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Learning from errors

Bochdalek hernia in pregnancy

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Summary

Asymptomatic diaphragmatic hernias in reproductive-aged women are rare but pose significant morbidity for pregnancy. This is a case of a woman at 29 weeks' gestation with abdominal pain and shortness of breath. Five years prior she had been incidentally diagnosed with a small congenital diaphragmatic hernia of Bochdalek. Following preconception care, she opted against repair of the hernia prior to pregnancy due to lack of symptoms and no clear recommendation for repair from the surgeon. Imaging studies on emergency room presentation demonstrated a large herniation of viscera into her chest occupying her entire left chest with slight cardiac displacement. Through a multidisciplinary approach, she was stabilised and eventually delivered at 31 weeks due to worsening pulmonary function. The hernia was repaired postpartum. We recommend repair of any diaphragmatic hernia prior to conception to prevent significant maternal and fetal morbidity or mortality. A multidisciplinary approach allows for planning.

BACKGROUND

Incidental Bochdalek hernias, which are congenital posterolateral defects of the diaphragm, are rare. The herniated content contains fat or omentum and if large enough can include solid or enteric organs, such as the spleen, small or large intestines.[1] The major complications of diaphragmatic hernias, especially during pregnancy, are compression atelectasis of the lungs, oxygenation difficulties and strangulation of the herniated internal organs, particularly the bowel or the spleen.[2] The majority of cases of diaphragmatic hernia that are diagnosed in pregnancy require emergency surgery in the second or third trimester with maternal and fetal mortality described.[3]

We present a case of a young woman diagnosed 5 years prior to pregnancy with an incidental Bochdalek hernia, who had preconception care and opted not to undergo repair of the hernia secondary to lack of symptoms and no clear advice to pursue repair. She subsequently became pregnant and experienced complications.

CASE PRESENTATION

A 31-year-old Asian primigravida with a known Bochdalek hernia presented at our institution at 29 weeks gestation complaining of increasing abdominal pain and shortness of breath over several days. The pain was constant and primarily in the left upper quadrant and periumbilical areas, preventing her from lying down. She denied nausea and vomiting. A Bochdalek hernia was diagnosed incidentally 5 years prior on a chest x-ray obtained for work. A subsequent CT at that time demonstrated a left diaphragmatic hernia and associated minor compressive atelectatic changes in the left lower lobe. The hernia occupied only a minimal portion of the lower third of the posterior left chest. Preconception care had included her obstetrician, maternal fetal medicine specialist and a cardiothoracic surgeon. The maternal fetal medicine specialist requested repair prior to pregnancy. The surgeon reviewed the imaging, counselled the patient and discussed the operative procedure with the patient. The surgeon advised the patient to weigh the pre-pregnancy procedural morbidity of repair compared with the likelihood of symptoms in pregnancy, understanding the true number of women who become symptomatic in pregnancy is unknown. The patient subsequently did not pursue repair prior to pregnancy secondary to her asymptomatic status.

On presentation to the hospital, her blood pressure was 126/71 mm Hg, pulse 88 beats/min, respiratory rate 18 breaths/min, temperature 36.5°C and a body mass index of 24 kg/m^2. Her oxygen saturation was 98% on 100% oxygen supplementation via a face mask. Her lung exam revealed clear breath sounds on the right but absent breath sounds on the left; significantly, bowel sounds could be appreciated in the left chest. Her uterus was the appropriate size for her gestational age and her abdomen was non-distended but diffusely tender in the left upper quadrant and without rebound or guarding. Bowel sounds were present. The patient was admitted to the hospital and managed with a nasogastric tube, intravenous fluids and antacids, which provided symptomatic relief to the patient. The nasogastric tube initial drainage was 900 cc of gastric fluid and remained to keep the stomach decompressed.

INVESTIGATIONS

An MRI of the chest, abdomen and pelvis, when compared with prior imaging, revealed significant worsening of the size of the left diaphragmatic hernia (figure 1). Now this large, left diaphragmatic hernia contained the spleen, small and large intestine, stomach and pancreatic body. The left lung field was almost entirely obliterated by the hernia and slight dextrorotation of the heart was noted. The configuration of the stomach was consistent with a likely organoaxial volvulus. No dilated small bowel loops were seen.

