

# Successful Laparoscopic Treatment of Small-bowel Obstruction in Early Pregnancy

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## Abstract

Small-bowel obstruction (SBO) during pregnancy is uncommon and can be difficult to diagnose. Therefore, the condition is associated with significant maternal and fetal mortality. We report a case of successful laparoscopic treatment of SBO in early pregnancy. A 37-year-old woman presented with diffuse abdominal pain and vomiting at 8 weeks of gestation. She had a history of abdominal surgery. Exploratory laparoscopy was performed by a gastrointestinal surgeon because SBO, and specifically strangulated ileus, was strongly suspected. On entry into the abdomen, dilated small bowel was visible in the pelvis; this was attached to the pelvic wall and twisted near the right adnexa. The small bowel initially appeared dark and congested, but after releasing the adhesions, it regained its normal color, was viable, and peristalsis was observed. Therefore, bowel resection was not required. No recurrence was observed after food ingestion, and the patient was discharged 12 days after surgery.

**Keywords:** Laparoscopy, pregnancy, small-bowel obstruction

## INTRODUCTION

Acute abdomen during pregnancy is often encountered and may require surgery. The common nonobstetric abdominal surgical conditions encountered during pregnancy are acute appendicitis (1 in 1000–2000 deliveries), cholecystitis (1 in 1000 deliveries), pancreatitis (1 in 1000–5000 deliveries), and small-bowel obstruction (SBO).<sup>[1]</sup> SBO in pregnancy is rare (reported incidence 1 in 2,500 deliveries),<sup>[2]</sup> but it is associated with a significant risk of maternal (6%) and fetal (26%) mortality.<sup>[3]</sup> Most of the cases are thought to occur during the third trimester and are generally treated using open surgery;<sup>[4]</sup> few cases of SBO during pregnancy treated using laparoscopic surgery have been reported. This article reports the successful laparoscopic treatment of SBO during early pregnancy.

## CASE REPORT

A 37-year-old woman was hospitalized at 8 weeks of gestation because of diffuse abdominal pain and vomiting.

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She had a history of laparoscopic total proctocolectomy and ileoanal anastomosis for ulcerative colitis; this surgery had been performed after a previous pregnancy, and there had been no postoperative complications. On this occasion, she became pregnant through artificial insemination. On physical examination, she appeared ill, with vital signs as follows: body temperature – 36.6°C, blood pressure – 100/41 mmHg, and pulse rate – 80 beats/min. She vomited a few times after arriving at the hospital. Her abdomen was distended and displayed intermittent tenderness in the lower portion. Vaginal examination revealed no bleeding or signs of imminent abortion. The results of the laboratory investigations conducted on admission were as follows: white blood cell count –  $9.6 \times 10^3/\mu\text{L}$ , hemoglobin – 11.5 g/dL, and C-reactive protein – 0.05 mg/dL, with the bilirubin, alanine transaminase, alkaline phosphatase, lactate dehydrogenase,

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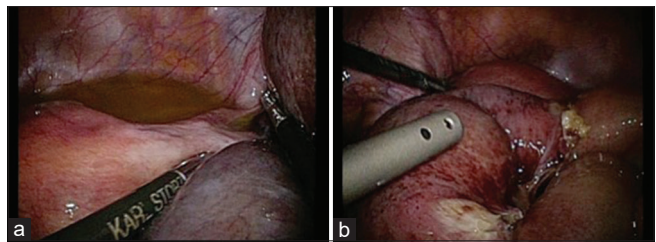
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creatine phosphokinase, blood urea nitrogen, serum creatinine, and amylase values being within the normal ranges. Arterial blood gas values were as follows: pH – 7.621, partial pressure of arterial carbon dioxide – 13.7 mmHg, base excess – 4.9 mmol/L, sodium ion – 133 mEq/L, chloride ion – 107 mEq/L, hydrogen carbonate ion – 14.3 mEq/L, anion gap – 11.7 mEq/L, and lactic acid concentrations – 4.4 mmol/L. These results suggested metabolic acidosis and respiratory alkalosis. Transabdominal ultrasonography revealed diffuse fluid-filled small-bowel loops with poor peristalsis. However, the uterus and bilateral adnexa were normal, and a fetal heartbeat (FHB) was detected in the uterine cavity. An abdominal X-ray revealed a dilated small bowel with an abnormal gas pattern, suggestive of intestinal obstruction. A preoperative diagnosis of intestinal obstruction during pregnancy was made.

