



ACUTE INTESTINAL OBSTRUCTION SECONDARY TO CLOSED LOOP OBSTRUCTION IN PREGNANCY: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT The acute abdomen is still a challenge for all physicians who are into care of women in pregnancy. Despite all the advancements in medical technology, preoperative diagnosis of acute abdominal conditions is still inaccurate. The most frequent causes of intestinal obstruction are: Closed loop obstruction, Congenital bands, Internal herniation, Volvulus, and invagination. A 22-year-old female primigravida, with persistent pain abdomen, vomiting and abdominal distension with hyperperistaltic bowel sounds with USG and MRI showing intestinal obstruction underwent laparotomy. The presentation, evaluation and management of our case and literature review of similar case are discussed here.

KEYWORDS : Acute intestinal obstruction, closed loop obstruction, volvulus.

INTRODUCTION:

The acute abdomen is still a challenge for all physicians who are into care of women in pregnancy. Despite all the advancements in medical technology, preoperative diagnosis of acute abdominal conditions is still inaccurate. Laboratory parameters are not specific and are often altered as a consequence of physiological changes in pregnancy. The association of pregnancy and acute intestinal obstruction from any cause is fortunately a very rare occurrence.

In 1830 Houston⁽¹⁾ reported the very first case of intestinal obstruction in pregnancy. Since then, numerous cases have been reported. The incidence of acute abdomen during pregnancy is 1 in 500–635 pregnancies^(2,3). The incidence of intestinal obstruction in pregnant is not markedly different in comparison to general population. There has been a debate that whether pregnancy itself predisposes to intestinal problems. Leonard⁽⁴⁾ stated that “normal intrauterine pregnancy rarely, if ever causes intestinal obstruction.” On the other hand, Eliason and Erb⁽⁵⁾ concluded that 28 of their 66 pregnancy related cases of obstruction were because of the pregnancy itself.

Certain anatomic and physiologic changes which are specific to pregnancy may make the cause of the pain difficult to ascertain. As the gravid uterus enlarges and becomes an abdominal organ at around 12 weeks' gestation it compresses the underlying abdominal viscera. This enlargement may makes it difficult to localize the pain and may also mask or delay peritoneal signs⁽⁶⁾. The lax anterior abdominal wall may also delay peritoneal signs. Progesterone decreases lower esophageal sphincter pressure and small bowel motility⁽⁷⁾. Colonic emptying slows in pregnancy but the cause is not clear. A decrease in lower esophageal sphincter pressure leads to heartburn, gastroesophageal reflux, and even stricture formation⁽⁸⁾. The slow colonic transit time may lead to constipation and, subsequently, pain⁽⁹⁾.

The most frequent causes of intestinal obstruction are:

1. Closed loop obstruction
2. Congenital bands
3. Internal herniation
4. Volvulus and invagination

Internal herniation is defined as the protrusion of intestinal loops from fossa, foramen or mesenteric defects in the abdominal cavity and it is one of the uncommon causes of small bowel obstruction⁽¹⁰⁾. The fusion defect of the mesentery and posterior parietal peritoneum creates the potential hernia orifice. It can occur congenitally or acquired depending on inflammation, trauma and previous surgery, like gastric by-pass for bariatric treatment and liver transplantation^(11,12). Paracaecal herniation is a rare type of internal hernia and it constitutes 2% of all internal herniation cases⁽¹³⁾.

Intestinal obstruction is most frequently seen; in the second trimester of the pregnancy when the uterus becomes an abdominal organ, at the end of the third trimester when fetal head engagement occurs and during the early postpartum period when the dimension of uterus changes abruptly.

In most cases, abdominal pain in pregnancy is managed just as in a nonpregnant patient. Surgical treatment is indicated in most cases but the diagnostic criteria, methods of diagnosis, therapy, and consequences of mismanagement differ. Laparoscopic procedures in the treatment of acute abdomen in pregnancy have proved safe and accurate⁽¹⁴⁾. Despite these advances, laparotomy still remains the procedure of choice in complicated and uncertain cases in certain institutions.

The superimposition of an acute intestinal obstruction upon an existing pregnancy produces an interesting, complex diagnostic problem which is difficult to unravel in the preoperative period.

CASE REPORT

A 22-year-old female, primi gravida at 22w + 2 d period of gestation by scan and 27 w + 5 d period of gestation by LMP was referred from Community Health Center to emergency department of MIMS on 7th January with abdominal pain since one day and vomiting 4 episode since morning, patient being a k/c/o pregnancy induced hypertension and was on tab aspirin 150mg OD and k/c/o hypothyroidism on tab thyronorm 12.5 mcg was admitted under dept of obstetrics for further evaluation and management. On detailed examination, patient gives previous history of abdominal surgery at 16-day post birth with no details available and left subcostal incision.

