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A case of pregnancy in a patient with aortic dissection: Case report

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Abstract
Aortic dissection during pregnancy is a rare but life-threatening emergency, occurring primarily in the third trimester or postpartum. Patients often present with sudden severe chest or back pain, but diagnosis can be challenging due to symptom overlap with other pregnancy-related conditions. Management requires a multidisciplinary approach balancing maternal and fetal risks. This case provides insight into the successful management of aortic dissection in pregnancy and underscores the critical nature of timely, coordinated care.

Keywords: Aortic dissection, pregnancy, caesarean section

Introduction
Aortic dissection is a life-threatening condition with a high mortality rate of 50% during the first 48 hours and 90% in 3 months. Pregnancy-related AD typically occurs in the third trimester or postpartum period. Approximately 61% of cases occur during pregnancy and 39% postpartum, with a significant portion happening after 30 weeks gestation [1]. The incidence of pregnancy-associated aortic dissection is estimated at approximately 0.0004% per pregnancy. Despite its rarity, its high mortality rates and complex management require thorough understanding within the medical community, especially given the physiological changes of pregnancy that predispose to vessel wall stress [2].
Aortic dissection is rare in young women but, when it does occur, is often associated with pregnancy. During pregnancy, the highest incidence is in the third trimester and the postpartum period. In pregnant women, aortic dissection, poses serious risk for the mother and the foetus and the mortality rates for both the mother and the foetus are high. The ultimate goal is to ensure the safety of both the lives.
We present a case of a pregnant woman 34 years of age, who developed acute Type II aortic dissection at 32 weeks of gestation and successfully underwent caesarean section under general anaesthesia.

Presentation of case
A 34 years female Gravida 5, Para 4 with 32 weeks of gestation, presented with a history of chest pain on and off associated with backache since 5 days. She also complained of a headache. She had been recently admitted to a different center with complaints of severe backache for 3 days. She had been diagnosed with PIH and was on medication. During the evaluation she was diagnosed with type IIIa aortic dissection. She was treated conservatively for management of blood pressure and referred to a higher center.
Upon admission to our center, her blood pressure was 190/98mmHg, pulse 71 beats minute. She was admitted to the labour room and cardiology and cardiothoracic surgery consultations were obtained. Transthoracic echocardiography revealed the presence of a descending aortic dissection, moderate concentric LVH, grade I LV diastolic dysfunction and a normal LV systolic function with ejection fraction of 60%. Her LMP was unknown. Ultrasound examination showed a single live intrauterine pregnancy of 31 weeks 6 days in cephalic presentation with mild oligohydramnios and a mildly increased pulsatility index of the left uterine artery. CT angiography of the aorta showed long segment aortic dissection starting just distal to the left subclavian artery (within 2 cm of left subclavian artery) and extending upto the aortic bifurcation involving bilateral common iliac arteries.

The false lumen was small (on the right side of the aorta), showing increased density of the contrast. No obvious thrombus was detected. The right renal artery was found to be arise from the false lumen.

