Early postoperative feeding after major gynecologic surgery: Evidence-based scientific medicine

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Postoperative gastrointestinal care after major gynecologic surgery has evolved considerably over the last decade. This article provides a historical perspective of how postoperative gastrointestinal care has evolved and describes current approaches to gastrointestinal postoperative care after major gynecologic surgery that adhere to evidence-based scientific medicine. A MEDLINE search from 1966 to 2000 was performed in an effort to locate all studies concerning early postoperative feeding after major gynecologic surgical procedures.

Key words: Early postoperative feeding, major gynecologic surgery

Evaluation of scientific data

The 1990s have ushered in the era of evidence-based scientific medicine. In the past, medical practice was based mainly on anatomic features, physiologic characteristics, previous experience, and expert opinion. At present we are attempting to base medical practice on evidence-based scientific medicine. Table I lists the classifications of scientific data.

Traditional postoperative feeding protocol

The traditional postoperative feeding protocol after major abdominal surgery has included nasogastric decompression. Nasogastric tubes are removed when bowel sounds, flatus, and bowel movement are present and nausea, vomiting, and abdominal distention are absent. If nausea and vomiting do not develop in the patient after removal of the nasogastric tube, a clear liquid diet is begun and diet is slowly advanced to solids over several days. The rationale for the traditional postoperative feed-
After abdominal surgery, normal right colonic activity was localized the transmitters in the right ascending colon. Capsules. Abdominal x-ray films the morning of surgery before surgery 39 patients swallowed radiotelemeterizing intestines in animals and man. Woods et al placed electrodes in the stomach, small bowel, and ascending colon and descending colon in monkeys. Myoelectrical activity of the intestine was observed at a baseline, after anesthesia and after abdominal surgery. Anesthesia alone had little effect on intestinal motility; however, anesthesia with abdominal surgery caused a significant change in the motility of the intestine. The stomach and small intestines returned to normal activity within 8 hours. However, the right colon took 48 hours and the sigmoid colon 72 hours to return to normal contractility. Wilson performed a similar study in humans. The night before surgery 39 patients swallowed radiotelemeterizing capsules. Abdominal x-ray films the morning of surgery localized the transmitters in the right ascending colon. After abdominal surgery, normal right colonic activity was delayed for 48 hours. Although the term paralytic ileus is incorrect, because stasis of the ileum lasts for only 8 hours after operation, it is clear from these and other studies that significant rectosigmoid stasis persists for approximately 3 days after major abdominal surgery. These studies have shown that the length of the surgical procedure and the amount of intestinal manipulation had little effect on colonic stasis, although retroperitoneal dissection was significantly associated with colonic stasis. In the study by Wilson, it is interesting that narcotics had no effect on postoperative gastrointestinal motility.

### Elimination of postoperative nasogastric decompression

In 1995 a meta-analysis combined 26 prospective randomized trials (class I) comparing postoperative nasogastric decompression with no postoperative nasogastric decompression after elective abdominal surgery in more than 3964 patients. One of the main reasons for establishing the traditional postoperative feeding protocol was to prevent vomiting to decrease the incidence of aspiration pneumonia. These studies have shown that withholding nasogastric decompression had no effect on emesis (10% vs 8%), although there were more instances of postoperative pneumonia in the nasogastric decompression group (6%) than in the no-treatment group (3%). The second purpose of the traditional postoperative feeding protocol was to prevent ileus to decrease the incidence of wound dehiscence and intestinal leaks. Withholding nasogastric decompression had no effect on postoperative dehiscence (0.6% vs 2%) or intestinal leaks (0.6% vs 8%). One hundred ten gynecologic oncology patients undergoing major abdominal surgery were randomized to nasogastric tube decompression or withholding of decompression. Although there was a significant incidence of emesis in the patients without nasogastric tube decompression (28%), there was no increase in aspiration pneumonia, wound dehiscence, or anastomotic leaks. Thus class I data have shown that nasogastric tube decompression is not necessary after elective major abdominal surgery. It should be noted that patients with bowel obstructions were excluded from these trials, and thus we cannot extrapolate these data to comment on the safety of withholding postoperative nasogastric decompression in patients operated on for bowel obstruction.

