


MINIMALLY INVASIVE GYNECOLOGIC SURGERY

EVIDENCE-BASED LAPAROSCOPIC, HYSTEROSCOPIC AND ROBOTIC PROCEDURES

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Contents

Chapter 2 Exposure in laparoscopic surgery

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INTRODUCTION

In the past few decades the use of laparoscopic surgery has grown exponentially. During this time, smaller scars with faster and improved recovery time have turned laparoscopy into the gold standard approach for use in both gynecological procedures and other surgical specialties. Today, we know that one of the greatest benefits of laparoscopic surgery is image magnification, which has increased both the knowledge of anatomy and our understanding of different disease processes (Pierre et al. 2009). With the development of high-resolution cameras, the ability to differentiate structures previously unseen during surgery has been realized. Furthermore, with the introduction of 3D technology, depth perception is now possible (Storz, et al. 2012, Tanagho et al. 2012).

As minimally invasive techniques and instruments have evolved so, too, has the surgeon's ability, allowing for more complex procedures to be performed laparoscopically. These types of surgeries are associated with a higher morbidity rate, although this may be related to the surgeon's inexperience. If a specific strategy is adhered to, it can simplify the procedure and potentially minimize complications. The assimilation of these simple gestures into surgical procedure can be called exposure. Exposure in laparoscopy is obtained through a combination of steps that maintain the surgical field while freeing up the assistant. The requirements of these individual steps can vary and should be tailored accordingly. They can be divided into preoperative and intraoperative exposure techniques.

PREOPERATIVE EXPOSURE TECHNIQUES

Bowel preparation

The debate regarding preoperative bowel preparation and its effect on postoperative morbidity is ongoing. Mechanical bowel preparation prior to colorectal surgical procedures has long been an ingrained practice among surgeons. The rationale for evacuation of fecal content was that it lowered the risk of contamination of the abdominal cavity, thus resulting in fewer infectious complications following surgery (Hughes 1972). This has been challenged in the medical literature, and, in a Cochrane Review with 4599 patients, it was demonstrated that in patients who did not undergo bowel preparation there was no difference in rates of anastomotic leakage, mortality, peritonitis, reoperation, or wound infection (Guenaga et al. 2011). Most of the papers included in the review were related to open surgery; only a few were related to laparoscopy (Bucher et al. 2005, Bretagnol et al. 2010, Moral et al. 2009). These authors suggested that the effect of gravity on fecal matter within the bowel may provide a better surgical overview.

Principles of dissection should be respected, and the surgeon should search for embryological spaces existing between structures so as to maintain an avascular plane. In laparoscopy, the surgeon is often obliged to work with small, delicate instruments, and specific traction and countertraction movements are adopted to facilitate precise dissection. A bowel void of fecal and gaseous content is easier to handle and place above the promontory, free of the pelvis, thereby improving surgical access and exposure. For low-complexity procedures, a low-residue diet between 5 and 7 days preoperatively is sufficient. In deep endometriosis, where bowel surgery may be necessary, we recommend an enema the night before the surgery (Wattiez et al. 2013), whereas colorectal surgeons suggest an additional enema 2–3 hours prior to surgery. When a segmental resection is performed, the proximal segment of the transected bowel usually needs to receive the anvil in order to anastomose the distal segment of the transected bowel using a circular stapler. This can be performed by enlarging one of the port sites or performing a mini laparotomy using a 5 cm Pfannenstiel incision (Wattiez et al. 2013). In the past few years, a novel concept called natural orifice specimen extraction (NOSE) was introduced that enabled colorectal surgeons to reduce the risk of hernias, infection, and pain while improving aesthetic results (Diana et al. 2011, Palanivelu et al. 2008). Using this technique, the specimen is extracted through the anus or vaginally, in cases where a posterior culdotomy is performed due to endometriotic infiltration.

INTRAOPERATIVE EXPOSURE TECHNIQUES

Exposure strategy

Independent of the complexity of the surgery, the formulation of a surgical strategy remains an important step and should always be observed. Not all exposure techniques need to be adopted during surgery; however, they should be carefully selected because they will influence and will be influenced by the surgical strategy.