Fig 1a: Aortic dissection Type B

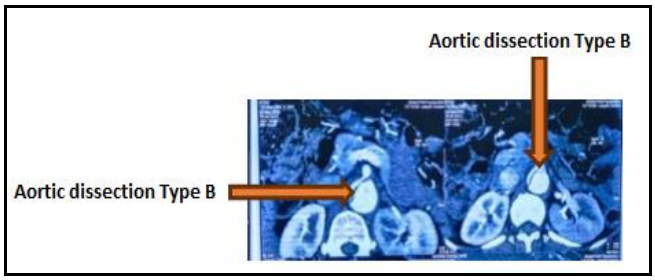

Fig 1b: Aortic dissection Type B

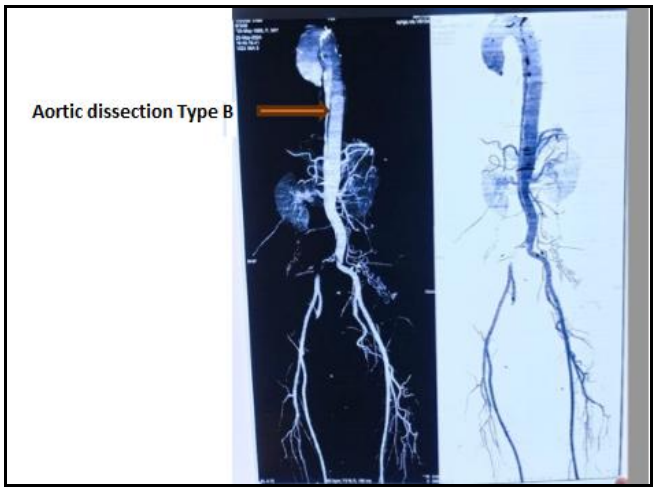

Fig 1c: Aortic dissection Type B

As per cardiology advice, the patient was started on Nicardipine 20mg thrice daily and metaprolol 50mg twice daily for adequate BP control. Serial BP readings showed inadequate control and hence she was started on Nitroglycerin and sodium nitroprusside infusions with titrated dose. She was planned for stenting with debranching at the earliest opportunity. However, serial BP readings were persistently high and she was also administered magnesium sulphate, and medication dosages were increased. The objective was to control of arterial pressure and reduce myocardial contractility with agents that have been used in pregnant women without deleterious effects on the fetus inorder to achieve the haemodynamic goals of systolic pressure less than 130 mm Hg, heart rate between 50 and 70 beat/min).

She was scheduled for elective LSCS. A thorough pre anaesthetic checkup was performed. Her hemoglobin was 11.2 gm/dl, platelet count 213000, blood group O+. The other routine laboratory parameters were within normal limits. High risk consent was obtained and the patient was planned for the surgery under general anesthesia. Pre oxygenation was carried out for 3mins followed by i injection of anesthesia with injection Propofol 200mg in slow titrated doses. Succinylcholine 75mg was used for muscle relaxation to facilitate intubation. She was intubated under direct vision with a size 7 PVC cuffed endotracheal tube. After confirming the placement of the tube with equal bilateral air entry, it was fixed and connected to a mechanical ventilator. Maintenance of anesthesia was achieved with oxygen, nitrous oxide and desflurane with intermittent doses of atracurium. Continuous infusions of inj Labetalol and inj sodium nitroprusside were commenced in order to avoid tachycardia and spiking of blood pressure. After delivery of the fetus she was given inj fentanyl 50mcg intravenously, along with injection oxytocin 10 units intramuscularly and 10 units intravenously. She was also given inj Carbaprost 250mg after delivery of the placenta. A male infant was delivered with a birth weight of 1600 gms. The placenta was also extracted and showed a few calcifications. There was a true knot in the umbilical cord. There was a subserosal myoma on the uterus and myomectomy along with tubectomy was also carried out. Intraoperatively BP was maintained between 140-80 and 110-70 mmHg. Heart Rate was maintained between 80-100/min. The duration of surgery was 70mins. There were no intraoperative complications. She was extubated and shifted to the ICU for close monitoring.

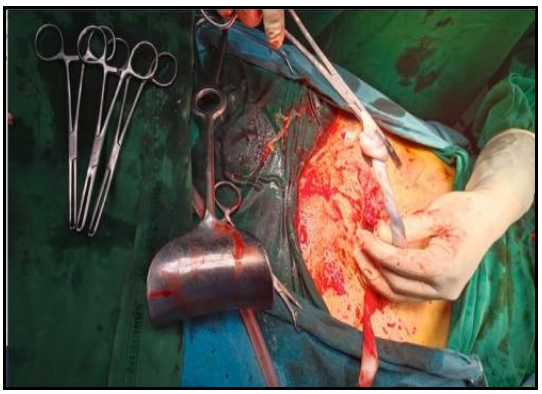

Fig 2a: True knot

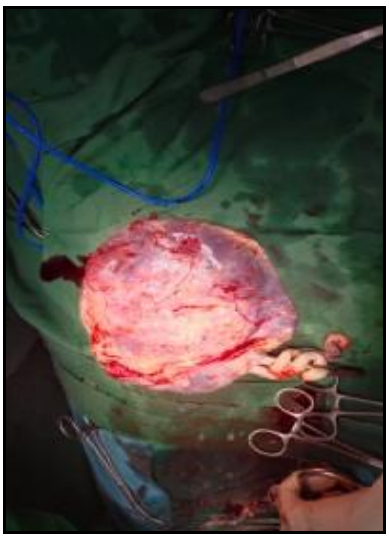

Fig 2b: Placental calcification

Fig 2c: Myoma

During the post-operative period intravenous vasodilators and antihypertensives were gradually tapered off and she was started on oral antihypertensives after consultation with the cardiologist. As her condition clinically improved she was shifted back to the labour ward. Oral medications were continued. Her subsequent recovery was uneventful and she was discharged with the advice to plan for TEVAR after 3 weeks.