On discussing with pediatric surgeon regarding previous surgery and was concluded that could be done i/v/o correction of diaphragmatic hernia.

Ultrasound evaluation showed dilated bowel loops? Small bowel obstruction, surgery opinion was sought as the patient had persistent pain abdomen since day 1 and 10-12 episodes of non-bilious non bloodstained vomiting and complaint of obstipation since day 1.

Patient was examined, on examination patient had abdominal distension with aggravated bowel sounds. Patient was planned on conservative management i/v/o previous surgery and anticipating secondary adhesions which are most common post surgery, appropriate antibiotics, RT insertion with continuous aspiration and foleys catheterization with input output monitoring was done. Patient was reviewed the next day, on 8th January and was symptomatically better and decreased episodes of vomiting and decreased abdominal distention and the patient was continue on conservative management. Patient was reviewed the next day on 9th of January and abdominal distension had increased with 2 episodes of vomiting with aggravated bowel sounds. Patient hadn't passed flatus or feces ever since she had presented.

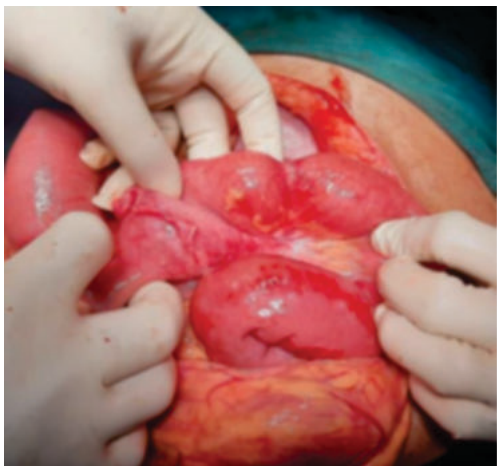
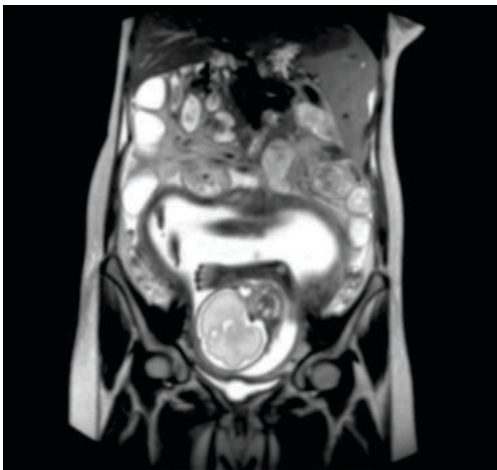
As the patient was 22 w + 4 d period of gestation X ray was not advised and repeat ultrasound was advised, as ultrasound could not yield significant details regarding the pathology, test MRI was performed and was shown to have acute/subacute obstruction with minimal ascites with collapse distal ileum and large bowel -? distal jejunal or proximal ileal obstruction. Discussion was done with radiologist

regarding Gastrograffin challenge test, not done as per their advice to get MRI instead.

Patient following day did not have any episode of vomiting hence was again planned on conservative management and was reviewed the next day on 10 January and showed no improvement in symptoms and hence MRI was repeated. Findings was consistent with the previous MRI hence call was taken to take the patient up for emergency laparotomy and to proceed and the same was explained to the patient attenders and the by-standers.

After taking written and video consent the patient was posted for emergency OT on 10th of January at 5:00 PM, with assistance from obstetrician, a team of 3 surgeon went ahead with laparotomy and intraoperatively was found to have closed loop intestinal obstruction with proximal constriction because of internal herniation of the ileal loop through transmesentery loop and the distal constriction due to congenital band compressed by gravid uterus and showing dilated segments of ileum between constrictions with adhesions at and around previously operated site in left subcostal region and underwent adhesiolysis, band release and correction of internal herniation and was done under GA. Patient was shifted out in a stable condition with flatus tube in situ. Patient was shifted out in stable condition to post op obstetrics ward for fetal monitoring. POD-1 was uneventful and the patient had hypokalemia (K=3.4) drain output was 10 ml serosanguinous and had passed feces through the flatus tube and RT aspirate of about 300 ml bilious. Flatus tube was removed the same day. POD-2, patient had passed flatus, POD-3 Ryles tube was removed and patient was started on sips of water. POD-4 the potassium is 3.1 hence advice to take coconut water with IV potassium correction, as the drain had no significant output the drain was removed on POD-5. Hypoalbuminemia and hypokalemia was noted on POD-6 and the patient was advised to take high protein diet and was put on Syrup Potassium chloride and patient was advised discharge as the patient was tolerating oral diet and was symptomatically better.

Post operatively continuous fetal monitoring showed no fetal compromise.