Exposure strategy begins with patient positioning, Trendelenburg positioning, and tailored placement of the trocars, all of which can have a significant influence on the surgical procedure. Patient positioning can contribute to an adequate intraoperative exposure. For example, positioning the arms alongside the body will allow the surgeon to move freely and contribute to his or her own ergonomy. Also, positioning the bottom of the pelvis 4 cm away from the table will increase uterine manipulator movements and pelvic structure exposure.

Depending on the case, trocars can be rearranged to give the surgeon better access. Following placement of the 10 mm umbilical trocar and visualization of both the upper and lower abdomen, the patient is placed in Trendelenburg and three additional 5 mm trocars are placed in the lower abdomen, two in the right and left iliac fossas in a range no greater than 2 cm from the anterior iliac spines and a third toward the midline. It is of significant importance for the ergonomy of the surgeon that the middle trocar is at the same level as the lateral

trocars or slightly above it, respecting the 8 cm distance from the optical trocar (Wattiez et al. 2013). With this arrangement of trocars the surgeon benefits from an ergonomic positioning with access to the entire pelvis and lower abdomen. Once inside the abdominal cavity, after confirmation that no entry complications have occurred, it is important to gather information and perform a thorough inspection of the abdominal cavity.

Abdominal inspection

The first assessment of the pelvis should include a systematic and detailed anatomical survey. At this point, any kind of surgical act without a correct recognition of the operating field can lead to inadequate dissection, bleeding, and increased rates of complications (Chapron et al. 1998). High-complexity cases like deep endometriosis and patients with numerous previous surgeries usually present with scattered implants, adhesions, and distorted anatomy that requires careful recognition of organs and structures (Chapron et al. 2003).

The inspection should start by ruling out upper abdominal adhesions or endometriotic implants that may explain patient symptoms (Ceccaroni et al. 2013). Looking toward the pelvis, the assessment begins with recognition of the bladder, uterus, adnexa, and bowel, and subsequent structures that allow for identification of important landmarks for dissection. In cases of adhesions, the bowel is often attached to the uterus and left adnexa. The Trendelenburg sequence is used at this time to displace the cecum and small bowel from the pelvis. It is of utmost importance that any kind of dissection in cases where the anatomy is distorted should commence where the tissues and organs are normal and not obscured by disease.

The Trendelenburg sequence

Friedrich Trendelenburg revived a Middle Age habit by placing his patients in lithotomy position. The elevation of the pelvis he described was later assigned his name in 1988 by Mendes de Leon in a publication of pelvic laparotomies and gynecological examination (Cassidy et al. 2014). Trendelenburg defended his eponymous position because it provided better access to intravesical and intraperitoneal procedures mainly by diminishing the local blood supply and also by increasing exposure.

When associated with the Trendelenburg position, the pneumoperitoneum, which makes laparoscopic procedures possible, can lead to cardiorespiratory parameter changes. Findings include decrease in the functional residual capacity and respiratory compliance, increase in respiratory resistance, impairment of arterial oxygenation and increase in dead space (Andersson et al. 2005, Chui et al. 1993, Soro et al. 1997). In a prospective study with 22 patients who underwent laparoscopy for gynecological purposes, the Trendelenburg position was maintained at between 30 and 50° and a pneumoperitoneum pressure of between 12 and 15 mmHg. These changes contributed to a reduction of 44.4% in the compliance of the respiratory system and an increase in expiratory airway resistances of 29.1% (Llorens et al. 2009).

Gasless and low-pressure techniques have been described; however, it has been reported that they can decrease surgical exposure and, as such, should be avoided in high-complexity cases. For ideal exposure during comprehensive laparoscopic surgery of the pelvic floor laparoscopies require the pneumoperitoneum to expand the working area and the Trendelenburg position to free the pelvis from the cecum and small bowel. For cardiorespiratory purposes, a combination of both maneuvers should, at a minimum, always be attempted and a specific sequence should be followed. Attention should be paid to the patient's position throughout the procedure, because of the risk that the patient may slide upward with increased Trendelenburg angles. Shoulder pieces placed at the beginning of the procedure can prevent this.

With 15 mmHg of pressure and a 30° Trendelenburg, the surgeon manipulates the bowel beginning with the cecum through to the last ileal loop with a well-coordinated sequence of repeated movements. At this point, adhesions that limit the mobility of the colon and small bowel should be removed. Once the bowel is reclined out of the pelvis, the pressure is reduced to 12 mmHg. The last step involves the reduction of the Trendelenburg angle and should be performed with direct vision of the promontory and the pelvic brim; angle reduction should stop just before the bowel starts to descend toward the pelvis.

