Complications of Hysterectomy

Daniel L. Clarke-Pearson, MD, and Elizabeth J. Geller, MD
(Obstet Gynecol 2013;121:654–73)

Question 1:

The complication rate for laparoscopic hysterectomy compared to open laparotomy is lower for some types of complications (infectious, for example) and higher for others, such as bowel injury. Is this discrepancy perhaps due to a cohort of older gynecologists incorporating a new and technically difficult procedure with a challenging learning curve, and do you foresee the relative complication rates changing as more recently trained practitioners with vastly increased experience in laparoscopic surgery (but substantially less experience in vaginal or even open laparotomy) enter the field?

Response from Drs. Clarke-Pearson and Geller:

The difference in risk profile between open and laparoscopic hysterectomy is most directly related to the route of the procedure rather than surgeon expertise. Visualization and haptic feedback are more limited in a laparoscopic procedure, thereby increasing the likelihood of sustaining a bowel injury that may go unrecognized at the time of surgery. However, there are also clear benefits to the laparoscopic route rather than open surgery, including decreased rates of pain, blood loss, length of stay, and wound infection. As experience with open, laparoscopic, and vaginal hysterectomy changes over time, we will likely see a shift in the comparative rates of surgical complications; but it is difficult to predict the direction of those changes. By whatever technique and route a hysterectomy is performed, basic surgical principles must be followed, including identifying relevant anatomy and careful technique (such as the appropriate use of electrosurgical power). Further, recognizing when a laparoscopic procedure should be converted to an open procedure requires good judgment as well as the skill to perform the open procedure.

Question 2:

You state that treatment of bacterial vaginosis (BV) can reduce the risk of cuff cellulitis; however, many women have evidence of asymptomatic BV (for example, as an incidental finding on cervical cancer screening cytology). Is there any benefit to routine preoperative evaluation for BV?

Response from Drs. Clarke-Pearson and Geller:

Soper et al demonstrated that BV increases the risk of postoperative cuff cellulitis. Larsson et al have reported that treatment of both symptomatic and asymptomatic BV will decrease the rate of postoperative vaginal cuff infection. Based on these two studies, ACOG Practice Bulletin No. 104 recommends treatment of any documented BV prior to
However, the bulletin does not go so far as to recommend preoperative screening. As with any screening test, its positive and negative predictive value are improved if the disease being screened for has a high prevalence. Therefore, it is reasonable to consider preoperative BV screening if your practice has a high prevalence of BV.

Question 3:

What recommendations do you have for avoiding postoperative ileus, or later bowel complications such as small bowel obstruction (SBO)?

Response from Drs. Clarke-Pearson and Geller:

General principles for avoiding postoperative ileus and SBO include decreased operative time, minimizing bowel exposure and manipulation, and slow advancement of diet balanced with return of flatus. While a nasogastric tube may decompress the stomach during surgery, it does not improve return of postoperative bowel function. Less invasive routes of hysterectomy, including laparoscopic and vaginal, will reduce some of these risks, but have the same risk of mechanical SBO due to bowel entrapment from suture or adhesion formation.

Question 4:

For diabetic patients, is there any benefit, in terms of decreased rate of infections or other complications, to aggressive management of blood glucose levels in the postoperative period? If so, how tightly should one control glucose levels, and for how long postoperatively?

Response from Drs. Clarke-Pearson and Geller:

The only published studies measuring the effect of glucose control on surgical site infection (SSI) pertain to cardiothoracic procedures. A case-control study of 114 patients found that a preoperative blood glucose level of 200 mg/dL or more had a tenfold increased risk of sternal site infection. A cohort study of 1,000 cardiac patients found a 2.5-fold increased risk of SSI with a postoperative glucose level of 200 mg/dL or more. These data only assessed the inpatient period, but it would be reasonable to aim for blood glucose levels of less than 200 mg/dL for the full 6-week postoperative course in diabetics. The risk of hyperglycemia in nondiabetic patients is low, unless there are extrinsic risk factors such as chronic steroid use.

Question 5:

With so many patients staying only 24 hours or less following hysterectomy, a concern exists that complications may be worsened by delayed evaluation or lack of recognition of potentially significant symptoms by patients and their families. For “early discharge” patients, when do you see these patients back in the office? Do you recommend nursing telephone follow up? What outpatient monitoring do you recommend to most effectively and promptly detect delayed complications?

Response from Drs. Clarke-Pearson and Geller:

Hospital discharge should occur once a patient has met all postoperative goals, whether that occurs several hours, overnight, or several days after the procedure. It is important to perform a thorough postoperative assessment for signs and symptoms of complications. Some complications develop late in the perioperative course, after patients have gone home. The best way to identify late-onset complications is to educate patients and their caregivers about specific signs and symptoms that should trigger a phone call to the doctor. These include fever, worsening pain, dysuria, incision site...
erythema or discharge, and vaginal bleeding that fills a peripad within 1–2 hours. We do not routinely see postoperative patients before 6 weeks postoperative unless they call with one of these complaints. While routine visits prior to 6 weeks are not necessary in the absence of symptoms, being available to evaluate patients on an as-needed basis is critical. We maintain a nurse advice line during office hours and an operator-based physician line 24 hours a day in order to triage patients for potential complications. All patients receive a nurse phone call 1–3 days after surgery as well.

