

# INTESTINAL OBSTRUCTION DURING PREGNANCY

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Intestinal obstruction is a rare cause of acute abdominal pain during pregnancy. We reviewed and analyzed the medical records of four pregnant women with intestinal obstruction, treated at the Department of Surgery in the Kaohsiung Medical University Hospital during a period of 19 years, between June 1984 and December 2002. Their ages ranged from 22 to 35 years (mean, 28 yrs). Three cases had had prior lower abdominal surgery. Adhesion was the unique finding in all four patients during the operation. Enterolysis was needed to release the intestinal obstruction in three of the patients; the fourth required resection and anastomosis of the ileum as a result of volvulus. Premature labor was prevented with tocolysis in two patients. The results of this study lead us to emphasize the importance of close observation and early surgery to avoid intestinal strangulation if a pregnant woman who develops intestinal obstruction has an old surgical scar on her abdomen. Premature labor may be avoided with tocolysis.

**Key Words:** intestinal obstruction, ileus, pregnancy  
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Intestinal obstruction occurs rarely as a cause of acute abdominal pain during pregnancy. The incidence of intestinal obstruction during pregnancy ranges from 1 in 1,500 to 1 in 66,431 [1]. However, delayed diagnosis can cause intestinal strangulation, which results in a high incidence of maternal morbidity, mortality, premature labor, and fetal loss. Reduction of the incidence of these complications depends on recognition of the disorder as early as possible. However, an accurate diagnosis is difficult with pregnant women, because in pregnancy the symptoms of intestinal obstruction are common and nonspecific. In this study, we analyzed our past experiences on intestinal obstruction during pregnancy.

## MATERIALS AND METHODS

The medical records of four pregnant patients with intestinal obstruction treated at Kaohsiung Medical University

Hospital between June 1984 and December 2002 were reviewed retrospectively (Table). Their ages ranged from 22 to 35 years (mean, 28 yrs). The gestational stage ranged from 12 to 28 weeks. Three patients had prior surgical histories for retroperitoneal lipoma, right ovarian cyst, and acute appendicitis, respectively. The associated symptoms, including abdominal colic and bilious vomiting, were present in all four patients. Preoperative white blood cell (WBC) counts ranged from 14,510 to 20,210 cells/ $\mu$ L. None of the patients had fever before surgery. The length of time from the onset of symptoms to hospital admission (patient delay) ranged from 7 to 72 hours. The length of time from hospital admission to surgery (surgeon delay) ranged from 8.5 to 16.5 hours. Laparotomy was performed when the diagnosis of intestinal obstruction was established. All patients received parenteral antibiotics preoperatively.

## RESULTS

Adhesions were found in three patients during surgery, and enterolysis was performed to release the obstruction. An adhesive band caused by the previous appendectomy resulting in volvulus at the terminal ileum was found in patient no. 4. The adhesive band was lysed, and the dilated

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**Table.** Four patients with intestinal obstruction during pregnancy

Patient no.	1	2	3	4
Age (yr)	35	26	28	22
GPA*	G4P0A3	G5P2A2	G1P0A0	G1P0A0
Gestation period (wk)	12	22	28	27
Surgery history	Retroperitoneal lipoma	Nil	Right ovarian cyst	Appendectomy
WBC count (cells/ $\mu$ L)	18,300	18,900	14,510	14,201 $\rightarrow$ 20,210
Patient delay (hr)	Unknown	48	72	7
Surgeon delay (hr)	15.0	8.5	16.5	16.0
Surgical findings	Adhesion	Adhesion	Adhesion	Ileal volvulus caused by adhesion bands
Bowel strangulation	-	-	-	+
Surgical procedure	Enterolysis	Enterolysis	Enterolysis	Segmental resection for strangulated ileum
Tocolysis	-	+	+	-
Fetal results	Elective abortion	41 wk, female, 3100 g, NSD	39 wk, male, 3200 g, NSD	38 wk, male, 3000 g, C/S

C/S = cesarean section; NSD = normal spontaneous delivery; WBC = white blood cell.

\*G = gravida; P = para; A = abortion.

and strangulated terminal ileum was resected. A postoperative elective abortion was performed on one patient to avoid teratology, and two patients chose tocolysis because of premature labor pain. None of the side effects of tocolysis occurred (e.g. paralytic ileus or pulmonary edema). None of the patients had surgical complications. One patient had a cesarean section and the other two patients had normal vaginal deliveries at the end of their gestational periods.

## DISCUSSION

Intestinal obstruction during pregnancy is not common, but related maternal morbidity and mortality, premature onset of labor, and fetus loss are high [1]. Connolly et al reported that the common causes of intestinal obstruction during pregnancy were adhesion (54.6%), volvulus not due to adhesions (24.5%), intussusception (5.1%), carcinoma (3.7%), hernia (1.4%), and others (10.7%) [1]. Half of these

patients with intestinal obstruction during pregnancy due to adhesions had a history of appendectomy [2]. Adhesion was the reason for intestinal obstruction in all four of our patients, but only three of them had a history of lower abdominal surgery. We suspected that a possible intra-abdominal inflammation such as pelvic inflammatory disease resulted in adhesive band formation in the patient who had no history of surgery. When there is neither a surgical history nor intra-abdominal inflammation, malrotation or other congenital anomalies should be considered [3,4].

The distortion in the normal relationships of intra-abdominal organs in the abdominal cavity caused by the enlarging uterus was believed by William and Beck [5] to explain why previously asymptomatic adhesions can cause intestinal obstruction during pregnancy. Unfortunately, sometimes the increased abdominal girth associated with obstruction is not easily distinguished from the effect of increased uterine growth [6], which may mask the severity of bowel obstruction and result in delaying diagnosis.

It is not unusual to mistake the symptoms induced by intestinal obstruction for 'morning sickness' during the first trimester of pregnancy. However, the morning sickness usually occurs in the early morning and lasts for only a few hours. Although morning sickness is sometimes accompanied by vomiting, the vomitus is usually nonbilious [7,8]. Therefore, a pregnant patient with persistent and progressive bilious vomiting must be examined carefully, especially if she has a history of abdominal surgery or the symptoms appear in the second and third trimesters.

The WBC count can reach 15,000–20,000 cells/ $\mu$ L during normal pregnancy [9,10], as a result of increased adrenocortical activity [6]. Patient no. 4 had a WBC count of 14,201 cells/ $\mu$ L at her admission, which rose to 20,210 cells/ $\mu$ L 15 hours later. Therefore, frequent serial examination of WBC counts may be necessary to arrive at a definitive diagnosis in a pregnant woman. In addition, there was no relationship between necrotic changes in the bowels and a delay in surgical intervention in this series. Patient no. 4 had the shortest delay to surgery, but she developed intestinal necrosis that required resection of the ileum.

The most common postoperative complication is premature labor. Allen et al [11] found that patients with premature labor had usually had a longer delay before surgery, indicating that early surgical intervention might prevent this complication. Tocolysis on two patients in our series prevented premature labor, and both of them underwent surgery more than 48 hours after symptoms began. There were no tocolysis-related side effects such as paralytic ileus or pulmonary edema. Prophylactic tocolysis may be unnecessary if there are no symptoms or signs of premature labor during the second trimester or if surgical intervention will be scheduled within 48 hours. Fetal outcome in our hospital is excellent, and all three survived. This favorable result can be attributed to the immediate surgery and the prevention during surgery of maternal hypotension and hypoxia. The median length of time from admission to laparotomy in our series was 14 hours as compared with 48 hours in the study of Perdue et al [2].

## CONCLUSIONS

The probability of intestinal obstruction must always be kept in mind when a pregnant woman with an operation scar on her abdomen develops abdominal pain. Delay in surgical intervention is common in pregnant women with intestinal obstruction, because the symptoms and signs during pregnancy are usually nonspecific. The policy of 'admit and observe' should be used, with close observation and frequent re-evaluation in any suspicious cases. Repeated physical examination and serial WBC counts may be necessary to make an early and accurate diagnosis. Adequate fluid and electrolyte replacement, appropriate administration of antibiotics, and intensive care are essential. Premature labor may be avoided with tocolysis during the second trimester, as well as early surgical intervention. Prophylactic tocolysis may be unnecessary if there are no symptoms or signs of premature labor in the second trimester.

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# 懷孕時期的腸阻塞

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腸阻塞引起的腹部急症在懷孕時期並不常見，我們回顧並分析 1984 年 6 月到 2002 年 12 月在高雄醫學大學附設醫院外科住院的病患中，共有四位孕婦 (年齡從 22 至 35 歲，平均 28 歲)，因為腸阻塞接受手術治療。雖然只有三位病患曾經接受下腹部手術，腸粘連是這四人發生腸阻塞的共同原因，除其中一位因小腸扭轉缺血壞死須切除部分小腸外，其餘三人只需剝離腸粘連即可解除腸阻塞。兩位孕婦在子宮鬆弛劑的幫助下成功避免流產及早產。由於本研究的經驗，我們建議曾經接受腹部手術的孕婦一旦出現腸阻塞的症狀時，宜密切觀察和謹慎評估，必要時及早手術，以避免腸壞死。子宮鬆弛劑通常可以成功避免流產。

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