Uterine manipulation

The pelvis contains numerous structures. Ligaments, vessels, and nerves surround the uterus, bladder, and bowel in a concentric pattern. Unlike the bladder and bowel, the uterus lies in a central position in the pelvis and has a thick wall, making it the perfect pelvic organ for manipulation.

There are numerous types of uterine manipulators on the market, each with differing properties and characteristics. Whether it is for simple procedures or extensive endometriosis cases, there are numerous examples where the uterine manipulator can be useful. The correct exposure of the surfaces and spaces surrounding the uterus during laparoscopic hysterectomy can reduce operating time and minimize complications, especially in cases of an enlarged uterus, adhesions, and deep endometriosis (David-Montefiore et al. 2007). With the uterine manipulator correctly in place, a second assistant standing between the legs of the patient plays a key role during the surgery by moving the uterus in a three-dimensional axis within the pelvis, thus allowing exposure of all important structures (Nakamura et al. 2013).

Moving the uterus posteriorly provides access to the anterior compartment, where both paravesical spaces are found laterally, and the bladder, Retzius space, and anterior uterine wall are found centrally. By placing the uterus anteriorly, the surgeon exposes the posterior compartment, thus making accessible both pararectal fossas laterally, the sigmoid, rectum, and vagina, as well as the rectovaginal space and the posterior wall of the uterus. Lateralization of the uterus allows access to the lateral uterine wall and the adnexa, and to both paravesical and pararectal fossas with all the structures that lie beneath the peritoneum: ureters, vessels, nerves, and nodes.

In addition to the anterior, posterior, and lateral displacement of the uterus, a fourth possibility is craniocaudal movement. Extremely useful, the cranial displacement of the uterus should always be applied in combination with other movements prior to any lateral or anteroposterior movement. Particularly, this maneuver increases the distance between the ureters and the uterine arteries, thus diminishing the risk of ureteral injuries when performing laparoscopic hysterectomies. All these specific movements should be performed in combination and not alone.

The use of uterine manipulation in oncological cases has been extensively discussed (Lee et al. 2013). It is well known that for detailed and precise dissection during nerve-sparing procedures, exposure of the paravesical and pararectal fossas is of particular importance, and, in these instances, the uterine manipulator plays a key role. Some authors warn that the use of the uterine manipulator could increase the risk of introducing malignant cells into the abdominal cavity. In response, some companies have recently developed blunt-tipped manipulators with a backstop security device

that diminishes the risk of perforation. Some experts recommend the coagulation of both tubes prior to the placement of this type of uterine manipulator.

The detachment of the sigmoid

The division of the sigmoid from the lateral wall (**Figure 2.1**) allows mobilization of the bowel and access to the left ureter, iliac vessels, infundibulopelvic ligament, and the beginning of the pararectal fossa (**Figure 2.2**). For optimal dissection, the sigmoid at the level of the left pelvic brim must be retracted at a 90° angle away from the pelvic sidewall using an atraumatic forceps. This maneuver reveals a smooth white line that represents the cleavage plane between the peritoneal fold of the sidewall and the sigmoid, the meso-sigmoid peritoneum. The peritoneum should be divided immediately medial to this line using cold scissors, traction, and countertraction while maintaining hemostasis when necessary. These actions will unfold the sigmoid from the pelvic sidewall, revealing the iliac vessels, ureter, and infundibulopelvic ligament on the left pelvic brim. By using the same divergent forces medial to the ureter, an avascular space with a bubbly champagne appearance caused by CO_2 is identified, revealing the entrance to the pararectal fossa.

Ovarian suspension

Ovarian suspension was reportedly first performed by laparotomy in 1970, in a patient receiving radiotherapy for Hodgkin's disease (Ray et al. 1970). The advent of laparoscopic surgery brought about the possibility of ovarian transposition using a minimally invasive approach. Several reports have described laparoscopic oophoropexy as a means of protecting the ovaries from subsequent pelvic irradiation in oncological cases (Tulandi & Al-Took 1998).