**Question 6:**

Do you routinely perform cystoscopy at the conclusion of hysterectomy?

**Response from Drs. Clarke-Pearson and Geller:**

We do not routinely perform cystoscopy after an uncomplicated hysterectomy. However, we do perform cystoscopy under the following conditions: there is extensive bladder dissection (endometriosis, prior scarring from cesarean delivery); there are concomitant procedures that increase risk of injury (uterosacral ligament suspension, pubovaginal sling); or either air or blood is seen in the urimeter bag. A study of cost-effectiveness of universal cystoscopy at time of hysterectomy found that the procedure was cost-saving when the rate of ureteral injury was at least 1.5% for abdominal hysterectomy and 2% for laparoscopic and vaginal hysterectomy, which is consistent with published rates. Therefore it would be reasonable to routinely perform cystoscopy after hysterectomy. We would recommend performing cystoscopy whenever the surgeon has any suspicion for a genitourinary tract injury, with intravenous administration of indigo carmine (2.5–5 mL total) to confirm ureteral patency. It is a 5-minute procedure which is low risk and may identify complications that, if unrecognized, would result in severe morbidity.

**Question 7:**

Can you comment on “tucking” the arms during laparoscopic hysterectomy, and on the avoidance of brachial plexus and other upper extremity nerve damage and other injuries? Is tucking the arms beneficial for the patient?

**Response from Drs. Clarke-Pearson and Geller:**

The primary benefit of arm tucking during laparoscopic surgery is that it allows greater range of instrument rotation and surgeon ergonomics both for straight-stick and robotic-assisted laparoscopy. A secondary benefit is that it decreases the risk of a lower brachial plexus injury that may occur with arms on arm boards at a 90-degree angle to the body. Tucking does not prevent an upper brachial plexus injury, which can occur from pressure on the upper nerve roots (which may occur with shoulder blocks), nor does it prevent an ulnar neuropathy with compression in the ulnar groove near the elbow. Therefore shoulder blocks should be well-padded, as should the elbows prior to tucking.

**Question 8:**

Can you comment on maintenance of normal body temperature in the prevention of postoperative morbidity?

**Response from Drs. Clarke-Pearson and Geller:**

Normothermia has been shown to decrease the incidence of SSI, likely due to avoiding the vasoconstriction associated with hypothermia. A randomized study of 200 patients undergoing colorectal surgery found a significant increase in the rate of postoperative SSI (19% compared with 6%) with average postoperative temperature of 34.7°C in the group with hypothermia and 36.6°C in the group with normothermia. Therefore, warming measures, such as a forced-air warming cover, warmed intravenous fluids, and warmed irrigation should be used to maintain normothermia.
Question 9:
Can you comment on surgical techniques that might decrease the rate of wound seroma or infection with open laparotomy? Specifically, would you address the use of electrocautery for tissue dissection, closure of the subcutaneous layer in obese patients (including suture material, size and technique), and the ever-contentious skin staples compared to subcuticular sutures?

Response from Drs. Clarke-Pearson and Geller:
Principles of surgical technique include hemostasis, irrigation, gentle tissue handling, small surgical pedicles, and tension-free incision closure. Electrosurgery can lead to tissue dessication and devascularization, both of which can impair wound healing. It is a known risk factor for vaginal cuff dehiscence. Electrosurgery should be used sparingly and on the lowest possible settings.

Elimination of subcutaneous tissue dead space at the abdominal incision site, especially when that layer is at least 2 cm in depth, has long been thought to decrease subsequent wound complications. However recent data have not supported this theory. One gynecologic and one obstetric randomized trial each compared three scenarios: 1) subcutaneous suture closure, 2) drain placement, or 3) neither; and demonstrated no difference in the rate of wound complications or wound disruption. Maintaining the surgical principles listed above is most likely to prevent a wound complication. If subcutaneous closure is performed, a small fast-absorbing suture, such as a 3-0 monocryl or catgut should be used. These materials will maintain closure of dead space and relief of incisional tension for several weeks, with less risk of forming a nidus for infection due to faster absorption.

Wound closure can be performed with nonabsorbable staples or sutures. A recent randomized trial of 398 patients comparing the two techniques for cesarean wound closure found that staples were 2.5 times more likely to develop a wound disruption or infection (14.5% versus 5.9%). A 2012 Cochrane Database Systematic Review of eight randomized trials found no difference in rates of wound infection after cesarean delivery, but staples were associated with an increased risk of skin separation. A randomized trial of 90 patients undergoing laparotomy for gynecologic surgery found no difference in wound complications between staples and sutures. Because there is no definitive answer for abdominal hysterectomy wound closure, surgeon preference is reasonable.

References: