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Laparoscopic hysterectomy

A preliminary study

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Summary. Thirty-three patients were selected for laparoscopic hysterectomy and operated on in the Department of Obstetrics, Gynecology and Reproductive Medicine of Clermont-Ferrand University Hospital. Surgical techniques included blunt dissection with scissors and bipolar coagulation to achieve hemostasis. A case was considered successful when all the uterine vessels were treated by laparoscopy. Twenty-four cases were completed laparoscopically (72.7%). None of these patients had postoperative bleeding; 22 had an uneventful postoperative recovery. Nine procedures were converted to laparotomy (27.3%), five because of a difficult or unsatisfactory hemostasis. We conclude that in selected cases, a total hysterectomy can be performed safely by experienced laparoscopists. Further technological progress is necessary to make this procedure more acceptable. Its value as compared to the others will have to be demonstrated.

Key words: Laparoscopic surgery – Hysterectomy

Laparoscopic surgery is widely accepted for the treatment of adnexal diseases such as ectopic pregnancy, adnexal cysts, and pelvic endometriosis [3, 12, 14, 16, 17]. The limit of this new surgical approach has yet to be defined, and it is clear that complex procedures such as lymphadenectomy and hysterectomy can be performed using this technique [4, 15, 18, 20]. By avoiding abdominal incision, hospital stay, postoperative recovery, and the associated costs can be reduced. However, the safety of these procedures should be confirmed in larger studies, and their indications have to be defined. We present here our current technique for laparoscopic hysterectomy and preliminary results.

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Patients and methods

Under endotracheal general anesthesia, a Foley catheter was placed in the urethra, a curette inside the uterus, and two tenaculums on the cervix. The pneumoperitoneum was created with a Veress needle and a 10-mm incision was made on the lower margin of the umbilicus. A 10-mm laparoscope connected to a video camera was used during the entire procedure. A routine panoramic inspection of the entire peritoneal cavity was performed, looking for unexpected associated pathology. Thereafter the patient was placed in the Trendelenburg reverse position, which varied between 10° and 15°. Two second-puncture trocars were inserted on the suprapubic line lateral to the epigastric vessels. A third 5- or 10-mm second-puncture trocar was placed on the midline 3 cm above the suprapubic line. Thereafter, the pelvis was inspected and as in laparotomy, the sigmoid or abnormal bowel adhesions were blunt dissected with scissors to obtain a perfect exposure of the pelvis. All the bowel was pushed above the superior pelvic brim, it was then generally possible to reduce the Trendelenburg position to 10° or less.

During the dissection of the adnexa, the uterus was pushed toward the opposite pelvic side wall using the uterine cannula. Several techniques have been used to achieve the infundibulopelvic ligament hemostasis. The situation of the ureter was confirmed either by inspection of the superior margin of the pelvis or by dissection. Bipolar coagulation with or without previous skeletonization of the vessels was used in most cases; two or three applications were necessary to achieve a complete hemostasis. Endoclips (Ethicon, Sommerville, NJ) applied after skeletonization of the vessels (two cases) and Endoloops (Ethicon, Sommerville, NJ) (one case) have also been used. Following scissors division of the ovarian vessels, the remainder of the broad ligament and the round ligament were sequentially coagulated and cut. When the adnexae were preserved, the tube and the utero-ovarian ligament were coagulated and transected without previous skeletonization. The round ligament was treated similarly.

Thereafter, the uterus was pushed toward the promontorium. The vesico-uterine peritoneum was grasped with an atraumatic forceps and opened with scissors. The vesical peritoneum was then pulled up using one or two grasping forceps placed laterally to the uterine vessels. The vesicovaginal space was developed using scissors and bipolar coagulation.

The uterine vessels were then dissected laterally to the uterine isthmus. To obtain a better exposure the uterus was pushed toward the opposite pelvic side wall, and in some cases it was twisted clock- or counterclockwise. Hemostasis was achieved with bipolar coagulation. Endoclips were used in three cases. The procedure was then completed using an intrafascial technique [9]. A transverse incision 1–2-mm deep was performed on the anterior and the posterior surface of the uterine isthmus, and the cervicovaginal vessels were coagu-

Table 1. Indications for laparoscopic hysterectomy

	N	%
Menometrorrhagia	15	45.5
Myoma	6	18.2
Chronic pelvic pain	2	6.0
Adenomatous hyperplasia	6	18.2
CIN III (after a conization)	4	12.1

lated and cut inside the fascial cuff. In most cases, the sacro-uterine ligaments were treated similarly; however, it was sometimes necessary to cut them before the incision of the fascia to allow an easier dissection of this space. The section was always as close as possible to the uterine cervix. During the dissection of the cervicovaginal vessels, the left, anterior, right, and posterior surface of the cervix were treated sequentially. The vagina was then desinfected again and a probe, usually a wet sponge, was placed in the anterior vaginal cul-de-sac. The vagina was opened by using a unipolar electrode and electric cutting current. The vaginal incision was completed either vaginally or laparoscopically. The uterus was removed and the vaginal cuff sutured, by the vaginal route. An extensive peritoneal lavage and a careful pelvic inspection were performed, checking for any bleeding. The pelvic peritoneum was left open. The normal peristaltism of both ureters was routinely checked. As is the usual treatment in our department for total hysterectomy, all the patients received prophylactic antibiotics (ampicillin + β^- lactamase inhibitor, 3 g/day).

Whenever the procedure appeared to involve risks which would overcome the potential advantages of laparoscopy, or when a complication occurred, the procedures were converted to a standard laparotomy with a transverse abdominal incision. Each operation was performed by two of the authors.

Included in this study, between September 1989 and March 1991, were 33 patients who would otherwise have been operated by laparotomy. Three patients had had a cesarean section; 26 patients had never had an operation. The mean age was 44 ± 1 years. The mean weight was 62 ± 2 kg. The indications are listed in Table 1. Patients with severe dysfunctional uterine bleeding were operated on following an unsuccessful endometrial ablation or because they refused this procedure and elected to undergo total hysterectomy.

Some of the results were compared with data from 50 uncomplicated total abdominal hysterectomies performed during the same period of time (nonrandomized study). In laparoscopy, blood loss is almost impossible to evaluate, since we do not know how much fluid is still in the upper abdomen after a careful aspiration of the peritoneal cavity. Therefore, the blood loss was approximated from the comparison of a preoperative and a 48-h postoperative hemoglobin assay. The first 10 patients were managed cautiously and were routinely hospitalized for 6 days after the procedure.

Results

Twenty-four cases were treated by laparoscopy (72.7%) (laparoscopic group); nine required conversion to a standard laparotomy (27.3%). In 5 cases (15.2%), the hemostasis was unsatisfactory or too difficult to be achieved safely, and open hysterectomy was performed (uterine vessels three cases, 9%, cervicovaginal vessels two cases, 6%). In two cases, we were unable to expose one of the uterine pedicles. One patient had a large uterus (445 g) which obstructed the view of the right uterine vessels. In the second case, a large myoma of the broad ligament (7 cm) precluded the dissection of the left pedicle. In one patient the anterior vaginal cul-de-sac could not be identified with certainty and a laparotomy was performed. One patient with two previous cesarean sections, sustained a bladder laceration, which was recognized and treated by laparotomy.

In the laparoscopic group, six patients had a bilateral adnexectomy. The mean uterine weight was 162 ± 22 g. The mean operating time was 149 ± 7 min (range from 55 to 190 min), significantly longer than in patients operated on by laparotomy (63 ± 11 min). The mean blood loss was 2 ± 0.2 gHb/100 ml, similar to that observed after laparotomy (2.4 ± 0.3 gHb/100 ml). Twenty-two of the patients with laparoscopy had an uneventful postoperative course. One patient had a second laparoscopy for diagnosis of a small-bowel occlusion on the second postoperative day. We found an abnormally inserted sigmoid. The left part of the sigmoid mesentery was absent, allowing the formation of an internal hernia between the left pelvic side wall and the sigmoid which was fixed on the peritoneal incision by postoperative adhesions. The adhesiolysis was performed by laparoscopy; the recovery was thereafter uneventful. One patient was readmitted on postoperative day 8 for parenteral therapy of a cuff cellulitis. Using broad-spectrum antibiotics, a normalization of the clinical symptoms was obtained within 36 h. After laparoscopic hysterectomy, the mean hospital stay was 4.8 days (range 3–7 days), not significantly shorter than after laparotomy (6.8 days), as a result of the management of the first 10 patients. All the patients operated by laparoscopy resumed normal physical activity within 2 weeks after the procedure, whereas the delay was 1 month after laparotomy. This difference was mainly explained by the absence of abdominal incision and associated pain. The mean duration of follow up is 11 months (range 3–21 months); thus far we have observed no delayed urologic complications or vaginal prolapse.

In patients who required conversion to a laparotomy, the mean laparoscopic operating time was 117 ± 15 min (45–180 min), the mean blood loss was 3.1 gHb/100 ml, the mean uterine weight was 191 ± 54 g, all not significantly different from the values observed in the laparoscopic group. None of the laparotomies was performed as an emergency procedure because of acute bleeding. The bleeding was always less important than assumed laparoscopically. Hemostasis was achieved using an extrafascial technique, as is usual in our department. We also observed that by laparoscopy, we tended to begin the coagulation too far from the uterine edge and below the uterine isthmus. All these patients had uneventful postoperative recovery and follow-up.

Comment

This preliminary study demonstrates that in selected cases, a laparoscopic hysterectomy can be performed safely by experienced laparoscopists. The lack of experience in laparoscopic hysterectomy of the six surgeons involved partly explains the high failure rate (27.3%). However, we encountered several technical problems, the hemostasis of large vessels — particularly the uterine and the cervicovaginal veins — being the main one.