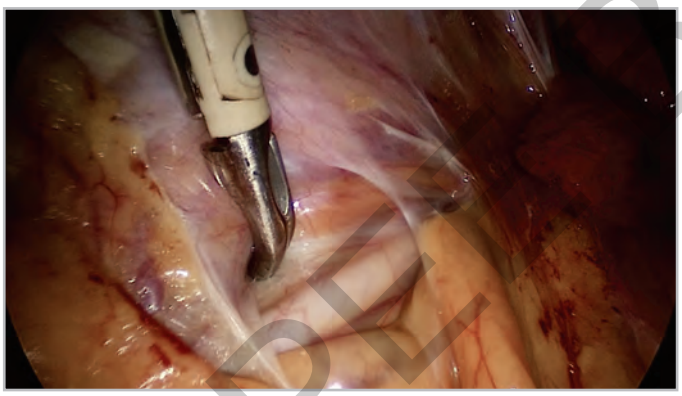

Figure 2.1 Sigmoid physiologic detachment with a view of the left ureter.

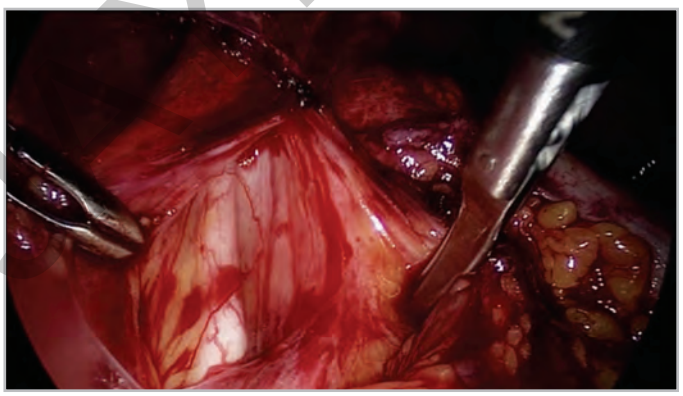

Figure 2.2 View of the ureter at the left pelvic brim and the entrance of the left pararectal fossa medially.

Similar techniques have been advocated to reduce postoperative adhesions, as observed by Abuzeid et al. (2002) when they found that temporary suspension of the ovaries for 4–7 days could accomplish this goal. The anatomical position of the adnexa frequently hides access to the pelvic sidewall (Chapman et al. 2007). During deep endometriosis cases, during which the peritoneum of the ovarian fossa is often compromised, a careful retroperitoneal dissection should be performed to identify the path of the ureter and determine whether it is involved by the disease (Cutner et al. 2004). To overcome these difficulties, bilateral suspension of the ovaries permits an optimal exposure of the ovarian fossa (Wattiez et al. 2013).

The technique involves a grasper, which is introduced from the same side on which the ovarian suspension is to be performed. A straight needle on 2-0 polypropylene is inserted perpendicular to the skin and under direct vision lateral to the obliterated umbilical ligament. The inferior epigastric vessels are visualized and avoided. A needle holder is introduced from the port on the contralateral side and grasps the straight needle. The ovary is presented to the straight needle by the grasper on the same side. The needle is the passed through the center of the ovary and is picked up again by the needle holder. Then the needle changes direction, 180° toward the skin, and exits close to the site of insertion. The needle is cut, and the suture is tied to the abdominal wall to enable exposure. Abuzeid et al.'s conclusion was that the technique normally takes less than 5 minutes to be completed on both sides, and, once performed, results in considerable overall time saving during the remainder of the surgery. No injuries were encountered using this method, and anatomy was restored at the end of the procedure. Abuzeid et al. caution that long needle manipulation can be difficult and sometimes dangerous inside the abdomen.

One important advantage of this technique is the possibility of leaving the thread loose on the abdominal wall instead of locking the suspension with a knot. The thread is clamped with forceps over a gauze at the level of the puncture sites thus allowing the surgeon to change the tension on the ovary and thus its position inside the abdomen by simply pulling or releasing the monofilament thread, which allows it to slide smoothly through the tissue.

In 2007, Chapman described a new technique, performed intra-abdominally, with an extracorporeal knot. He used a 75 cm, 2/0 polyglactin suture with a curved needle passing through both ovaries and taking deep bites of the ovarian tissue. Then, with the uterus placed posteriorly, a Roeder knot was performed, positioning both ovaries at the midline over the anterior surface of the uterus. After the procedure, the knot was released and the ovaries returned to their anatomical position. One caveat for this technique is that it can slightly displace the position of the ureters along the pelvic sidewall, so the ureters must be traced before surgery.