### Postoperative ileus (postoperative colonic stasis)

Postoperative ileus is defined as bowel distention, decreased bowel sounds, and delay of defecation after a surgical procedure. It is hypothesized that postoperative ileus is the result of postsurgical stress causing inhibition of normal small bowel peristalsis. Several prospective randomized and nonrandomized trials (classes I and IIA) have shown decreased postoperative motility of the large intestines in animals and man. Woods et al placed electrodes in the stomach, small bowel, and ascending colon and descending colon in monkeys. Myoelectrical activity of the intestine was observed at a baseline, after anesthesia, and after abdominal surgery. Anesthesia alone had little effect on intestinal motility; however, anesthesia with abdominal surgery caused a significant change in the motility of the intestine. The stomach and small intestines returned to normal activity within 8 hours. However, the right colon took 48 hours and the sigmoid colon 72 hours to return to normal contractility. Wilson performed a similar study in humans. The night before surgery 39 patients swallowed radiotelemeterizing capsules. Abdominal x-ray films the morning of surgery localized the transmitters in the right ascending colon. After abdominal surgery, normal right colonic activity was delayed for 48 hours. Although the term paralytic ileus is incorrect, because stasis of the ileum lasts for only 8 hours after operation, it is clear from these and other studies that significant rectosigmoid stasis persists for approximately 3 days after major abdominal surgery. These studies have shown that the length of the surgical procedure and the amount of intestinal manipulation had little effect on colonic stasis, although retroperitoneal dissection was significantly associated with colonic stasis. In the study by Wilson, it is interesting that narcotics had no effect on postoperative gastrointestinal motility.

### Challenging traditional postoperative feeding protocols

Two major trends in the late 1980s and 1990s have led to challenging the traditional postoperative feeding protocol. Originally, laparoscopy was restricted to diagnostic procedures and tubal sterilization. After laparoscopy, patients were fed immediately rather than according to the traditional postoperative feeding protocol. In the late 1980s and 1990s, major gynecologic and general surgical procedures were performed laparoscopically. Many physicians abandoned the traditional postoperative feeding protocol when these surgical procedures were performed laparoscopically rather than through a large abdominal incision. The second major impetus to challenging the traditional postoperative feeding protocol was managed care. Managed care’s insistence on early postoperative discharge challenged physicians to reevaluate the traditional postoperative feeding protocol.

### Table I. Evidence-based medicine

<table>
<thead>
<tr>
<th>Class</th>
<th>Type of trial</th>
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<tbody>
<tr>
<td>I</td>
<td>Prospective randomized clinical trial</td>
</tr>
<tr>
<td>IIA</td>
<td>Prospective nonrandomized clinical trial</td>
</tr>
<tr>
<td>IIB</td>
<td>Epidemiologic</td>
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<tr>
<td>III</td>
<td>Retrospective; expert opinion</td>
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## Evidence-based medicine

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Early feeding after major gynecologic surgery

In the late 1990s, two prospective randomized trials (class I) reported on the safety of early postoperative feeding after major gynecologic surgery. Schilder et al.7 randomized 96 patients to either early postoperative feeding or the traditional postoperative feeding protocol. Although early postoperative feeding resulted in a significant incidence of emesis (approximately 40%), there was no increase in aspiration pneumonia, wound dehiscence, or intestinal leakage. Length of hospital stay was reduced from 4 days to 3 days. Pearl et al.8 performed a similar trial of early feeding on 200 patients undergoing major gynecologic surgery. Similar to the trial of Schilder et al.7 Pearl et al.8 noted a significant incidence of nausea and emesis (49%) after early feeding. However, early feeding did not result in an increase in aspiration pneumonia, wound dehiscence, or intestinal leakage, and hospital stay was reduced from 6 days to 5 days. Thus class I data have shown that early feeding after major abdominal gynecologic surgery, although resulting in significant emesis, does not increase pneumonia, dehiscence, or anastomotic leaks and reduces hospital stay by approximately 1 day. Neither the studies on elimination of postoperative nasogastric decompression nor the reports on early feeding after major gynecologic surgery have scientifically evaluated patient satisfaction or cost analysis concerning postoperative emesis.

A question arises over the safety of early postoperative feeding in patients who have undergone intestinal anastomosis, enterotomy, or extensive enterolysis. In the study by Pearl et al.8 it is interesting that in the early feeding group 32% of patients underwent bowel resection and 20% underwent extensive enterolysis. Also, in the general surgical literature, there have been prospective randomized trials (class I) suggesting the safety of early postoperative feeding after elective bowel resection1 and nontraumatic intestinal perforation and peritonitis.9

Advancement of postoperative diet

In the traditional postoperative feeding protocol, after removal of the nasogastric tube, diet was initiated and slowly advanced from clear liquids to full liquids to soft diet to full diet. We were unable to locate class I data evaluating the safety or benefit of slow advancement of postoperative diet in patients undergoing major gynecologic surgery. However, a prospective randomized trial (class I) comparing immediate postoperative solid food consumption versus gradual advancement of diet was performed in 100 patients undergoing cesarean delivery. Although the group with immediate solid food consumption after cesarean delivery had a significant amount of emesis (22%), there was no increase in aspiration pneumonia or ileus. There was a small but statistically insignificant reduction in hospital stay from 3.7 to 3.3 days with early solid food consumption.10 It is our opinion (class III) that advancement of diet after major abdominal gynecologic surgery is probably unnecessary.