As we observed no postoperative bleeding, we think that bipolar coagulation is safe. Similar results were reported by Reich for laparoscopic oophorectomy [19]. In our opinion, the coagulated area should be about 1 cm long when this technique is applied to large vessels. Since large bipolar forceps and long time application are required, bipolar coagulation should be considered as a powerful instrument which may induce thermal damage to surrounding structures, such as the ureter or the bowel. To avoid these risks, the uterine vessels should be coagulated lateral to the uterine isthmus, as close as possible to the uterus. Furthermore, the exact situation of the bipolar must be checked carefully, using a panoramic view of the pelvis and taking into account the lateral deviation and the rotation applied to the uterus. The five cases with difficult or unsatisfactory hemostasis were converted to laparotomy mainly because of the potential thermal damage when we were assuming that a complete dissection of the distal ureter was required to achieve a safe hemostasis. Although we have performed this dissection during laparoscopic radical hysterectomies [4, 13], we thought that the risk of postoperative ureteral complications [2, 11, 23] overcame the potential advantage of laparoscopic surgery, and managed these patients by laparotomy.

Bipolar coagulation is time-consuming, since several applications are often necessary and it may be difficult to ensure that complete coagulation of the tissue is achieved. According to Reich, this last problem may be avoided using an ammeter [21]. Although it is efficient and safe when used properly, bipolar coagulation does not appear to be a perfect instrument for dealing with large uterine vessels, especially in patients with enlarged uteri. New staple devices, such as the endo GIA [15] and endosuture with a curved needle, are currently under development and will hopefully avoid these problems. The clips actually available are certainly useful, but they do not fulfill all the requirements for a safe and quick hemostasis of the uterine vessels.

Laparoscopic hysterectomy should be reserved for normal-sized or slightly enlarged uteri. In one of our patients, it was impossible to see the right uterine vessels because of the uterine volume. As a large uterus can only be slightly moved laterally, the view of the uterine pedicle was obstructed by the uterine fundus.

Laparoscopic hysterectomy should be performed only by experienced laparoscopists working with nurses and anesthesiologists trained extensively in laparoscopic surgical procedures. We are convinced that the success rate and the operating time will significantly improve as we gain experience in this technique and new instruments become available. This progress will make laparoscopic hysterectomy much more acceptable. However, its value as compared to vaginal hysterectomy will still have to be demonstrated. Several of the potential advantages of laparoscopy over the conventional abdominal approach, such as reduced physical stress, hospital stay, and economic costs, are well-known advantages of vaginal surgery [6, 22]. Actually, a comparison of the two techniques is not possible, since the first laparoscopic hysterectomy was performed only 3 years ago [20], whereas the vaginal technique has been constantly improved for many years [1]. Considering the progress of laparoscopic surgery in the treatment of adnexal diseases during the last 10 years, any conclusion would be premature. The fact that more than 70% of the hysterectomies in women of reproductive age are performed by laparotomy [7, 24] argues in favor of the usefulness of the laparoscopic approach in current gynecologic practice. In our opinion, laparoscopic surgery is already a powerful instrument in the arsenal of the vaginal surgeon, allowing him to perform many procedures such as ovarian inspection, bowel adhesiolysis, adnexectomy, and pelvic lymphadenectomy. As a matter of fact, several different methods of performing laparoscopically assisted vaginal hysterectomy have been or may be proposed. For instance, laparoscopic diagnosis before vaginal hysterectomy has been reevaluated recently [10]. Laparoscopic surgery may also be used to perform bowel adhesiolysis or difficult adnexectomies, to extend the indications of vaginal surgery. In contrast and as in the present report, Reich et al. and Nezhat et al. have described the laparoscopic hemostasis of all the uterine vessels with and without laparoscopic suture of the vaginal cuff [15, 20]. We have adopted the following definitions of "laparoscopic vaginal hysterectomy": type 0, diagnostic laparoscopy and vaginal hysterectomy; type 1, laparoscopic hemostasis of the adnexal vessels and vaginal hysterectomy; type 2, laparoscopic hemostasis including the uterine vessels; type 3, laparoscopic hemostasis of all the uterine vessels; type 4, laparoscopic closure of the vaginal cuff. All the patients reported here would have been classified type 3. Large, prospective, randomized studies will be necessary to establish the indications and the advantages of these new approaches.

Because of these developments, total hysterectomy reappears as a modern procedure, obscuring the fact that most hysterectomies can be avoided by using either medical treatment or endometrial ablation [8]. During this study we have performed more than 100 endometrial ablations. We have not yet changed our indications because of the development of laparoscopic hysterectomy. This also needs to be investigated, but all the nonsurgical and hysteroscopic methods are efficient [5] and far less expensive than any laparoscopic or surgical technique. Actually, most hysterectomies are indicated either for treatment of large myomas or for uterine cancer. Large myomas can not be managed laparoscopically or vaginally; we are currently evaluating the latter indication [4, 13].

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