Chapman concluded that this maneuver adds only a few minutes to the total operating time, and the view of the pelvic sidewall was judged to be excellent. It was noticed that bleeding at the suture site after removal of the ovarian sutures was minimal. A variation of this technique explores the possibility of attaching the ovaries to the round ligaments, taking care to avoid the vessels of the infundibulopelvic and broad ligament. By performing an intracorporeal single stitch that passes through the ovarian tissue and then through the round ligament bilaterally, both adnexa will remain fixed and will accompany the movement of the uterus. The selection of absorbable suturing materials can also allow the suspension to be left in place at the end of the surgery. This may permit the inflamed dissected area to heal just before the suture is reabsorbed and the adnexus returns to its anatomical position, thus reducing the risk of adhesions. To achieve

this objective, the use of a monofilament (poliglecaprone 25) 4-0 that will lose 70% of its strength in 2 weeks is recommended to allow time for the ovarian and peritoneal tissues to heal without direct contact between them.

Any laparoscopic surgeon who treats endometriosis appreciates that it is often awkward to operate on the pelvic sidewalls because of the position of the adnexa. The ability to temporarily elevate the adnexa without having to rely on continuous instrumentation offers obvious benefits.

Under the same principle as that described by Cutner et al. (2004), a suspension device was developed to achieve ovarian suspension without having to maneuver straight needles inside the abdomen (**Figure 2.3**). This device consists of a T-shaped insert in a metallic cutting tip sheath and a lock system. The sheath, loaded with a bent T-shape, passes through the abdominal wall and the ovary to be suspended, being careful not to go through the hilum. The plastic device is then pushed inside until its arms open up in a T shape configuration and its body can be grasped. At this point, the inserter is retrieved, the device is adjusted either to a T or J shape, and it is gradually pulled, bringing the adnexa away from the posterior pelvis. Before external locking is performed, variable exposure can be applied according to the needs of the case. At the end of the surgery, the T-shaped device can be cut and removed in two pieces or grasped by the thick arm of the T and pulled out completely (Wattiez et al. 2014). The proposed unpublished advantages of this device are that it is safe, user-friendly, and time-saving with no reported major complications.

Bowel suspension

In certain situations, such as pelvic organ prolapse, deep endometriosis cases, and in obese patients, the position of the bowel may prevent the surgeon from performing an optimal procedure. Suturing techniques or suspension devices can be used to temporarily attach the bowel to the abdominal wall, thus exposing the operating field, giving it a steady position, and keeping the surgeon's assistant free and active for the most important steps. This suspension can be performed by means of straight needle sutures or suspension devices. The place of fixation on the anterior wall should be well-studied and planned in advance by the surgeon. This step is of utmost importance to the surgery because distinct spots of attachment can result in different exposure angles in which centimeters can sometimes make a great difference. The best places of anchorage for suspending the bowel are the epiploical appendices, of which more than one can be used for optimal suspension. The bowel should be displaced by the surgeon or the assistant until the place of attachment on the anterior wall is selected. Maintaining this position, the optic centers the view on the desired area of dissection to inspect if that point of attachment permits good exposure.

Suspension with straight needles can be challenging. Maneuvering a long straight needle inside the peritoneal cavity can be dangerous and should be performed with care. The needle is introduced through the abdominal wall at the chosen point. The surgeon passes the needle through the epiploical appendices and targets the exit point. At this moment, the assistant moves the bowel along with the suspension to diminish tension and the chance of breaking the attachment.

Fixations with specific suspension devices were introduced a few years ago and spare the surgeon from using straight needles inside the pelvis. The T shape of the plastic device is bent and introduced into the inserter. It is introduced through the epiploical appendices, at which point the surgeon pushes the plastic device forward, making the folded-down T open. For the same reasons explained earlier, the assistant moves the bowel toward the wall while the surgeon pulls the device and fixes it.

Colposacropexy procedures require dissection of the right border of the promontory, continuing medially to the right ureter towards both pararectal fossas. This is one of the most important and delicate steps, where the surgeon deals with the bifurcation of the iliac and the sacral vessels. The combined action of both surgeon and assistant to lift the peritoneum decreases the risk of damaging these vessels and helps to respect the optimal depth of dissection. For a good exposure of this area the sigmoid must be fixed laterally toward the left anterior wall, close to Palmer's point (**Figure 2.4**). Following the same principles, the assistant is also required to help by exposing the right ovarian fossa and the dissection of the puborectalis muscle (Gabriel et al. 2011). At the end of the procedure, peritoneal closure over the dissected area must be performed to cover the mesh. Bimanual coordination of the surgeon facilitated by the exposure of the field and maneuvering of the thread by the assistant are essential to a good hermetic suturing procedure.

