

# Total laparoscopic radical hysterectomy (type III) and pelvic lymphadenectomy

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## Summary

A case of Stage IIA, G2 carcinoma of the cervix treated by total laparoscopic radical hysterectomy and pelvic lymphadenectomy is reported. To our knowledge, a total laparoscopic radical hysterectomy with laparoscopic lymphadenectomy has not been previously described in Italy.

*Key words:* Laparoscopy; Radical hysterectomy; Pelvic lymphadenectomy.

## Case Report

A 69-year-old woman was admitted several days before surgery for baseline studies consisting of history and physical examination, routine preoperative laboratory investigation, chest X-ray, and magnetic resonance imaging of the abdomen and pelvis.

Examination revealed a large excavation on the cervix involving the left fornix. Colposcopic examination was satisfactory and findings were consistent with dysplasia. An area with atypical vessels suspicious for invasion was noted. Multiple biopsies revealed squamous cell carcinoma of the cervix.

Magnetic resonance of the pelvis revealed a 3 x 3 cm area involving both the lateral fornices and the upper-third of the vagina. Based on these results, the patient was assigned to FIGO Stage IIB.

Physical examination revealed a healthy woman, 5 feet 4 inches tall, weighing 210 pounds, with no history of surgical operations.

Neoadjuvant chemotherapy was performed; in fact the woman was included in a multicentric randomised study of neoadjuvant chemotherapy (SNAP-01).

The preoperative examination revealed a soft lateral fornix, a cervix without blood loss and parametria, paravaginal and uterosacral ligaments without neoplastic involvement.

A standard bowel preparation was used as was antibiotic prophylaxis with 2 gm/day cefoxitin intravenously one day before surgery and one hour preoperatively.

The procedure was performed under general endotracheal anesthesia. The patient was placed in the dorsolithotomy position with arms tucked at her side in a 15-degree Trendelenburg position. The vaginal cavity was cleansed with povidone-iodine solution and a Foley catheter was placed in the bladder. After dilation with a Hegar dilator (no. 7), a uterine manipulator (Clermont Ferrand, Storz) was inserted. Laparoscopic equipment included a 3 CCD camera (Stryker) attached to a 10 mm laparoscope (0°) (Stryker) with xenon light source 4000 Quantum (Stryker), one videomonitor (21" Sony), a high-flow CO<sub>2</sub> insufflator (40 liters/min, heated, Stryker), two 10 mm and two 5 mm trocars (Wolf); suction and irrigation system (Wolf), bipolar coagulation (Kleppinger, Wolf), endoclinch (Autosuture), endoshears (Autosuture), endobag (Autosuture) and

suture materials. The pneumoperitoneum was established. Three suprapubic access routes were used: one 5 mm in the midline and one in each iliac fossa (5 mm on the left side and 10 mm on the right size). A 10-mm laparoscope was inserted through an umbilical incision and connected to a video monitor. Before the operative procedure, all pelvic structures were inspected and the abdomen explored through the laparoscope in a clockwise fashion.

Peritoneal washings (50 cc) were obtained and the cytological examination revealed no malignant cells. Adhesions were seen around the uterus and ovaries. Adhesiolysis was performed and the recto-sigmoid was mobilized.

The right round ligament was coagulated until desiccated close to the pelvic wall with bipolar forceps and transected with endoshears.

The anterior and posterior leaves of the broad ligament were opened. The pararectal and paravesical spaces were developed by blunt dissection.

Dissection of the paravesical space was aided by introducing a suction irrigator probe and bipolar clamps in the areolar tissue between the bladder and the obliterated hypogastric arteries.

The pararectal space was developed by peeling apart the leaf of the broad ligament, making a small opening in the dense areolar tissue at the base of the broad ligament, and insinuating the suction irrigator probe and the bipolar clamps in the pararectal space, between the recto-sigmoid and the uterosacral ligament.

The retroperitoneum was opened upward to the level of the aortic bifurcation and down to the level of the uterosacral ligament posteriorly. External iliac vessels were separated from the psoas muscle, and the external iliac artery was freed from its fascial sheath and separated from the underlying vein. External and common iliac lymph nodes were removed from vein surfaces by blunt or sharp dissection. The ureter was identified at the pelvic brim, traced into the pelvis, and freed from the posterior leaf of the broad ligament.

