Case Report

A Case of Intestinal Obstruction in Pregnancy Diagnosed by MRI and Treated by Intravenous Hyperalimentation

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1. Introduction

Intestinal obstruction in pregnancy is rare, and it is mainly caused by prior pelvic surgery. We herein report a case of intestinal obstruction in a pregnant female with a history of laparoscopic myomectomy, who presented with hypogastric pain, abdominal distension, and vomiting at 26 weeks of gestation. A simple intestinal obstruction was diagnosed by MRI. Conservative treatments, including intravenous hyperalimentation and the placement of an ileus tube, were provided and her abdominal symptoms improved for 14 days. After restarting oral intake, she had no abdominal symptoms. She gave birth to a 2,146 g female infant by caesarean section at 37 weeks and 1 day of gestation. Although an area of cicatrization, which was thought to have been the starting point of the occlusion that caused the intestinal obstruction, was found, the excision of the small intestine was not necessary. Her postoperative course was uneventful. Intestinal obstruction requires a prompt diagnosis and aggressive intervention may be necessary to minimize the morbidity and mortality associated with this rare complication of pregnancy. MRI can be safely used during pregnancy to diagnose intestinal obstruction and intravenous hyperalimentation may improve the maternal and fetal prognoses.

2. Case Report

A 37-year-old woman (Gravida 0, Para 0) was referred to our institution at 25 weeks and 4 days of gestational age with symptoms of abdominal pain and vomiting. She had a history of appendectomy and laparoscopic myomectomy. Her body temperature was 36.6°C, her heart rate was 65 beats/min, and blood pressure was 120/67 mmHg. Her abdomen was soft, flat, and without tenderness; her bowel sounds were enhanced. She had a WBC count of 12,380/μL and CRP level of 0.58 mg/dL. The other laboratory data were within the normal limits. Her cervix was uneffaced and the cervical os was closed. Because her symptoms were improved by intravenous feeding and the administration of an antispasmodic agent, she was diagnosed by acute gastroenteritis and discharged to return home. At that time, she had no sign of threatened labor. However, her abdominal pain and vomiting did not improve and she was hospitalized the next day. On the third day of hospitalization, her symptoms worsened. Her abdomen
became distended and bowel sounds were absent on physical examination. Abdominal X-rays showed air-fluid level of small intestine (Figure 1), and she was diagnosed with small bowel obstruction. It was thought that her obstruction had been caused by adhesion. Cardiotocography revealed irregular uterine contraction. She was treated with an intravenous infusion, antibiotics, antiemetics, and a β-2 stimulant for tocolysis. On the fourth day of hospitalization, she exhibited frequent bilious vomiting. MRI confirmed the dilation of loops of the small bowel, with the starting point of the obstruction located in the ileac part, contacting the right side of the uterus (Figure 2), but no sign of strangulation obstruction was observed.

Conservative treatment was continued, a nasal ileus tube and central venous catheter were inserted and total parenteral nutrition (TPN) was initiated. TPN was used from the 8th day to the 20th day of hospitalization and was not changed to PPN. Her abdominal symptoms gradually improved, and on the 8th day of hospitalization (gestational age: 26 weeks and 6 days) she showed flatus. On the 14th day of hospitalization (gestational age: 27 weeks and 4 days), she resumed oral intake with fluid food. After the initiation of oral intake, her abdominal symptoms stabilized. The ileus tube and central venous catheter were removed on the 17th and 20th days of hospitalization, respectively. She felt irregular uterine contractions, and her cervical length shortened to 15 mm. Therefore, she remained hospitalized for tocolysis between the 21st and 80th days. The remaining course of her pregnancy was uneventful, without a relapse of the intestinal obstruction relapse or any signs of threatened labor. As she did not request vaginal delivery after myomectomy, she received caesarean section on the 81st day of hospitalization (gestational age: 37 weeks and 1 day) and delivered a healthy baby girl weighing 2,146 g. The baby had a good APGAR-score 9 (1 min)/10 (5 min) and no fetal distress (umbilical artery gas, pH 7.301; BE, 0.1 mmol/L). The mesenterium and the uterus fundus were covered with fibrous material. Figure 3 shows redness and cicatrization of the small intestine and the mesenterium, 20 cm cephalad from the terminal ileum, which was thought to be the starting point of obstruction.

3. Discussion

We reported the case of a primiparous woman with simple intestinal obstruction that was diagnosed by MRI, who was successfully treated using a conservative approach that included TPN with intravenous hyperalimentation. She was able to safely deliver an infant at term.

The diagnosis and management of acute abdominal pain during pregnancy are often challenging. The most common
nonobstetric abdominal conditions that require surgical in
pregnancy are acute appendicitis, bowel obstruction, chole-
cystitis, and pancreatitis. Intestinal obstruction in pregnancy
is rare and is the second most common nonobstetric reason
for surgical intervention during pregnancy [1]. The incidence
of intestinal obstruction in pregnancy ranges from 1 in 1,500
to 1 in 66,000 deliveries [2, 4]. Adhesion from previous
abdominal surgery, which is implicated in 60–70% of cases
of mechanical obstruction, is most common etiology of this
condition. An additional 25% of cases result from volvulus,
while intussusception causes 5% of cases [5, 6]. The rates at
which intestinal obstruction due to adhesion are detected
during the first, second, and third trimester of pregnancy
and postpartum are 6%, 27%, 44%, and 21%, respectively [7].
The common symptoms of intestinal obstruction in preg-
nancy include abdominal pain (98%), vomiting (82%), and
constipation (30%). Abdominal tenderness and abdominal
peristalsis are observed in 71% and 55% of the patients,
respectively [1]. The further displacement of the abdominal
organs as pregnancy progresses results in the presentation of
symptoms at atypical locations [5].

Although rare, intestinal obstruction during pregnancy
is associated with a maternal mortality rate 6–20%, while
fetal loss occurs in 26–50% of such cases [4]. The early
diagnosis and successful treatment of intestinal obstruction
during pregnancy are therefore paramount for maintaining
the wellbeing of both the mother and fetus [6]. The diagnosis
of intestinal obstruction can be confirmed by a number
of modalities. Ultrasound scan may demonstrate fluid-filled
bowel loops, and plain abdominal radiography can be helpful
for making the diagnosis. Although the reported sensitivity
in pregnant patients has been found to be low [5], computed
tomography (CT) is the mainstay imaging modality that
is applied in the management of small bowel obstruction
in nonpregnant patients. In pregnant patients, however, CT
exposes the fetus to ionizing radiation. MRI is capable of
providing large field-of-view images of maternal abnormal-
ities with excellent soft-tissue contrast and allows for the
pancreatic and biliary ducts, blood vessels, and genitourinary
tract to be observed without the intravenous administration
of a contrast agent. Furthermore, images obtained with
MRI do not expose the fetus to ionizing radiation and
are often diagnostic without the need for the intravenous
administration of contrast material [8]. MRI is useful in the
evaluation of pregnant patients with abdominal symptoms,
both for delineating the anatomy and for excluding a variety
of candidate pathological processes that may give rise to small
bowel obstruction [8].

The treatment of intestinal obstruction in pregnant
women is similar to that of nonpregnant women. In the
absence of signs of peritonitis, conservative treatment should
initially be attempted. Since intra-abdominal surgery can
lead to premature uterine contractions, tocolytic agents are
administered prophylactically when conservative therapy
fails and when there are signs of impending bowel strangula-
tion [1]. In the third trimester, if adequate intestinal exposure
cannot be obtained, caesarean section must be performed
[9]. In the presence of severe malnutrition, pregnancy is
associated with an increased risk of spontaneous abortion,
congenital malformation, fetal growth restriction, preterm
delivery, and perinatal mortality and morbidity [3]. In preg-
nant women with an inadequate oral intake, underlying
disease states that require complete bowel rest or severe illness
should be treated with TPN by intravenous hyperalimen-
tation. TPN might promote fetal growth in cases involving
fetal growth restriction due to severe maternal nutritional
deprivation [10]. TPN can be helpful and lifesaving for
malnourished pregnant women [3].

We reported a case of a primiparous woman with a simple
intestinal obstruction that was diagnosed by MRI and who
was successfully treated using a conservative approach that
included TPN with intravenous hyperalimentation. An infant
was safely delivered at term. In cases involving pregnant
women with a history of abdominal surgery who have symp-
toms of intestinal obstruction, including abdominal pain,
nausea, vomiting, and abdominal distension, the intestinal
obstruction should be early diagnosed and treated in the same
manner as in nonpregnant women.

Abbreviation
MRI: Magnetic resonance imaging
WBC: White blood count
CRP: C-reactive protein
TPN: Total parenteral nutrition
CT: Computed tomography.

Consent
Written informed consent was obtained from the patient for
the publication of this case report and the accompanying
images.

Competing Interests
The authors declare no conflict of interests in association with
the present study.

Authors’ Contributions
The patient was under the care of Atsushi Daimon and
Daisuke Fujita; and Yoshito Terai operated on the patient.
Atsushi Daimon and Daisuke Fujita analyzed and inter-
preted the data. Atsushi Daimon and Yoshito Terai wrote
the manuscript. Masahide Ohmichi made additions to the
manuscript. All authors reviewed and approved the final
manuscript.

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