Deep endometriosis procedures often require coordinated work between assistant and surgeon. Cases in which bowel attachment to the anterior wall is performed are not common but can be done depending on the judgment of the team. If necessary, the bowel should be attached higher than the optic trocar and closer to the midline, thus permitting both the left and right ovarian and pararectal fossas to be accessed.

The greater abdominal pressure and the higher quantity of fatty tissue in obese patients create a complicated environment. The angle of Trendelenburg positioning is limited due to the risk of cardiovascular problems during anesthesia. Therefore, the small bowel and

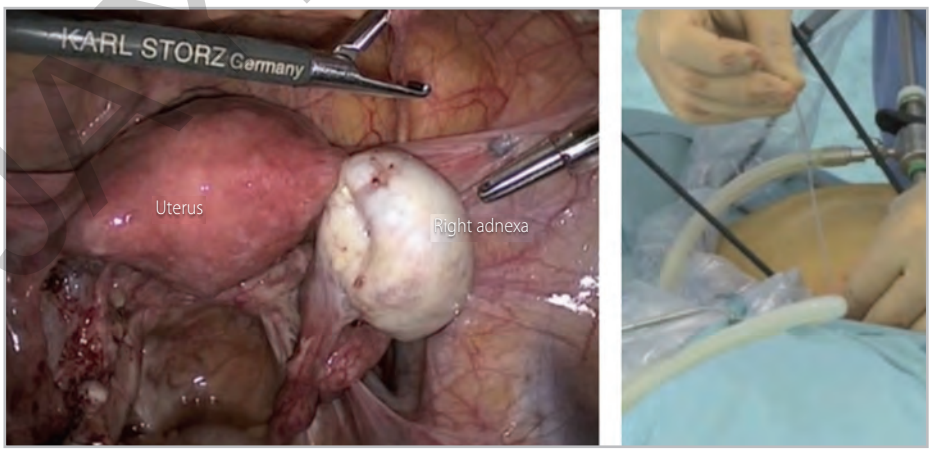

Figure 2.3 Ovarian suspension with exposure of the posterior aspect of the pelvis and ovarian fossa.

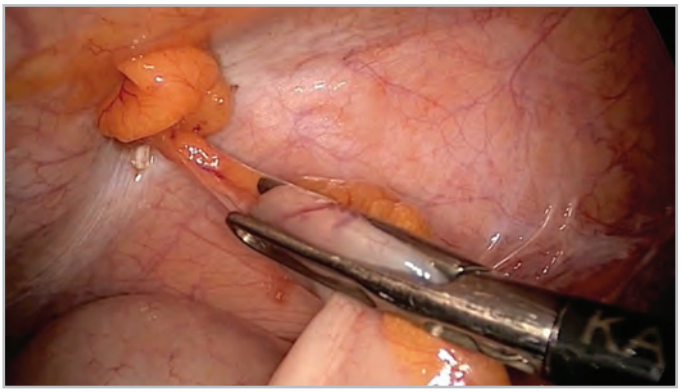

Figure 2.4 Bowel suspension with attachment to the upper left quadrant of the abdominal wall for a colposacropexy procedure.

the sigmoid colon can frequently interfere in the pelvis, impairing the view and the dissection field and sometimes being the reason for conversion (Walker et al. 2009). The use of suspension techniques sigmoid on the sigmoid and maneuvers to pack the small bowel can keep these structures in the upper abdomen.

Cervical suspension

Laparoscopic colposacropexy is the standard technique for pelvic organ prolapse (POP) repair (Gabriel et al. 2011). Vaginal erosion is one of the most frequent complications after POP repair procedures (Deffieux et al. 2012). The literature suggests that to avoid this kind of complication, surgeons should perform supracervical hysterectomy on patients undergoing colposacropexy (Barber et al. 2009). In some cases, access to the rectovaginal space can be challenging to obtain, and the surgeon may need time for careful dissection. At this point, cervical suspension can be performed by a suture exteriorized at the level of the suprapubic region using a thread recovery device, thus exposing the site and facilitating dissection of the posterior compartment while allowing the assistant to be more efficient during the main surgical steps (**Figure 2.5**). In addition, because the cervix has to be closed by a suture placed laparoscopically, this suture can also be used as a temporary cervical suspension with the aim of easing the placement of the posterior mesh.