The obturator fossa was entered laterally and fatty nodal tissue mobilized to identify the obturator nerve and vessels. Obturator lymph nodes were removed as corresponding vessels and nerve were skeletonized. This bundle of tissue was freed initially by dividing its distal attachments, and the dissection continued along the internal iliac artery. The right common iliac nodes with the right pelvic nodes were removed by endo-bag

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Fig. 1

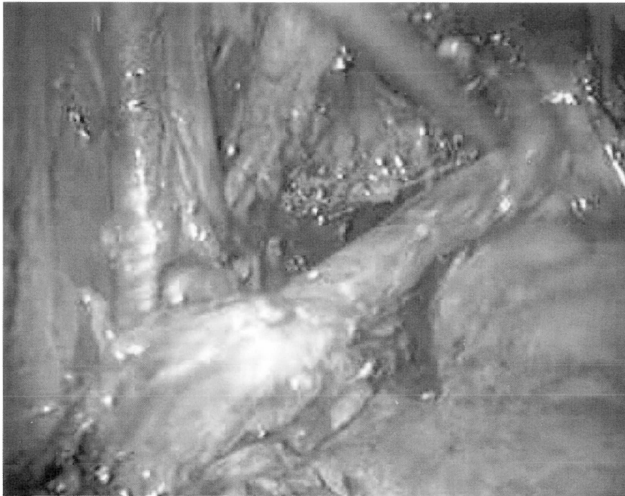
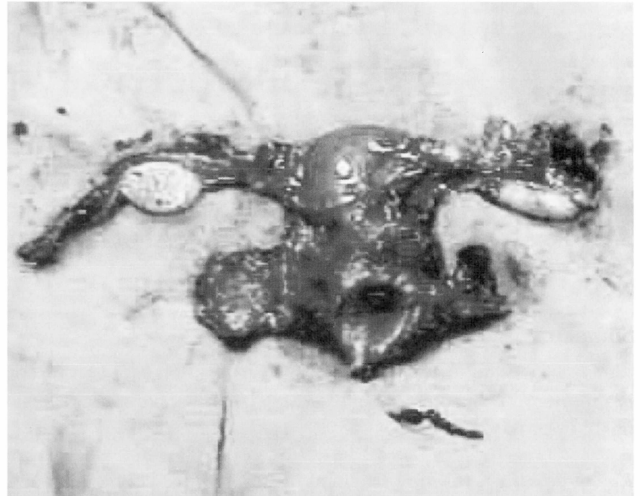
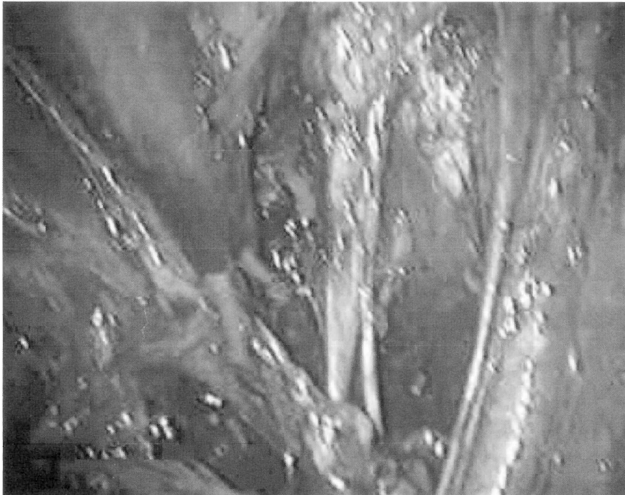


Fig. 3



and the histologic examination by frozen section was negative for malignant cells.

The uterine vessels were identified allowing an excellent skeletonization of the obliterated hypogastric artery by preparing the anterior and posterior web. The uterine artery was coagulated and transected at its origin from the internal iliac artery (Figure 1). A similar procedure was undertaken to transect the uterine vein. The ureter was identified and mobilized further.

The right infundibulopelvic ligament was coagulated with bipolar forceps and divided with scissors. The same procedure was performed on the opposite side.

The ureter was freed from the posterior leaf of the broad ligament down to the level where it entered the ureteral tunnel (Figure 2). Introducing bipolar forceps and separating the jaws of a grasping forceps aided the dissection. The roof of the ureteral tunnel was transected. At this point the lateral parametrium was coagulated and transected approximately 2 or 3 cm lateral to the cervix. The same procedure was performed on the opposite side.

