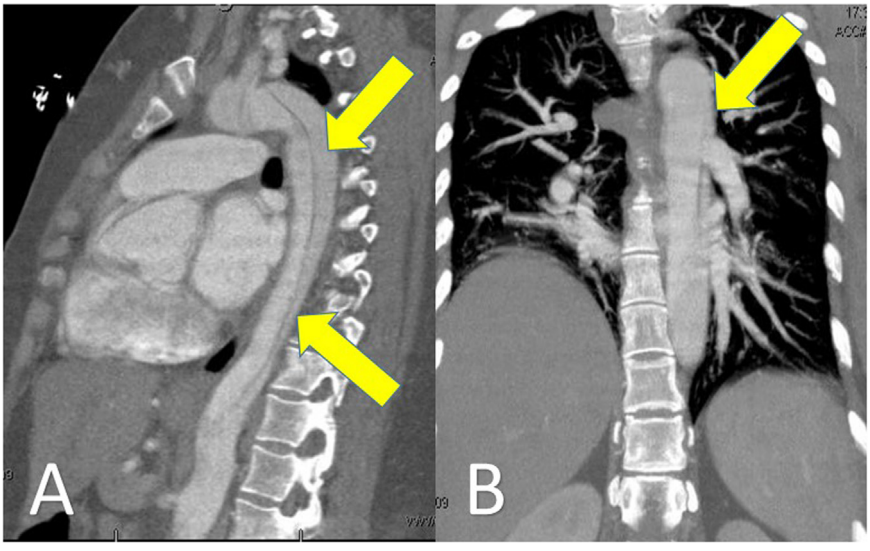

Fig 1. Computed tomography with angiography demonstrating aortic dissection in ascending and descending aorta (yellow arrows). (A) Lateral view. (B) Anterior view.

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