

Adynamic Ileus and Acute Colonic Pseudo-obstruction Occurring After Cesarean Section in Patients With Massive Peripartum Hemorrhage

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The clinical histories (including radiographs) of 4 patients who suffered from significant adynamic ileus or acute colonic pseudo-obstruction after cesarean section are presented. The main manifestations were vomiting, severe colicky pain, and abdominal distension. These can occur immediately after or within 2 days of the operation. Based on our experience, the risk factors for the development of adynamic ileus are significant peripartum hemorrhage leading to unstable hemodynamic status, severe constipation, use of meperidine for pain relief, and overt bowel manipulation. Mild enema and metoclopramide seem to be helpful in facilitating its resolution. Here, we examine how to differentiate mechanical bowel obstruction from adynamic ileus and look at how to prevent the occurrence of adynamic ileus while minimizing its severity and shortening its clinical course. [*J Chin Med Assoc* 2009;72(12):657–662]

Key Words: adynamic ileus, cesarean section, constipation, hemorrhage

Introduction

Although postoperative ileus affects all segments of the intestinal tract, the colon takes longest to recover.¹ Small bowel function generally returns within 24 hours, and the stomach returns to normal in 24–48 hours. Peristalsis of the colon may not return until 72 hours after surgery. Acute colonic pseudo-obstruction is a variant of ileus, characterized by massive colonic dilatation. Detailed information and radiographs of severe adynamic ileus and acute colonic pseudo-obstruction occurring after cesarean section (CS) have been mentioned only rarely in the recent literature. If not recognized promptly or managed appropriately, acute colonic pseudo-obstruction may result in cecal or colonic rupture.^{2,3}

Here, 4 cases of postoperative ileus are reported with a summary of the clinical key points mentioned in related articles, including presumed pathogenesis, symptoms/signs, differential diagnosis, and treatment

methods to minimize the severity or duration of the condition.

Case Reports

Case 1

A 32-year-old woman had a history of 2 previous CS and severe constipation. She underwent CS, bilateral ligation of the fallopian tubes and adhesiolysis for pelvic adhesion under spinal anesthesia at 37 weeks of gestation. Significant uterine bleeding (2,500 mL) occurred due to uterine atony and placenta previa, causing transient hypotension during the operation. Packed red blood cells (RBC) (2,000 mL) and 4 units of fresh frozen plasma (FFP) were given. Meperidine was administered for pain relief postoperatively. However, she experienced severe abdominal distension (especially over the patient's epigastric area) with excruciating abdominal colicky pain, vomiting, tachycardia,



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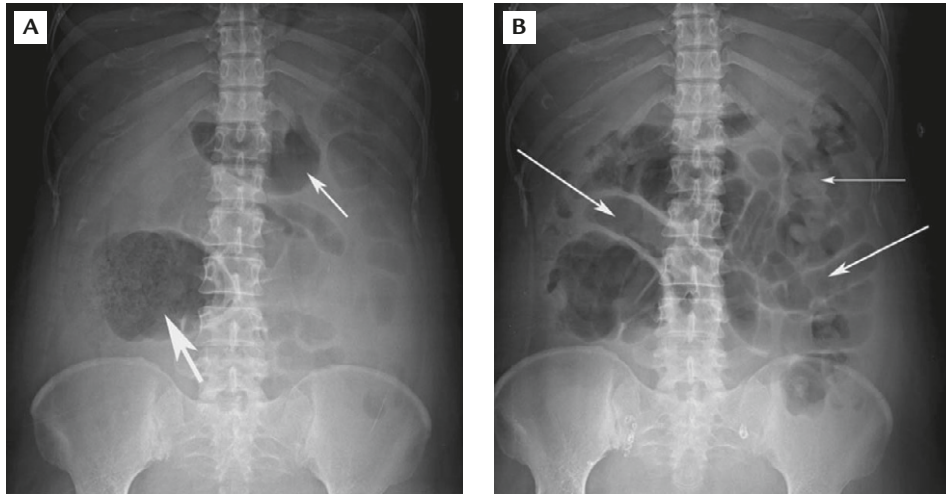