Uterine suspension

In cases contraindicatory to the use of uterine manipulation, as in virginal patients or when the manipulator is unable to offer optimal anterior displacement, uterine suspension can be helpful to improve exposure of the posterior compartment of the pelvis (**Figure 2.6**). This procedure allows better dissection of the rectovaginal space during deep endometriosis or prolapse surgeries, provides access to posterior wall myomas and facilitates various suturing techniques. The technique consists of introducing a straight needle suture through the pelvic abdominal wall right above the pubis, attaching it at the fundus of the uterus and returning it to the anterior wall. It is suggested that the thread not be knotted, thus allowing for the suspension to be adjusted at any time. A second option uses suspension by the round ligaments by means of straight needles or suspension devices.

Figure 2.5 Cervix suspension to the anterior abdominal wall exposing the posterior compartment of the pelvis.

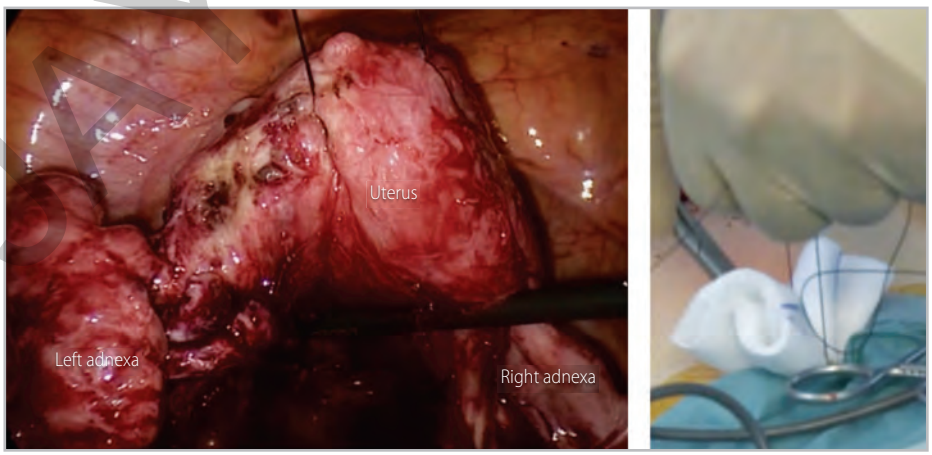

Figure 2.6 Uterine suspension to the anterior abdominal wall by means of a thread.

Peritoneal suspension

Laparoscopic oncologic procedures such as lumboaortic lymphadenectomy often put the surgeon close to delicate structures and vital areas. Depending on the indication, the surgeon needs access to the retroperitoneum from the pelvic brim up to the level of the left renal vein (Medeiros et al. 2013). Both the small bowel and the colon can impair the surgeon's vision; therefore, suspension techniques for exposure are extremely important.

The aim of suspension in this case is to expose the aorta, vena cava, and surrounding retroperitoneal structures that maintain the bowel cranially and laterally. Walker et al. (2009) described lack of exposure as one of the main factors contributing to conversion when performing pelvic or para-aortic lymphadenectomy. The peritoneum is lifted and incised in a longitudinal aspect. By means of suspension devices or sutures with straight needle, the peritoneum is temporarily attached in more than one spot on each side, allowing an adequate view of the retroperitoneal space and producing almost a barrier or natural retractor (**Figure 2.7**). In this way, the surgeon is free to focus on the careful dissection technique required during this procedure, and the assistant is completely active when needed (Kumar et al. 2014).

