GENERAL GYNECOLOGY

Transumbilical versus transvaginal retrieval of surgical specimens at laparoscopy: a randomized trial

Fabio Ghezzi, MD; Antonella Cromi, PhD; Stefano Uccella, MD; Giorgio Bogani, MD; Maurizio Serati, MD; Pierfrancesco Bolis, MD

OBJECTIVE: We sought to compare transumbilical (TU) and transvaginal (TV) route for retrieval of surgical specimens at laparoscopy.

STUDY DESIGN: Women scheduled for a laparoscopic resection of an adnexal mass were randomized to have their surgical specimen removed either through a posterior colpotomy (n = 34) or the umbilical port site (n = 32). Group allocation was concealed from patients and bedside clinicians. The primary outcome was postoperative incisional pain assessed by a 10-cm visual analog scale at 1, 3, and 24 hours after surgery.

RESULTS: TV retrieval caused less postoperative pain than TU specimen extraction at each time point (visual analog scale score at 1 hour: 2.6 ± 2.9 vs 1.2 ± 2.0, $P = .03$; at 3 hours: 2.4 ± 2.0 vs 1.4 ± 2.0, $P = .02$; and at 24 hours: 1.1 ± 1.5 vs 0.5 ± 1.4, $P = .02$). A higher proportion of women in the TU group than in the TV group indicated the umbilicus as the most painful area at 1 and 3 hours postoperatively. Two months after surgery, the participants scored similarly as to their overall satisfaction, cosmetic outcome, and dyspareunia upon resumption of intercourse.

CONCLUSION: A TV approach for specimen removal after laparoscopic resection of adnexal masses offers the advantage of less postoperative pain than TU retrieval.

Key words: adnexal mass, laparoscopy, ovarian cyst, specimen removal, transvaginal

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With the firm establishment of laparoscopic surgery in current gynecologic practice, ongoing efforts are now focused on developing strategies to further reduce incisional morbidity and improve the cosmetic outcomes. Abdominal wall incisions are a significant source of postoperative complications including pain, infection, and incisional hernia.[1,2]

With the advent of a laparoscopic approach to advanced surgical procedures, specimen removal has become a legitimate concern since in most cases of laparoscopic resections, specimens that are to be extracted are originally larger than the port sites.[3] Often the trocar incision is therefore enlarged at the beginning of the extraction procedure. However, an excessive wound enlargement, as well as stretching and tearing of the fascia during the passage of tissue through the port site, may result in the abolition of known advantages of laparoscopic surgery.[4] Studies focused on perioperative outcomes related to the surgical wound showed that complications at the specimen extraction site account for the vast majority of laparoscopic wound complications.[2,5]

One solution is to avoid the enlargement of a trocar incision by the use of natural orifices, such as the umbilicus or the vagina, to extract the specimen. We have earlier reported our experience with a routine policy of surgical specimen retrieval through the umbilical incision in a series of >1000 women undergoing laparoscopic gynecologic procedures for a pelvic mass.[6] Gynecologic surgeons have used a transvaginal (TV) access to the peritoneal cavity via a posterior colpotomy for decades both for diagnostic and extirpative procedures. TV route for retrieval of surgical specimens was first described >100 years ago in the gynecologic literature,[7] but this approach fell into disuse with the introduction of laparoscopy into clinical practice. The reasons why TV extraction of the specimen fell out of favor include perceived technical difficulty, potential for infectious complications, concerns about patient acceptance, and unknown effects on future sexual function. Paradoxically, with the development of natural orifice specimen extraction[8] technique as a bridge to natural orifice transluminal endoscopic surgery,[9] the vagina has emerged as the preferred extraction site for a variety of specimens and extrapelvic organs among surgeons of several nongynecologic specialties.[10,11]

The ideal technique of tissue extraction at laparoscopy surgery has not been given much attention in the gynecologic literature, though minimizing abdominal wall trauma may be desirable not only to improve the short-term benefits of minimal access surgery, but also to limit the high health and financial cost of wound complication management. Therefore, we decided to design a randomized trial to compare transumbilical (TU) and TV route for retrieval of surgical specimens in women with adnexal masses undergoing operative laparoscopy.

From the Department of Obstetrics and Gynecology, University of Insubria, Varese, Italy.

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Reprints: Fabio Ghezzi, MD, Department of Obstetrics and Gynecology, University of Insubria, Piazza Biroldi 1, 21100 Varese, Italy. fabio.ghezzi@uninsubria.it.