Discussion

Aortic dissection during pregnancy is an uncommon but catastrophic cardiovascular event with high maternal and fetal mortality. The physiological and hormonal changes of pregnancy-including increased blood volume, cardiac output and the effect of progesterone on the connective tissue of the aortic wall predispose susceptible women to dissection, particularly during the third trimester and early postpartum period.

Connective tissue disorders, especially Marfan syndrome (mutation in FBN1 gene), are the leading predispositions. Marfan syndrome patients have a 62% prevalence among pregnancy-related AD cases in a meta-analysis, and AD often occurs earlier in gestation among them. Loeys-Dietz syndrome and other inherited aortopathies are also implicated. Other risk factors include chronic hypertension, increased maternal age, and obesity. Structural abnormalities such as aortic aneurysms may precede dissection [3, 4].

In the present case, the patient had pregnancy induced hypertension (PIH), which is a well-recognized precipitating factor for aortic dissection due to sustained haemodynamic stress and vascular endothelial dysfunction. The hallmark symptom of AD is sudden onset, severe chest pain, which may radiate to the back, abdomen, neck, or shoulders, as was witnessed in our case. However, symptoms can be atypical and nonspecific in pregnancy, sometimes mimicking labor pain, gastroenteritis, or pulmonary embolism, leading to diagnostic delay. Other symptoms include dyspnea, neurological deficits, syncope, and hypotension depending on extent and branch involvement. Physical examination findings include disparities in blood pressure between arms or limbs, pulse deficits, new murmurs (aortic regurgitation), and signs of shock in advanced cases. Fetal distress or heart rate decelerations may also be present [5].

Echocardiography (transthoracic or transesophageal) is often the first-line tool, useful for detection of ascending aortic dissection and valve involvement. Computed Tomography Angiography (CTA) offers definitive diagnosis despite radiation concerns, balanced by the risk of missed diagnosis. Magnetic Resonance Imaging (MRI) may be used as a radiation-free option but less commonly in acute settings. Laboratory tests are nonspecific and supportive.

It is crucial to establish the type of Dissection to formulate the management plan. While the definitive treatment of a DeBakey type I or II dissection (involving the ascending aorta) is surgical, for type III dissections (involving the descending aorta) medical management can be considered.

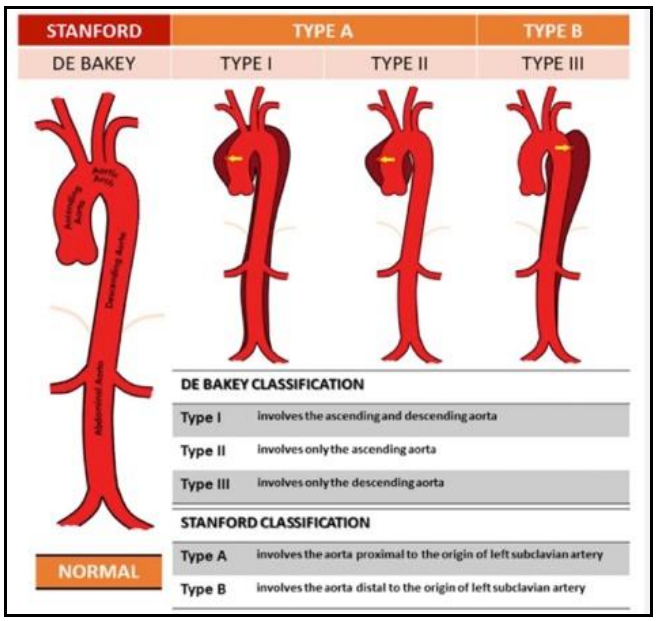

Fig 3: DeBakey/Stanford classifications

Aortic dissection results from a tear in the intimal layer of the aorta, allowing blood to enter the medial layer and create a false lumen, that may propagate longitudinally. Pregnancy introduces hemodynamic and hormonal changes that increase the risk of AD. These include increased circulating blood volume and cardiac output, fluctuating blood pressure especially during labor, and hormonal effects mediated by progesterone and estrogen that degrade collagen and elastin fibers in the vascular wall, leading to remodeling and decreased aortic wall integrity [6].

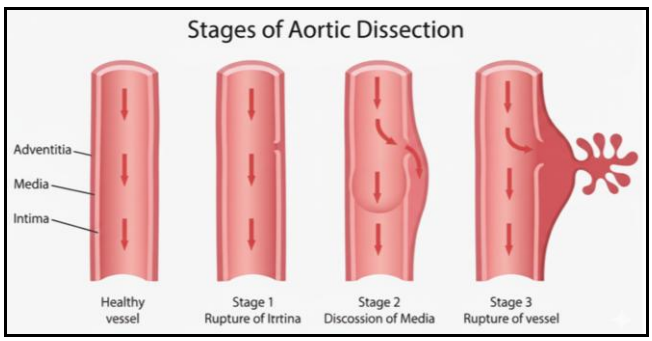

Fig 4: Stages of Aortic dissection

Management of aortic dissection in pregnancy depends on the type of dissection, gestational age and maternal-fetal condition. For type A (ascending aorta) dissections, urgent surgical repair is recommended due to high risk of rupture. In contrast, Type B (descending aorta) dissections can often be managed medically with aggressive blood pressure and heart rate control, unless there is evidence of impending rupture, malperfusion, or hemodynamic instability.

Urgent blood pressure control with beta-blockers and vasodilators is critical to reduce shear stress on the aortic wall and limit dissection progression. Pain management and close hemodynamic monitoring are standard [7].

Indications for surgery include type A (ascending aortic) dissections, suspicion of aortic rupture, or malperfusion syndromes. For type B (descending aortic) dissections without complications, conservative medical management is often attempted unless complications develop [8]. Dissection can also develop postpartum, necessitating ongoing surveillance in women with predisposing conditions. Counseling on future pregnancies and contraception is advised [3].

In this case, the patient was managed with strict hemodynamic control using beta-blockers and vasodilators. The primary goals were to maintain systolic blood pressure below 130mmHg and Heart Rate between 50-70 beats per minute to reduce the aortic wall stress. After stabilization, an elective lower segment caesarian section (LSCS) was performed under general anesthesia, with close intra operative hemodynamic monitoring. The decision for caesarian delivery was guided by the gestational age (32 weeks), presence of maternal instability, and the need to optimize conditions for both mother and fetus.

Anesthetic management in such cases is extremely challenging, requiring meticulous control of blood pressure and heart rate to prevent extension or rupture of the dissection. The intra operative period was uneventful and the patient remained haemodynamically stable throughout. The post-operative course was satisfactory with gradual tapering of intravenous antihypertensives and transition to oral therapy.

Maternal mortality rates ranges from 20% to above 30% depending on study and timing of intervention. Fetal mortality is approximately 25-30%, influenced heavily by gestational age and the timing of delivery/repair [4].

Early multidisciplinary intervention and prompt surgical repair improve outcomes substantially, with successful mother and child survival increasingly reported in case series [9] and as successfully demonstrated in our case. The patient was discharged with her neonate in stable condition and advised for definitive thoracic endovascular aortic repair (TEVAR) after 3 weeks postpartum.

Conclusion

Aortic dissection in pregnancy, is a life-threatening emergency requiring high clinical suspicion, including early recognition of warning symptoms such as severe chest or back pain, especially during late pregnancy. Prompt diagnosis with early imaging utilizing echocardiography or CT angiography is critical to guide multidisciplinary management with timely involvement of obstetricians, anaesthesiologists, cardiologists and cardiothoracic surgeons. For Type B dissections, strict blood pressure control and individualized timing of delivery with careful intraoperative and postoperative hemodynamic management can result in good maternal and fetal outcomes.

Conflict of Interest

Not available

Financial Support

Not available

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