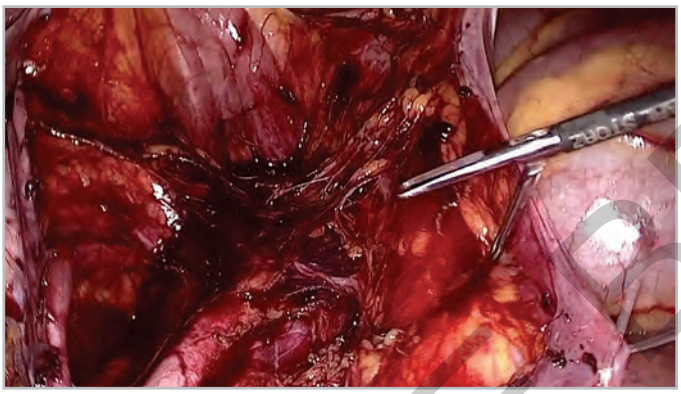

Figure 2.7 Abdominal retroperitoneum and exposure of para-aortic spaces by means of suspender devices.

NOSE procedures

NOSE procedures were first described in 1991, when David Redwine performed a transanal specimen extraction for bowel endometriosis (Redwine & Sharp 1991). In 1993, a fully laparoscopic colectomy with transanal specimen extraction and anvil introduction was performed (Franklin et al. 1993). Following the same principle, similar reports of specimen extractions were also reported via a transvaginal incision (Gill et al. 2002).

The benefits of the NOSE procedure, apart from the lower rate of pain, surgical site infection, and incisional hernia, include the aesthetic aspect because the patient is spared from an enlargement of a lateral port or an abdominal incision. This technique not only requires that both the vagina and rectum remain open to receive the specimen but also that a precise combination of organ manipulation and logistics inside the pelvis be undertaken between the surgeon and the assistant. At this point, a suture or a suspension device can be used to keep organs open, leaving the assistant free to help the surgeon (**Figure 2.8**). This type of exposure is more often applied in transanal NOSE procedures but can also be used when transvaginal specimen extractions are performed.

PERIOPERATIVE INSPECTION

Structures and organ suspension are extremely helpful but should be performed with care. After their removal, all sites where suspension needles or devices were placed should be carefully inspected for bleeding, which can lead to postoperative intra-abdominal hematoma.

CONCLUSION

Laparoscopic surgery contributes not only to better recovery and more aesthetic-looking scars but also allows the surgeon to see better and more clearly, which changes the way we face and deal with

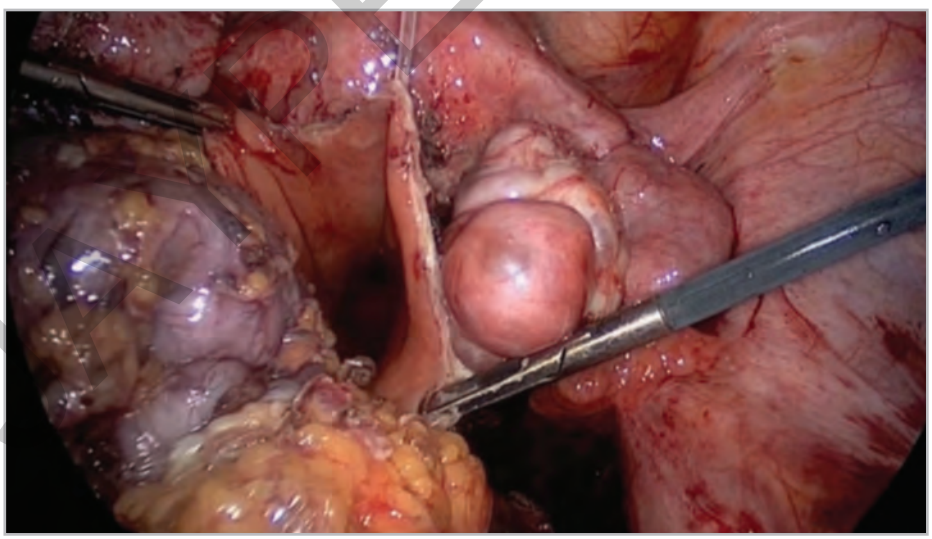

Figure 2.8 Suspender device maintaining the rectum open for specimen extraction.

the human anatomy. The limitation of working in small spaces and dealing with complicated situations obliges the surgeon to use his or her creativity to develop skills and to apply specific strategies for all surgeries. Exposure is a key factor to the success of laparoscopic procedures, whether they are simple or complex. There is no clear evidence published in the literature proving that exposure methods can improve operative time or bring safety and quality to the procedure. Numerous exposure acts can be performed during a single surgery, but not all are necessary. This is why the strategy of exposure should be tailored to the strategy of the surgery in order to to profit most from it.

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