TREATMENT

An interdisciplinary team meeting was held between obstetrics, cardiothoracic surgery, general surgery,

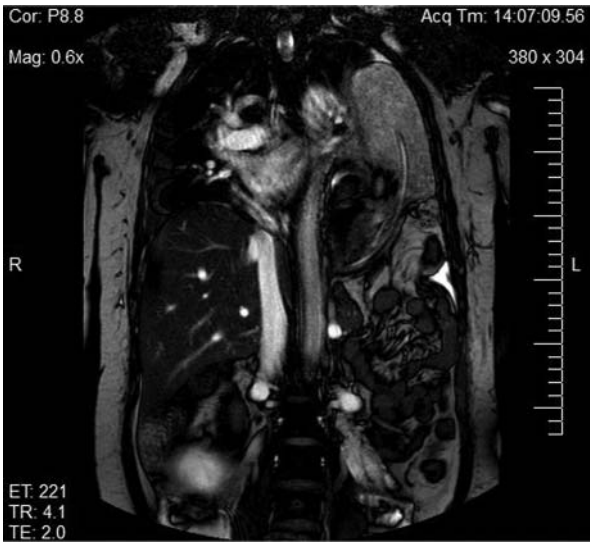

Figure 1 An MRI balance turbo field echo image demonstrating a large left Bochdalek hernia which displaces almost the entire left lung field. The hernia sac contains stomach (nasogastric tube in place), small intestine, large intestine and a portion of the spleen.

anaesthesia, nursing, critical care and the patient to develop a plan of management. A conservative approach, no immediate hernia repair, was formulated secondary to the prematurity of the fetus and the relative stability of the patient in the critical care unit. Owing to worsening of maternal pulmonary status secondary to uterine enlargement, delivery was planned for 31 weeks gestation. Lab work was within expected values and β-methasone was administered to improve fetal outcome. Total parenteral nutrition was initiated to maximise the patient's nutritional status.

OUTCOME AND FOLLOW-UP

A live, 1445 g male infant was delivered by primary caesarean via a Pfannenstiel abdominal incision at 31 weeks gestation, with Apgar scores of 8 at 1 min and 9 at 5 min. The initial postoperative course was uncomplicated and on postcaesarean day 11 the patient underwent a laparoscopic hernia repair procedure involving primary closure of the defect with mesh placement over the repair. The patient did well postrepair and was discharged home on postoperative day 4 with outpatient follow-up.

DISCUSSION

The most common precipitating factor for symptoms in asymptomatic women with an incidental diaphragmatic hernia is pregnancy.[4] The majority of incidental hernias are diagnosed in life-threatening emergency situations requiring surgical intervention.[5] In our patient, the gravid uterus and increased intra-abdominal pressure resulted in the physical displacement of the abdominal organs into the maternal thorax, resulting in our patient's worsening status. Management involved stabilisation of the maternal oxygenation status followed by the determination for acute surgical intervention. A multidisciplinary plan for a conservative approach with repair postdelivery was formulated with close monitoring of the mother and fetus for further compromise.

The foramen of Bochdalek is a 2 cm×3 cm opening in the posterior aspect of the diaphragm which closes by the eighth week of gestation and the failure or incomplete fusion of the diaphragm leads to the development of a Bochdalek hernia.[6] Since the right canal closes before the left side, hernia formation is found 80% on the left side.[6] The incidence of asymptomatic Bochdalek hernia in adulthood was estimated by Mullins *et al*[1] at 0.17%, based on a review of CT exams. Literature supports hernia repair for all healthy surgical candidates regardless of symptoms, prior to pregnancy. In addition, women presenting in the first or second trimester with diaphragmatic hernias should be considered for repair before significant uterine enlargement and potential morbidity can occur.[7]

When surgical repair is considered in the third trimester of pregnancy both the mother and fetus need consideration. The risks of a laparotomy or thoracotomy approach to diaphragmatic hernia repair include anaesthesia risks, preterm labour and pregnancy loss, infection and positioning difficulties attempting to maintain a lateral displacement of the uterus for maternal cardiac venous return. With a laparoscopic approach and the physical changes of pregnancy in the third trimester, there may be additional risks including uterine injury with trocar or insufflation needle placement, difficulty with visualisation secondary to the enlarged uterus or displacement of other intra-abdominal organs and uterine blood flow changes with increased intra-abdominal pressure.[3]

We recommend repair of any known diaphragmatic hernia prior to conception in reproductive-aged women. Repair prior to pregnancy reduces the potential for maternal morbidity and reduces the morbidity of prematurity for the newborn. We also recommend prenatal vitamin supplementation based on the inverse relationship of the B vitamins (ie, folate, vitamins B_1, B_2, B_6 and B_{12}), minerals and vitamin E with congenital diaphragmatic hernias.[8] If a pregnant woman with a diaphragmatic hernia presents for care, a multidisciplinary team approach is also recommended.

Learning points

- We recommend repair of any diaphragmatic hernia prior to conception to prevent significant maternal and fetal morbidity or mortality.
- A multidisciplinary approach allows for planning and management of the patient.
- We recommend prenatal vitamin supplementation based on the inverse relationship of the B vitamins (ie, folate, vitamins B_1, B_2, B_6 and B_{12}), minerals and vitamin E with congenital diaphragmatic hernias.

Competing interest None.

Patient consent Obtained.

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