Figure 1. Radiographs of Case 1 show: (A) a distended stomach (small arrow) and cecum (11 cm in diameter, large arrow) with stool inside it; (B) 1 day later, passage of stool to the descending colon (small arrow) and distension of the small intestine (large arrows).

and tachypnea. Physical examination showed a tympanic abdomen (especially over the upper abdomen) with hypoactive bowel sounds and diffuse tenderness. A distended stomach and cecum (11 cm in diameter) were seen on abdominal radiographs (Figure 1). Adynamic ileus with acute colonic pseudo-obstruction was suspected. Nasogastric tube decompression was performed to relieve severe vomiting. In addition, persistent vaginal bleeding was noted even after administration of oxytocin, methylergonovine, and prostaglandin E1 (rectal insertion). Additional packed RBC (1,000 mL) and FFP (2 units) were given. The patient then underwent bilateral percutaneous transcatheter embolization of the internal iliac arteries using coils on postoperative day 1. The uterine bleeding ceased soon after the procedure. With supportive treatment, including nasogastric tube placement (until day 3), glycerin ball enema (days 2–4) and metoclopramide (days 2–4), the adynamic ileus gradually improved and the patient tolerated oral intake on day 5. She was discharged on day 8 without any sequelae.

Case 2

A 30-year-old pregnant woman had a history of severe constipation. She underwent CS with spinal anesthesia at 39 weeks of gestation because of prolonged second stage (cervical fullness for 3 hours, station +2). Massive uterine bleeding (about 3,000 mL) occurred as a result of a deep laceration from the uterine incision wound into her uterine cervix, leading to unstable hemodynamic status and vomiting during the operation. Packed RBC (2,500 mL) and FFP (6 units) were given. No intra-abdominal bleeding was identifiable after closure of the uterine incision and laceration wound. However, postpartum vaginal bleeding

was noted at the end of CS. Because of persistent uterine bleeding even after administration of tranexypromine, oxytocin, methylergonovine, prostaglandin E1 (rectal insertion), and intrauterine compression with a rolling gauze inserted through the cervix os, the patient received additional blood transfusion (1,000 mL of packed RBC, 2 units of FFP) and underwent percutaneous transcatheter embolization of the right internal iliac artery (coils and Gelfoam) and left uterine artery (coils) on postoperative day 1. This controlled the uterine bleeding. Meperidine was used for postoperative pain relief. However, abdominal distension with colicky pain and vomiting occurred on postoperative day 2. Hypoactive bowel sounds and diffuse abdominal tenderness, but not rebounding pain, were noted. Adynamic ileus was demonstrated in radiographs with significant distension of the colon and small intestine (Figure 2A), which gradually improved after supportive treatment, including nasogastric tube decompression (days 2–3), glycerin ball enema (days 3–4), metoclopramide (days 3–4) and ambulation (day 3). Oral intake commenced on day 5. The patient was discharged on day 7 in a stable condition.

Case 3

A 28-year-old woman, with negative RhD and a history of constipation, suffered from acute antepartum hemorrhage (>1,500 mL within 20 minutes) at 32⁺⁵ weeks of gestation, resulting in unstable hemodynamic status. CS under general anesthesia was performed immediately. Total hysterectomy and bilateral ligation of internal iliac arteries were then performed as posterior placenta increta was incidentally discovered during the operation. The patient received 3,000 mL of packed RBC and 10 units of FFP, including 2,000 mL of