Minimal medical benefits of early postoperative feeding

Opinion (class III) and animal studies have theorized that early postoperative feeding can prevent gastrointestinal mucosal atrophy and preserve normal flora, thus resulting in improved wound healing and decreased sepsis. A meta-analysis reported on 130 patients randomized to early enteral versus parenteral postoperative feeding.11 Class I data from this meta-analysis revealed that early enteral feeding decreased postoperative septic complications. However, the benefit was a decrease in pneumonia and catheter sepsis in trauma patients requiring prolonged intensive care unit hospitalization. There is no evidence-based scientific medicine that has shown a medical benefit of early postoperative feeding after major gynecologic surgery. In a healthy gynecologic patient it is doubtful (class III) that 2 to 3 days without enteral nutrition would result in significant gastrointestinal atrophy or alteration of normal flora to the extent that delayed wound healing or sepsis would occur.

Postoperative bowel stimulation

Because retroperitoneal dissection increases colonic stasis,3, 4 radical hysterectomy should be associated with significant stasis because of the following: (1) Extensive retroperitoneal dissection is required (pelvic lymphadenectomy, periaortic lymph node sampling, ureterolysis, resection of cardinal ligament). (2) The neuronal pathways to the rectosigmoid are disrupted with resection of the uterosacral ligaments. In a prospective nonrandomized trial (class IIA), Barnes et al.12 evaluated 15 patients after radical hysterectomy. All patients had altered relaxation of the internal sphincter, increased distention needed to trigger relaxation, and decreased rectal sensation. In a prospective nonrandomized trial (class IIA), Fanning et al.13 showed that the median clinical return of normal bowel function required 3 weeks after radical hysterectomy. Prospective nonrandomized trials (class IIA) on aggressive postoperative bowel stimulation after radical hysterectomy,14, 15 as opposed to awaiting the natural resolution of rectosigmoid stasis after radical hysterectomy, have been reported. In the first trial Fanning and Yu-Brekke14 used 30 mL of milk of magnesia orally 2 times andbiscolic suppositories once as postoperative bowel stimulation on the first postoperative day. After return of bowel function, patients were started on a clear liquid diet and were discharged from the hospital 12 hours after tolerating a clear liquid diet. No patients had emesis, aspiration pneumonia, or ileus. Compared with previous studies using the traditional postoperative feeding protocol, hos-
hospital stay was reduced from 8 to 4 days with aggressive postoperative bowel stimulation. In a second prospective nonrandomized trial (class IIA) 15 20 consecutive patients were started on 45 mL of Fleet Phospho-Soda (C.B. Fleet Co, Inc, Lynchburg, Va) orally and a clear liquid diet on the first postoperative day after radical hysterectomy. Emesis, aspiration pneumonia, or ileus did not develop in any patients, and hospital stay was reduced to 3.5 days. Both of the studies 14, 15 contained a small number of patients, and therefore further experience needs to be obtained.

It is our opinion (class III) that postoperative bowel stimulation may also be of benefit after extensive lymphadenectomy and ovarian cytoreduction. We are aware of no data on the use of bowel stimulation after intestinal anastomosis, enterotomy, or extensive enterolysis.

Comment

According to evidence-based scientific medicine the following conclusions can be drawn: (1) Postoperative colonic stasis occurs after major abdominal surgery and persists for approximately 3 days (classes I and IIA). (2) Elective postoperative nasogastric decompression after major abdominal surgery is unnecessary (class I). (3) Early feeding after major gynecologic surgery results in emesis but does not increase the incidence of aspiration pneumonia, dehiscence, or intestinal leaks and decreases hospital stay (class I). (4) Slow advancement of postoperative diet after major gynecologic surgery is probably unnecessary (class III). (5) After major abdominal gynecologic surgery, there appear to be minimal medical benefits (decreased infection rate) of early postoperative feeding (class III). (6) After radical hysterectomy, postoperative bowel stimulation decreases length of hospital stay (class IIA).

REFERENCES