Subsequently, a contrast-enhanced computed tomography (CT) scan was considered to determine the site of the obstruction, but instead, an exploratory laparoscopy was performed by a gastrointestinal surgeon, because the patient had a history of abdominal surgery, and her high lactic acid concentration was suggestive of progression to strangulated ileus, necessitating immediate surgery. Under general anesthesia, a 12-mm port was placed in the umbilical region and three 5-mm ports were placed in the right and left upper quadrants and left lower quadrant of the abdomen. On entry into the abdomen, dilated small bowel was visible in the pelvis. This small bowel was attached to the pelvic wall and twisted near the right adnexa [Figure 1a]. The small bowel appeared dark and congested initially, but after releasing the adhesions, the bowel regained its normal color and was viable [Figure 1b]. Furthermore, bowel peristalsis was observed 20 min later; therefore, small-bowel resection was not required. The FHB was present before and after surgery, and the postoperative recovery of the patient was uneventful. No recurrence of the bowel obstruction was observed after food ingestion, and the patient was discharged from the hospital 12 days after surgery. The pregnancy appeared normal at 12 and 16 weeks of gestation, but intrauterine fetal death occurred at 18 weeks, the cause of which was unknown.

## DISCUSSION

SBO in pregnancy is rare, but late diagnosis may be associated with adverse events in both mother and fetus. Although an accurate diagnosis is required, the diagnosis of SBO is often challenging. A previous history of abdominal surgery may be suggestive of SBO, but instances of SBO developing in the absence of any surgical history have been reported.<sup>[5]</sup> Other factors that complicate the diagnosis include maternal physiologic changes during pregnancy making physical examination more difficult, the need



**Figure 1:** Intraoperative photographs. (a) Loop of small bowel, twisted and attached to the pelvic wall near the right adnexa. The small bowel appeared dark and congested. (b) After releasing the adhesions, the bowel regained its color and was viable

to differentiate SBO from obstetric complications, such as hyperemesis gravidarum, and the risk to the fetus of radiologic investigations.

Many reports have shown that CT is useful for the diagnosis of SBO, and if necessary, this should be performed without delay.<sup>[6]</sup> In the case reported here, the diagnosis of SBO was relatively easy, being possible on the basis of the history and imaging findings. Therefore, and because strangulated ileus was strongly suspected, surgery was performed promptly, without CT being performed. As a result of this decision, the need for intestinal resection may have been avoided, and for this reason, exploratory surgery may be indicated without the delay required for CT examination. The safety of anesthesia during pregnancy for both obstetric and nonobstetric conditions has been well established.<sup>[7]</sup> General anesthesia is not associated with a higher risk in pregnant women. Furthermore, there is no evidence to show that the currently used anesthetic agents are teratogenic in humans at any gestational age when the standard concentrations are used. Therefore, pregnant women should not be denied surgery that is indicated, regardless of their trimester.<sup>[4]</sup>

Laparoscopy is now widely used as a diagnostic and therapeutic tool for the care of pregnant women with abdominal pain. It is well tolerated by both mother and fetus, with minimal adverse effects having been recorded during all three trimesters.<sup>[8]</sup> SBO due to adhesions is more common in advanced pregnancy, with 6%, 28%, 45%, and 21% of cases occurring during the first, second, and third trimesters and the puerperal period, respectively.<sup>[4]</sup> In the late second trimester and beyond, laparoscopy becomes technically difficult, and therefore, open incision may be preferable; indeed, previously reported cases of SBO during pregnancy have usually been treated using open surgery. For laparoscopy, open trocar placement into Palmer's point is recommended, to avoid injury to the uterus during entry,<sup>[9]</sup> and the surgeon should be careful not to touch the uterus thereafter. Palmer's point is in the left upper quadrant, 3 cm below the costal margin, in the midclavicular line. Immediate preoperative and postoperative fetal monitoring is recommended if the fetus is capable of surviving early delivery.

In the present case, the patient presented in early pregnancy, immediately after the onset of symptoms; therefore, it was possible to release the adhesions and reverse the ileus using laparoscopic surgery. If the gestational age makes laparoscopic surgery difficult, or if intestinal resection is considered necessary, open surgery should be selected instead of laparoscopic surgery. A published series of cases of SBO caused by adhesions during pregnancy showed that the prevalence of fetal mortality resulting from surgery is 0%, 18%, and 13% during 1–12 weeks, 13–28 weeks, and 29–40 weeks of gestation, respectively.<sup>[10]</sup> Unfortunately, intrauterine fetal death occurred in the present case, but 2 months had passed since the surgery, and this was therefore unlikely to be related to the procedure.

## CONCLUSION

Laparoscopic surgery is a minimally invasive treatment for SBO during pregnancy. When a substantial number of cases have been treated in this way, statistical analysis of the success rate should be performed.

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## Ethical statement

The ethics committee of Hyogo Prefectural Nishinomiya Hospital has approved human experimentation. Institutional Review Board Project #31-36 was obtained on October 1<sup>st</sup> 2019.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her

consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest

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