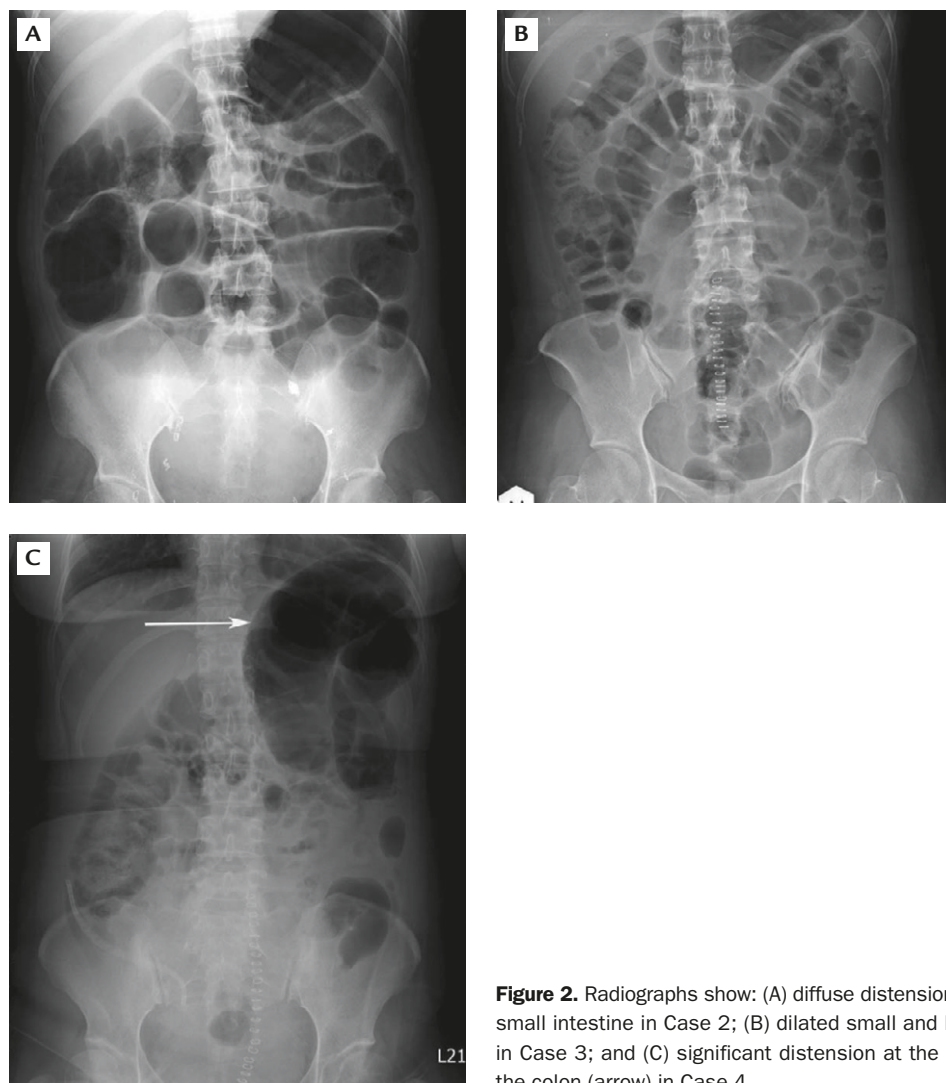


Figure 2. Radiographs show: (A) diffuse distension of the colon and small intestine in Case 2; (B) dilated small and large bowel loops in Case 3; and (C) significant distension at the splenic flexure of the colon (arrow) in Case 4.

RhD-positive packed RBC as a result of lack of stored RhD-negative RBC. Pink urine containing uric acid precipitation for 1 day was noted after transfusion. There was no other sign of significant hemolysis during the postpartum period. Meperidine was given for postoperative pain control. Adynamic ileus was noted on postoperative day 1 (Figure 2B). Abdominal distension, colicky pain, and no flatus passage lasted for 3 days. These were all gradually resolved after supportive management, including glycerin ball enema (days 2–3), metoclopramide (days 2–4), and gum chewing (day 3). The patient was discharged on postpartum day 7. The patient was still healthy at follow-up 3 months later.

Case 4

A 29-year-old woman had a history of chronic constipation. She underwent CS at 37 weeks of gestation

under spinal anesthesia because of a breech presentation and previous myomectomy (>90 myomas). Severe adhesion between the anterior uterine surface and the abdominal wall restricted access into the abdominal cavity during the operation. After meticulous adhesiolysis, a longitudinal incision through the upper portion of the uterus was made. Significant bleeding ensued because of the considerable difficulties in delivering the baby and closing the uterine incision wound. The bleeding was mainly attributed to dense adhesions, a thick uterine wall, and poor elasticity of the uterus due to fibrosis. Packed RBC (2,500 mL) and 8 units of FFP were given. Oxytocin, vasopressin, and prostaglandin E1 (rectal insertion, postoperatively) were given to reduce uterine bleeding. GYNECARE INTERCEED® (ETHICON Inc., a Johnson & Johnson Company, New Brunswick, NJ, USA) was applied to the rough surface over the uterus to reduce further adhesion