The posterior parametrium was coagulated and transected approximately 5 cm posterior to the cervix (PIVER III). The vesicouterine fold was grasped and incised while the bladder was isolated: after dividing the vesicouterine fold, the suction-irrigator probe pushed the bladder completely from the cervix and upper vagina.

The anterior parametrium was delineated, coagulated and tran-

Figure 1. — The right uterine artery was coagulated and transected at its origin from the internal iliac artery.

Figure 2. — The left ureter is freed down to the level of the point where it enters the bladder.

Figure 3. — The ovaries, the parametria and the upper-third of the vagina were removed vaginally.

sected near the bladder (PIVER III). Incising the vagina circumferentially using the porcelain-valve of the uterine manipulator as a guide completed the radical hysterectomy. The upper-third of the vagina was visualized and the vaginal cuff was transected 3 cm under the areas suspicious for neoplastic invasion.

The uterus, the ovaries, the parametria and the upper-third of the vagina were removed vaginally (Figure 3). The vaginal vault was closed with continuous locking sutures of 1-0 chromic Byosin (USSDG sutures, USA) placed transvaginally. The pneumoperitoneum was re-established with CO<sub>2</sub> and laparoscopic control of hemostasis was performed.

Subsequently the patient received 5 ml methylene blue intravenously followed by a cystoscopy 15 minutes later to evaluate ureteral function by confirming ureteral patency.

The procedure lasted three hours with an estimated blood loss of 300 ml. The patient began eating within 48 hours and was discharged on the fifth postoperative day.

The final pathologic examination of the removed uterus revealed a cervix with irregular, neoplastic invasion of 4 x 3 cm. The measurements of the parametrial tissue were 4 x 3 x 1 cm. The anterior vaginal area was of 4 x 1 x 0.6 cm and the posterior vaginal area was of 4 x 2 x 1 cm. Parametrial and vaginal margins were negative for neoplasia.

The total number of lymph nodes removed was 36. Of the obturator fossa nodes removed, 13 were on the right and four on the left; the largest was 1.5 cm and total tissue measured 4

3 x 2 cm. Of the 18 iliac nodes removed, eight were from the right and ten from the left; the largest was 2.5 cm and the total measurement was 4 x 3 x 3 cm. All lymph nodes were negative.

The measurement from the lower portion of the vaginal cuff to the superior portion of the uterine fundus was 7.5 cm, and the uterine fundus was 4 x 2 cm wide. The hysterectomy specimen weighed 130 g. Based on these results the stage was pT2a, pN0, pM0.

#### Addendum

Since submitting this article, another laparoscopic radical hysterectomy with pelvic node dissection has been performed on a 43-year-old patient with Stage IB squamous cell carcinoma of the cervix. Forty pelvic nodes were removed and the duration of the procedure was 2.45 hours. She was discharged on the fifth postoperative day.

Follow-up was based on (nuclear magnetic resonance) NMR, colposcopy and gynecological examination one month after surgery and pelvic ultrasonograph with pap tests every four months. The patient is doing well one year after the operation and shows no sign of recurrent malignancy.

#### Discussion

The challenge to extend the laparoscopic technique to perform surgical interventions previously accomplished only by laparotomy continues worldwide. Within this decade a major breakthrough occurred when it was demonstrated convincingly that an adequate retroperitoneal lymphadenectomy could be accomplished safely through the laparoscope [1-3]. Details of pelvic anatomy are clearly visible with laparoscopy.

Laparoscopic radical hysterectomy with pelvic lymphadenectomy has been described [4-6]. The number of lymph nodes removed, the size of parametrial tissue margins, and the width of the vaginal cuff are equal to those achieved by laparotomy.

The operative time was substantially longer than with the abdominal operation, but blood loss and hospital time were significantly decreased and costs were quite similar. Morbidity from the laparoscopic procedure should be less than with conventional techniques. Complications associated with laparoscopic radical hysterectomy with pelvic lymphadenectomy seem acceptable.

The estimated blood loss in our cases (300 ml) compares favorably to that reported for abdominal radical hysterectomy [7-11].

