Laparoscopic approach to endometrial cancer

Mario Malzoni M.D.
Technological progress and the ability to operate in the retroperitoneal space have stimulated the use of laparoscopic surgery in Gynecologic Oncology.

In 1989 Querleu described the technique of interiliac pelvic lymphadenectomy by laparoscopy.

In 1991 Querleu published the data concerning the first 39 operations on Am J Obstet Gynacol

In 1992 Childers described the first case of low elective para-aortic lymphadenectomy
In 1992 Nezhat described the first case of laparoscopic radical hysterectomy.

In 1992 Childers described combined laparoscopic and vaginal surgery for the management of two cases of stage I endometrial carcinoma.
In 2003 Malzoni described the first case of Laparoscopic Radical Hysterectomy for stage IIb cervical cancer.
Since the fist experiences, following a "learning curve", currently the laparoscopic procedure is increasingly proposed in treatment of various types of gynaecologic malignancies.
Learning-curve

Laparoscopic surgery is safe, effective and reproducible technique after a period of training, necessary to standardize the procedure.
Learning-curve

Laparoscopic surgery, applied in oncology, must be done only in “third level” center, where usually is performed advanced oncological surgery and advanced laparoscopic surgery.
Gynaecological Oncology & Laparoscopy

Boldness exercise or real advantage for patients?
Why Laparoscopic Approaches?

Laparoscopy allows for identification of cleanage planes better than laparotomy.

Paravesical space
Internal obturator muscle

Superior gluteal vein
Why Laparoscopic Approaches?

Extended abdominal incision are also avoided with a consequent decrease in postoperative pain and hospital stay.
Why Laparoscopic Approaches?

These features turn to be favourable to those patients who must undergo subsequent adjuvant treatment.
When laparoscopy is applied to oncology, the radicalness of surgery must not be compromised by technique.

Choosing a 5 mm incision instead of a 25-30 cm one should not influence the “extent of surgery”

Benedetti Panici PL. Gyn Oncol 1999
Uterine Manipulator for Cervical or Endometrial Cancer

Traumatic effect, during insertion of uterine manipulator, must be minimize.

- No U.M.
- No dilatation of cervical canal
- Smooth cannula
- Preventive coagulation of the tubes
- Clinical experimentation of new U.M.
Endometrial Carcinoma
Epidemiology

The Endometrial cancer represents the 7th neoplasia most common in the world among women, with 1890 new cases every year.

  – (Parkin DM: Lancet Oncol 2001)

Furthermore in the United States during the last 15 years it has been observed that mortality has doubled due to this disease while an incidence of the disease rather steady.

  – (Barakat RP: 1997)
Histotype

- **HOMOLOGUS-TYPE I** (oestrogenic-correlated)
  - Adenocarcinoma (60%) and its variants (20%)
  - Papillary
  - Secretory
  - Ciliated cell
  - With squamous differentiation (adenoacantoma)

- **HETEROLOGOUS-TYPE II** (no-oestrogenic-correlated)
  - Squamus carcinoma
  - Carcinoma undifferentiated

- **ASSOCIATED**

- **MIXED TYPE**
  - Classification OMS 1994
Diffusion

At stage I and II, the main diffusion extrauterine sites are:

- Lymphnodes (11%)
- Adnexes (5%)
- Peritoneum (6%)
- Vagina (7%)

(Creasman WT Cancer 1987)
ESOPHYTIC From the endometrial mucosa towards the uterine cavity

ENDOPHYTIC From the mucosa in the uterine musculature (dominant procedure)
For Contiguity

- In the cervix
  - Parametrial participation
  - (lymphnodes metastasis 16-42%)
- Transtubal
- Lymphatic way

- (Reiffensthul G. JB Lippincott Company 1964)
Despite a variable lymphatic drainage the endometrial cancer mainly difuses through pelvic lymphonodes and only after aortic.

The myometrium infiltration (M) and the grade of tumor differences (G) represents the two most important parameters in determining the risk of pelvic lymphnodes spreading: G1-MO 1-3%, G2-M1 7-9%, G3-M2 20-30%.
The risk of aortic lymphnodal metastasis is mainly linked to the presence of adnexed metastasis and/or to pelvic lymphnodes metastasis.