Table 1. Summary of clinical courses in 4 cases

	Case 1	Case 2	Case 3 RhD(-)	Case 4
CS indication	Placenta previa + 2 previous CS	Cervical dilation full for 3 hr	Antepartum massive hemorrhage, shock	Breech, previous myomectomy
Constipation	Severe	Severe	Severe	Severe
Anesthesia	Spinal	Spinal	General	Spinal
Intestinal manipulation	Tubal ligation + adhesiolysis	Severe vomiting at operation	Hysterectomy	Intra-abdominal dense adhesion
Blood loss at operation	2,500 mL	3,000 mL	> 3,500 mL	2,500 mL
Cause of blood loss	Uterine atony	Cervical laceration	DIC, placenta increta	Severe adhesion
Blood transfusion	2,000 mL RBC, 6 U FFP at POR + 1,000 mL RBC, 2 U FFP	2,500 mL RBC, 6 U FFP at POR + 1,000 mL RBC, 2 U FFP	3,000 mL RBC, 10 U FFP, including 2,000 mL RhD(+) RBC	2,500 mL RBC, 6 U FFP
Pelvic artery embolization	(Postoperative) d 1	d 1	No	No
Unstable vital signs	Severe, at operation	Severe, at operation	Severe, at operation	Mild, at operation
Use of meperidine	+	+	+	+
Onset of symptoms	At POR	d 2	d 1	d 1
Symptoms	Vomiting, severe colicky pain, tachypnea	Vomiting, severe colicky pain, distension	Colicky pain, distension	Pain, distension, delayed flatus passage
Signs	Hypoactive bowel sound, tympanitic, tenderness	Hypoactive bowel sound, tympanitic, tenderness	Hypoactive bowel sound, tympanitic, tenderness	Tympanitic, tenderness
Radiograph findings: dilation of	cecum (11 cm), stomach, small intestine	colon, small intestine (diffuse dilation)	colon, small intestine (loops)	colon, splenic flexure
NG decompression	d 0–3	d 2–3	No	No
Glycerin ball enema	d 2–4	d 3–4	d 2–4	d 2–3
Metoclopramide	d 2–4	d 3–4	d 2–3	d 2–3
Oral intake	d 5	d 5	d 4 (gum-chewing on d 3)	d 4 (gum-chewing on d 3)

CS=cesarean section; DIC=disseminated intravascular coagulation; RBC=red blood cell; FFP=fresh frozen plasma; POR=postoperative recovery room; NG=nasogastric.

formation. Meperidine was given for pain relief. Adynamic ileus with colonic distension at the splenic flexure occurred on postoperative day 1 (Figure 2C). This was gradually resolved over 3 days after supportive management (mild enema, metoclopramide, and gum chewing). The patient was discharged on day 8 with occasional abdominal distension and mild vaginal spotting.

The summary of clinical courses in the 4 cases is shown in Table 1.

Discussion

The precise mechanism of adynamic ileus remains unknown, although it is likely to be related in part to excessive parasympathetic suppression or sympathetic stimulation in the regulation of intestine motility.^{3,4} Intraoperative spillage of irritating substances, intestine manipulation, and the release of inflammatory mediators may affect the neuronal pathways of the intestine.¹ Adynamic ileus has been associated with

surgery (especially CS and hip surgery), cardiac failure, respiratory failure, opioid use, spinal anesthesia, neurological problems, infection, electrolyte imbalance, and stress that causes central secretion of corticotrophin-releasing factor (which, in turn, inhibits gut motility).^{1,3} From observations in this report, all 4 cases with adynamic ileus were associated with: (1) acute massive hemorrhage leading to unstable hemodynamic status, which may have caused transient poor blood supply to the intestine and colon as a result of shifting blood supply to vital organs; (2) severe constipation, which may have resulted in stool impaction, bowel dilatation, and exacerbation of poor bowel movement; (3) the use of meperidine for postoperative pain relief; and (4) CS and bowel manipulation, especially with adhesiolysis, tubal ligation, hysterectomy, internal iliac artery ligation, and significant vomiting occurring during the operation as a result of unstable hemodynamic status.

