Hernia Complications During Pregnancy

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Introduction

Approximately four million live births occur annually in the United States, with the risk of acute abdomen requiring surgical intervention occurring in up to 1 in 500 pregnancies [1, 2]. While many of the causes of acute abdomen are related to the pregnancy itself, general surgery disease processes must be considered in the differential diagnosis. Within this chapter, we will detail the evaluation and management of pregnant patients who present with a symptomatic abdominal wall hernia.

Incidence of Abdominal Wall Hernias in Pregnancy

To date, no randomized controlled trial or prospective analysis has detailed the incidence or management of abdominal wall hernias during pregnancy [3]. Therefore, the true incidence of abdominal wall hernias in pregnant patients remains unknown. Nevertheless, in a large, registry-based trial, Oma et al. found that the incidence of umbilical hernias in pregnant patients was 0.08% and that the incidence of inguinal and femoral hernias was 0.12% [4]. While the overall percentage of abdominal wall hernias in pregnant patients is less than 1%, when considered in the context of four million live births, upward of 3200 pregnant women will have a concomitant umbilical hernia and nearly 4800 pregnant women will have a concomitant groin hernia annually. Therefore, both obstetricians and general surgeons must be equipped to evaluate and manage pregnant patients with abdominal wall hernias.

Etiology of Abdominal Wall Hernias in Pregnancy

The incidence of abdominal wall hernias rises dramatically in women, starting at 20 years of age and plateauing at approximately 40 years of age [5, 6]. Because of this pattern, it has been postulated that pregnancy is a risk factor for abdominal wall hernia formation [5]. Furthermore, additional studies have found that pregnancy is associated with an increased risk of abdominal wall hernia recurrence [4]. While the association between pregnancy and abdominal wall hernia formation and recurrence is not completely understood, it is believed that the increased intra-abdominal pressure and hormonal changes associated with pregnancy leads to increased abdominal wall compliance and elasticity, facilitating abdominal wall hernia formation [4, 5].

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Evaluation of Abdominal Wall Hernias in Pregnancy

In their most severe form, abdominal wall hernias can progress to symptoms of incarceration or strangulation. While pain, nausea, and emesis often accompany symptomatic abdominal wall hernias, these are also common symptoms of pregnancy, which can make the diagnosis of an abdominal wall hernia challenging [3, 7]. Therefore, a thorough history and physical examination is an important first step in evaluating a pregnant patient with a suspected abdominal wall hernia. Specifically, these patients should be asked if they have ever been diagnosed with an abdominal wall hernia, if they have noticed a new bulge in their abdominal wall or in their groin independent from their pregnancy, and about their surgical history. Next, in addition to a routine obstetric examination, the abdominal wall and inguinal regions should be inspected and palpated to rule out a hernia.

When there is a high suspicion for an abdominal wall hernia in a pregnant patient that cannot be identified on physical examination, imaging may be necessary. Due to the risk of radiation exposure to the fetus, ultrasound, rather than computed tomography or x-ray, is the preferred imaging modality [3, 8]. The use of ultrasound is advantageous as it can simultaneously rule out an obstetric cause of the patient's symptoms in addition to other general surgery considerations, including appendicitis and cholecystitis [9]. Furthermore, in addition to the diagnosis of abdominal wall hernias, ultrasound can help to rule out varicose veins around the round ligament, which is a potential alternative source of groin swelling [4, 10].

Management of Abdominal Wall Hernias in Pregnancy

Pregnant women present unique challenges to the general surgeon regardless of operative or nonoperative treatment. Nonoperative management can increase the risk of progression to bowel incarceration and strangulation, while operative intervention exposes the mother and fetus to increased physiologic stress and potentially teratogenic medications [11]. As previously discussed, there is a paucity of literature directing the management of pregnant patients with abdominal wall hernias. Herein, we will detail the most recent case series and attempt to make recommendations for these patients.

In a small study by Buch et al., 12 female patients with a known umbilical or groin hernia were followed through the course of their pregnancies [9]. No patient developed hernia incarceration or strangulation, and no patient required emergency hernia repair during pregnancy [9]. All patients underwent hernia repair postpartum. Based on their observations, the authors concluded that umbilical and groin hernias in pregnant patients should be managed with watchful waiting during pregnancy with planned surgical intervention postpartum [9].