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MATERIALS AND METHODS

This study was conducted in the Department of Gynecology at the University of Insubria from September 2011 through February 2012. Sexually active women found to have an adnexal mass who were scheduled for a laparoscopic procedure were invited to take part. All patients had an ultrasound investigation performed before surgery to evaluate the morphology and size of the adnexal mass. Exclusion criteria were preoperative suspicion or intraoperative diagnosis of malignancy or deep infiltrating endometriosis, indication for concomitant hysterectomy, intraoperative diagnosis of complete obliteration of the pouch of Douglas, and virginal status. Preoperative suspicion or intraoperative findings of endometriomas or pelvic adhesions were not considered as exclusion criteria. We did not set an upper size limit to the adnexal masses that could be removed laparoscopically.

The study was approved by the Azienda Ospedaliero-Universitaria Ospedale di Circolo, Macchi Foundation, Ethics Committee and all participants gave written informed consent. The trial was registered in http://ClinicalTrials.gov (NCT01418807). Women who entered the study were randomized to have the surgical specimen removed either through the umbilical port (TU) or TV, through a posterior colpotomy.

Randomization

Suitable patients were randomized to have their surgical specimen removed either TV or through the umbilical port site (TU) using a computer-generated randomization list. This list was held centrally by a trial administrator. Randomization was carried out by telephone. The patient was assigned by the principal investigator to treatment group TU or TV according to the randomization. Once allocated, the treatment was revealed to the surgeon immediately prior to starting the procedure, while group allocation was concealed from patients and bedside clinicians. An opaque sterile dressing was applied postoperatively over the skin wounds to prevent women from looking at their incisions size.

Operative technique

Operative laparoscopy was performed under general anesthesia in all women. Standard anesthesia and perioperative care protocols were used. After the pneumoperitoneum was created (using a Veress needle), a 0-degree 5-mm laparoscope (Karl Storz, Tuttlingen, Germany) was introduced through the umbilicus. Two or three 3-mm ancillary trocars were inserted under direct vision in the lower abdomen. One 3-mm trocar was always inserted in the midline approximately 3-6 cm above the symphysis. The other trocars were inserted under laparoscopic vision laterally to the lateral umbilical ligament. Instrumentation included graspers, scissors, monopolar electrocautery, a bipolar PK System MoLly Forceps (Gyrus Medical Inc, Maple Grove, MN), and suction–irrigation. Pelvic washing for cytological examination was performed whenever needed. Tissue evacuation was always performed using specimen retrieval bags (EndoCatch II, Tyco Healthcare Group LP, Norwalk, CT). Preemptive infiltration of trocar sites or colpotomy site with a local anesthetic was never performed.

TU specimen removal

When the surgical specimen was freed, the laparoscope was then withdrawn from the umbilical trocar. The 5-mm umbilical port was replaced with a 10-mm port to allow insertion of the specimen bag. A specimen retrieval system was then disbanded to split the specimen pouch from the dispensing tube but not from the 40-cm long thread. To facilitate introduction of the retrieval bag into the peritoneal cavity, the bag was rolled up and with the help of a grasper was blindly introduced into the abdominal cavity through the umbilical port, leaving the thread of the specimen pouch protruding from the trocar, with the free end held outside the abdomen. The laparoscope was then reintroduced alongside the thread. Once in the peritoneal cavity, the bag was opened with laparoscopic atraumatic graspers and the surgical specimen was inserted under direct vision. Then, the free end of the thread was withdrawn pulling the bag into the trocar, and this was then removed together with the umbilical trocar. If the surgical specimen was too large to pass through the umbilical incision, or solid components were encountered, the mouth of the sac was brought out with the help of atraumatic graspers, and the specimen was carefully morcellated using Kocher clamps and scissors inside the bag to avoid intraabdominal spillage or loss of surgical debris. Even in the presence of large adnexal masses, gentle traction on the bag during the process allowed serial exteriorization of the bag, keeping the cyst components at the incision. In case of large cystic tumors, puncture of the mass and aspiration were performed within the retrieval bag. In the worst-case scenario the port site was expanded for specimen removal. During this procedure, an ancillary trocar served as the gas delivery port to avoid loss of the pneumoperitoneum. Umbilical incisions were closed with a short-term synthetic absorbable suture, while 3-mm wounds were approximated with adhesive skin closure strips.

TV specimen removal

The specimen retrieval device is introduced in the vagina and is gently pushed against the vaginal wall to define the posterior fornix between the uterosacral ligaments. A 1-cm length transverse TV posterior colpotomy was performed under laparoscopic control using a 3-mm monopolar hook set at 60W.

Grasping the bag orifice with ring forceps through the colpotomy, the specimen was then pulled into the vagina. The bag orifice was opened inside the vaginal canal and the specimen was delivered through the vagina. The vaginal opening was irrigated with a povidone-iodine solution. The colpotomy was closed TV with a running 2-0 synthetic medium-term reabsorbable braided and coated suture.

Operative times were recorded from first incision to last suture. Time for specimen retrieval was calculated from TU bag insertion to TU bag removal (TU group) and from insertion of the specimen retrieval device into the vagina to the end of colpotomy closure (TV group).