The incidence of adynamic ileus varies following each type of surgery. For example, the incidences for hip replacement, spine surgery, and knee replacement are 1.3%, 1.19%, and 0.65%, respectively.³ Based on 6 years of observation in our hospital, 925 patients who underwent CS without massive hemorrhage did not suffer from adynamic ileus. Only 3 of 71 patients who underwent CS with significant peripartum hemorrhage (>2,000 mL) suffered from adynamic ileus. It is reasonable to presume that acute massive peripartum hemorrhage following CS plays an important role in the development of adynamic ileus. It is also likely that the other 3 factors listed above aggravate the condition.

Precisely excluding mechanical obstruction and meticulously assessing for signs of ischemia or perforation are important to avoid serious complications.³ Rapidly progressive pain, intractable emesis, fever with leukocytosis, peritoneal sign, dilated bowel loops with air-fluid levels, and persistent lack of air in the colon or rectum may indicate a mechanical obstruction. Serial follow-up radiographic examinations and close observation of clinical symptoms/signs are mandatory to exclude mechanical obstruction, a late onset of bowel ischemia, or perforation. Bowel distension for more than 6 days or a dilated cecum exceeding 12 cm in diameter may potentially increase the risk of bowel perforation.^{1,3} Passage of oral contrast into the colon is delayed in ileus, but is completely blocked in total mechanical obstruction.⁵ A sign that there is a gradual shift of bowel air or stool into the colon and rectum usually indicates a good prognosis. However, a markedly distended rectum filled with air (Figure 3), but with no passage of flatus, is probably a sign of

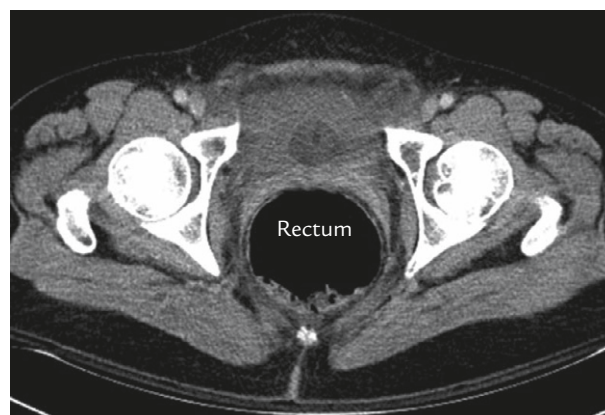


Figure 3. Computed tomography shows a dilated rectum filled with air but with no flatus passage in a patient with postoperative ileus due to pelvic abscess caused by inadvertent injury of the sigmoid colon.

pelvic abscess due to an injury to the sigmoid colon during the operation.

Based on previously published articles and this report, adynamic ileus may be alleviated by the correction of electrolyte imbalance, early ambulation and changing the patient's position, nasogastric tube decompression for severe vomiting or gastric dilatation, mild enema, avoiding opioid use for pain relief, use of a laxative, gum chewing, alvimopan, and neostigmine.^{1,6} Metoclopramide also seems effective in our experience, although this contrasts with the findings of Traut et al.⁶ Alvimopan has the potential to be useful because it selectively blocks the effects of opioids throughout the gastrointestinal tract without affecting its central analgesic effects. However, the development of alvimopan was recently suspended because of cardiovascular and neoplastic side effects.¹ Neostigmine is, at present, considered to be the standard medical therapy for acute colonic pseudo-obstruction. However, it may cause bradycardia, increased salivation, and bronchospasm. Glycopyrrolate has been reported to diminish the central cholinergic effect of neostigmine without affecting its colonic effect.

For pregnant women with severe constipation, correction of poor bowel habits during pregnancy and the performance of an enema before CS may help minimize the occurrence or lessen the severity of adynamic ileus. During CS, reducing blood loss, early blood transfusion, maintaining a stable hemodynamic status, minimizing operation time, and avoiding intestinal protrusion out of the abdominal cavity due to vomiting are probably helpful in preventing the development of adynamic ileus. For postoperative pain control, nonsteroidal anti-inflammatory drugs may be considered in place of opioids for high-risk patients

if there is no persistent postpartum hemorrhage. Administration of thoracolumbar epidural anesthesia using local anesthetics provides pain relief comparable with that of systemic opiates, and may reduce the duration of postoperative ileus.^{1,7}

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