DISCUSSION:

Bowel obstruction is the third most common cause of acute abdomen during pregnancy, occurring in 1 in 1500–16,000 pregnancies^[15]. Adhesions are found in 60–70% of cases (previous abdominal surgery, pelvic surgery, or pelvic inflammatory conditions)^[16], followed by volvulus, which occurs in approximately 25% of cases [35]. This differs from the incidence of volvulus in nonpregnant patients, which is 3–5%^[17].

It is estimated that the incidence of both closed loop obstruction and internal hernia is 0.2–0.9%^[18], accounting for 0.6–5.8% of all cases of small bowel obstruction^[19]. Most internal hernias were caused by mesenteric defects due partly to surgical operations such as Roux-en-Y gastric bypass procedure^[20]. Congenital transmesenteric hernias are even less, constituting only 5–10% of internal hernias^[21,22]. The incidences of congenital transmesenteric defect and hernias in pregnant woman are unknown. The acquired defect is usually attributed to abdominal surgery and traumatic laceration. In our case, the patient had no history of any trauma and defect unrelated to previous surgery. Thus, mesenteric defect was regarded as congenital. Paraduodenal herniations are the most frequent form of internal herniations, and they constitute about 53% of all internal hernias^[23]. The other types of internal herniations are trans-mesenteric, paracaecal, transomental and foramen Winslow herniations. Paracaecal herniation comprises 2% of all the internal herniation cases^[24].

The diagnosis may be masked due to some circumstances that can be seen during pregnancy such as abdominal distension, nausea and vomiting, tension pain of the ligamentum rotundum, uterine contractions, and leukocytosis. Colic type pain due to intestinal obstruction may be mistaken for uterus contractions.

Avoiding examinations involving radiation such as direct radiography and computerized tomography in pregnancy may cause a delay in the diagnosis. The findings in intestinal obstruction do not exhibit any remarkable differences between pregnant and non-pregnant women.

Abdominal tomography is the imaging modality of choice for the investigation of acute abdominal conditions^[25]. The accuracy of CT in the detection of small bowel obstruction possesses a sensitivity and specificity of 94–100% and 90–95%, respectively^[26]. The direct signs of a closed-loop at CT are a U- or C- shaped, fluid filled, distended intestinal loop or a radial array of distended loops with stretched and thickened mesenteric vessels converging to a central point. Thus, a cluster of dilated loops or a 'sac-like appearance' of crowded small bowel loops must recall internal herniation^[27]. Actually, radiation exposure from a CT and X-ray is usually at a negligible dose far below 50 mGy safe for fetus, and intravenous iodinated contrast material is also generally judged to be safe during pregnancy.¹⁰

Sonography remains the first line of imaging in pregnant patients presenting with acute abdomen. Patient triage or additional imaging may be obtained on the basis of the US findings^[28]. In patients with abdominal symptoms the indication either for CT or MR depends on the presumed disease. Every abdominal CT during pregnancy should include an estimation of radiation dose, but when required, low-dose CT of the abdomen and pelvis can be performed with minimal risk^[29].

MRI has the advantage of the lack of ionizing radiation. MR is an accurate investigation in detecting the cause of acute abdominal and pelvic pain during pregnancy and should be considered after US indeterminate findings^[30]. Oto et al. suggests that MR imaging is an excellent modality for diagnosis of acute abdominal conditions and exclusion of diseases requiring surgical or interventional treatment^[31]. Moreover, MRI has no superiority over the CT scan in finding suggestive signs of internal hernia including the clustered loops, dilated and displaced bowel loops, or mesenteric edema^[20].

Alternatively, a one-half solution of Gastrograffin and barium by mouth or via a Levin tube, followed by serial x-rays, can differentiate mechanical obstruction from ileus and partial blockage from complete obstruction. This latter procedure minimises the potential complication from use of barium in precipitating a frank intestinal blockage.^[32]

Treatment of intestinal obstruction in a pregnant female is no different from nonpregnant patient, surgery is the only definitive treatment.

Delay can be catastrophic to both mother and fetus. Preoperative stabilization of vitals and electrolyte imbalance and dehydration is very much essential. The abdominal incision should be vertical and well placed, and ample in size to allow good exposure to the bowel in the presence of an enlarged uterus and to permit minimal manipulation of the uterus. In general, best results are seen when surgery is done without disturbing the pregnancy.

CONCLUSION:

Pregnancy does not increase the incidence of intestinal obstruction. Although intestinal obstruction is a common condition seen by general surgeons, it is extremely challenging to establish the diagnosis during pregnancy. Based on our experience and the contemporary literature, we recommend that urgent MRI of the abdomen should be undertaken to diagnose the aetiology of small bowel obstruction in pregnancy. In cases of adhesion causing small bowel obstruction, conservative treatment may be safely practiced, with a low threshold for laparotomy. In other causes, such as volvulus or internal hernia, laparotomy remains the treatment of choice. Best results are seen when surgery is done without disturbing the pregnancy, provided proper fetal monitoring is done.

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