A recent study by Oma et al. followed 224 female patients who went on to become pregnant following primary umbilical hernia repair. Although previous studies have shown a lower recurrence rate with mesh versus primary repair in nonpregnant patients, this study found no difference in hernia recurrence rate at an average follow-up time of 3.8 years in female patients who went on to become pregnant regardless of surgical approach or mesh utilization [5, 12, 13].

A systematic review of abdominal wall hernias and pregnancy was performed by Jensen et al. in 2015. In this review, the terms "abdominal wall hernias" and "pregnancy" were searched with PubMED and Embase [3]. Thirty-one studies were reviewed; 4 detailed the outcomes of abdominal wall hernia repair prior to pregnancy, 12 detailed the results of abdominal wall hernia repair at the time of pregnancy, and 15 detailed the results of abdominal wall hernia at the time of cesarean section [3]. A total of 40 patients were described in the case series detailing abdominal wall hernia repair prior to pregnancy. Interestingly, 12 patients had pain during pregnancy related to hernia repair with mesh, and 2 of these patients experienced a hernia recurrence [3, 14, 15]. Of the 12 articles that detailed abdominal wall hernia repair during pregnancy, all studies were case reports and all

patients underwent emergency surgical intervention for hernia incarceration or strangulation, with one patient spontaneously aborting 4 weeks postoperatively [3]. With respect to abdominal wall hernia repair at the time of cesarean section, patients had a higher analgesic requirement and a higher wound infection rate, and short-term recurrence was as high as 29% [3, 16].

Finally, in a large, retrospective database study examining 20,714 women in Denmark, Oma et al. attempted to determine the incidence of umbilical and groin hernias in women of reproductive age [3]. They found that the incidence of umbilical hernias during pregnancy was 0.08% and that no patient with an umbilical hernia required surgical intervention during pregnancy [3]. They also found that the incidence of groin hernias during pregnancy was 0.12% and that no patient with a groin hernia required surgical intervention during pregnancy [3]. Interestingly, 40% of the women who were diagnosed with a groin hernia during pregnancy had spontaneous resolution postpartum, which may be related to round ligament varicosities [3].

Recently accepted for publication in *Hernia* is a study from our institution which uses the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database to detail the incidence and management of umbilical hernias during pregnancy. A total of 126 pregnant patients underwent umbilical hernia repair from 2005 through 2014. A majority of these patients (58%) had incarceration or strangulation at the time of surgical intervention, and almost all patients (95%) underwent open, primary tissue repair of their umbilical hernia. While umbilical hernia repair during pregnancy was associated with minimal maternal morbidity, the risk to the fetus cannot be elucidated from the ACS-NSQIP database.

Unfortunately, it is not known how often abdominal wall hernias become symptomatic during pregnancy [3]. Nevertheless, there are some general conclusions that can be made from the aforementioned studies. First and foremost, approximately 8000 pregnant women in the United States will have a concomitant abdominal wall hernia annually. Therefore, the likelihood of a general surgeon having to evaluate or operate on a pregnant patient during their career is almost inevitable. Second, pregnancy is associated with an increased risk of abdominal wall hernia formation and recurrence. Therefore, ideally, these hernias should be managed nonoperatively until a patient has completed childbearing. Furthermore, because of the higher rate of wound events and hernia recurrence at the time of cesarean section compared to routine abdominal wall hernia repair, pregnant patients with abdominal wall hernias should not undergo routine simultaneous abdominal wall hernia repair at the time of cesarean section. Finally, general surgeons should be reassured that patients who progress to hernia incarceration or strangulation during pregnancy can undergo primary tissue repair with minimal associated maternal morbidity. What remains to be determined is the ideal surgical approach and need for mesh utilization at the time of definitive abdominal wall hernia repair and the effect of general anesthesia and symptomatic abdominal wall hernias on the health of the fetus.

Conclusion

Abdominal wall hernias can be a source of acute abdomen in the pregnant patient. Unless symptoms of incarceration or strangulation are present, abdominal wall hernias should be managed nonoperatively until the postpartum period. Additional research in this area is needed to determine the true incidence and ideal management of abdominal wall hernias in pregnant patients.

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