Kim and Moon [5] reported on a series of 18 patients undergoing total laparoscopic radical hysterectomy. In that series the average length of the procedures was approximately six hours. Spirtos et al. [6] reported on ten patients undergoing the same procedures. The average operative time was 253 minutes. The length of the procedures in our cases was approximately three hours, which is shorter than in Kim and Moon's series [6] and Spirtos et al.'s cases [7]. However, operating time is also lengthened by equipment failure and lack of experience. It should also be noted that if other laparoscopic experiences hold true, it is only reasonable to expect that the time required to perform these procedures will decrease as our experience increases.

We did not perform paraaortic lymph node dissection but dissected up to the level of the common iliac lymph nodes because the prevalence of paraaortic nodal metastasis in patients with early invasive cervical carcinoma is less than 1% [12], a risk that does not match the risk of paraaortic node sampling. However, in our cases the pathologic examination by frozen section of the resected pelvic lymph nodes was negative for malignant cells. Paraaortic node dissection should be performed only in cases with positive iliac lymph nodes.

The number of pelvic lymph nodes resected compares favorably with that reported in Kim and Moon's [5] and Spirtos et al.'s series [6].

Surgical margin were clear in both patients and there were no major intra-operative complications involving injury to the major blood vessels, nerves, bowel, bladder, or ureters.

Several questions remain unanswered and can only be addressed by further reports. Before fair assessment of morbidity from operative laparoscopic radical hysterectomy with pelvic lymphadenectomy can be made, more experience with similar cases is necessary. Certainly these cases have been demonstrated to be technically feasible with an acceptable risk. Only time with more experience in centers devoted to expert training in this technique will show if this operation can become commonplace in the future.

#### References

- [1] Querleu D., Leblanc E., Castelain B.: "Laparoscopic lymphadenectomy in the staging of early carcinoma of the cervix". *Am. J. Obstet. Gynecol.*, 1991, 164, 579.
- [2] Reich H., McGlynn F., Wilkie W.: "Laparoscopic management of Stage I ovarian cancer". *J. Reprod. Med.*, 1990, 35, 601.
- [3] Schuessler W.W., Vancaillie T.G., Reich H., Griffith D.P.: "Transperitoneal endosurgical lymphadenectomy in patients with localized prostate cancer". *J. Urol.*, 1991, 145, 988.
- [4] Canis M., Mage G., Wattiez A. et al.: "La Chirurgie endoscopique a-t-elle une place dans la chirurgie radicale du cancer du col uterin?". *J. Gynecol. Obstet. Biol. Reprod.*, 1990, 19, 921.
- [5] Kim D.H., Moon J.S.: "Laparoscopic radical hysterectomy with pelvic lymphadenectomy for early, invasive cervical carcinoma". *J. Am. Assoc. Gynecol. Laparosc.*, 1998, 5 (4), 411.
- [6] Spirtos N.M., Schaerth J.B., Kimball R.E. et al.: "Laparoscopic radical hysterectomy (Type III) with aortic and pelvic lymphadenectomy". *Am. J. Obstet. Gynecol.*, 1996, 174, 1763.
- [7] Mikuta J.J., Giuntoli R.L., Rubin E. et al.: "The 'problem' radical hysterectomy". *Am. J. Obstet. Gynecol.*, 1977, 128, 119.
- [8] Orr J.W., Orr P.J., Holimon J.L.: "Radical hysterectomy: does the type of incision matter?". *Am. J. Obstet. Gynecol.*, 1995, 173, 399.
- [9] Artman L.E., Hoskins W.J., Bibro M.C. et al.: "Radical hysterectomy and pelvic lymphadenectomy for stage Ib carcinoma of the cervix: 21 year experience". *Gynecol. Oncol.*, 1987, 28, 8.
- [10] Massi G., Savino L., Susini T.: "Shauta-Amreich vaginal hysterectomy in the treatment of the cervical cancer: A retrospective analysis". *Am. J. Obstet. Gynecol.*, 1993, 168, 928.
- [11] Barton D.P., Canavagh D., Roberts W.S. et al.: "Radical hysterectomy for treatment of cervical cancer: A prospective study of two methods of closed suction drainage". *Am. J. Obstet. Gynecol.*, 1992, 166, 533.
- [12] Pastner B., Sedlacek T.V., Lovecchio J.L.: "Paraaortic node sampling in small (3 cm or less) Stage Ib invasive cervical cancer". *Gynecol. Oncol.*, 1992, 44, 53.

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