The aortic lymphnodes are positive:
- 2% with negative pelvic lymphnodes
- 20-57% with adnexal metastasis
- 38-52% with positive pelvic lymphnodes

- (Benedetti Panici PL. Int J. Gynaecol Cancer 1998)
Endometrial Carcinoma

Laparoscopic Surgery

- Lymphadenectomy
  - Para-aortic
  - Pelvic

- Hysterectomy (extrafascial)
  - LAVH
  - TLH

- Radical Hysterectomy (Piver II)
  - LAVRH
  - TLRH
Pre-operating Diagnostics

- Anamnesis
- Clinic survey of pelvis
- Transvaginal US (miometrium infiltration)
- Diagnostic Hysteroscopy (intracavity extension and involvement of mucosa in cervical canal).
- Exeresis biopsy for hystologic test (grading, histotype)
- MR
In 1996 we began to perform LAVH extrafascial with or without Lymphadenectomy.

It was the first step of a laparoscopic learning curve.

From 1997 we performe only TLH with or without lymphadenectomy.
In according with the "Querleu classification" of the level of lymphadenectomy.
(level 1 - 2 - 3 or 4)
Stage I
Low Risk Tumor
- cavity extension <50%
- No cervical involvement
- G1
- M0 at US
- Normal ovary at US

TLH extrafascial

Frozen section

M1 G2 - M2 - G3

Pelvic Lymphadenectomy

Low risk

No Lymphadenectomy

Aortic Lymphadenectomy

Frozen section

Pelvic Lymphadenectomy

Frozen section

+ STOP

-
Endometrial Carcinoma
our clinical experience

Stage I
High Risk Tumor
Cavity extension >50%
NO cervical involvement
G2-G3
M1-M2 at US
Normal ovary at US

Pelvic Lymphadenectomy

Frozen section

+ ➔ TLH extrafascial

Aortic Lymphadenectomy
Endometrial Carcinoma
our clinical experience

Stage II → Pelvic Lymphadenectomy
        ↓ Frozen section

Aortic Lymphadenectomy

+ * -

TLRH (tipe II)
Radical hysterectomy

- The uterine vessels are identified, allowing an excellent skeletonization of the obliterated hypogastric artery, by preparing the pararectal space.
- The uterine artery and vein are coagulated and transected at their origin.
Radical hysterectomy

- The roof of the ureteral tunnel is transected.
- At this point the lateral parametrium is coagulated and transected.
the dissection of the ureter from the tunnel
To free the external part of vescicouterine ligament (anterior parametrium) from ureter, this lateral ligament is coagulated and transected near the bladder (PIVER type III Radical Hysterectomy).
Then the posterior parametrium is dissected.

To dissect the rectovaginal space, the uterus is anteverted and anteflexed.

The rectum is dissected off posterior vaginal wall.
Radical hysterectomy

- The upper third of the vagina is visualized and transected 3-5 cm under the cervix incising the vagina circumferentially using the porcelain-valve of the uterine manipulator as a guide.

- The uterus, the ovaries, the parametria and the upper third of the vagina is removed vaginally.

- The vaginal vault is closed by Laparoscopy.
Endometrial Carcinoma exclusion criteria

Aggressive histotype or “High risk” for adnexal metastases.
Endometrial Carcinoma exclusion criteria

Gross obesity with BMI > 35

Sometimes this patients could benefit of minimally invasive surgery

Scribner DR. Gynecol Oncol 2001
Endometrial Carcinoma exclusion criteria

- Big uterus. > 12 weeks of gestation.
- Poor vaginal access

The “morcellement” of uterus is needed to remove the specimen through the vagina
Our Experience
january 1997 - september 2003

154 cases

46 pt
Total extrafascial hysterectomy

98 pt
Total extrafascial hysterectomy + pelvic lymphadenectomy

5 pt
Total extrafascial hysterectomy + pelvic and para-aortic lymphadenectomy.

4 pt
Radical hysterectomy Piver II + pelvic lymphadenectomy.

1 pt
Radical hysterectomy Piver II + pelvic and para-aortic lymphadenectomy.
## Endometrial Carcinoma

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<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>61.8 ±6.7 (32-76)</td>
</tr>
<tr>
<td><strong>parity</strong></td>
<td>2.2 ±1.3 (0-5)</td>
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<tr>
<td><strong>BMI (Kg/m^2)</strong></td>
<td>28.2±4.8 (17.8-56.1)</td>
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<tr>
<td><strong>Uterine weight (gram)</strong></td>
<td>208 ±98 (60-390)</td>
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<tr>
<td><strong>Grading:</strong></td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>34 [36.2]</td>
</tr>
<tr>
<td>G2</td>
<td>40 [42.5]</td>
</tr>
<tr>
<td>G3</td>
<td>20 [21.3]</td>
</tr>
<tr>
<td><strong>Miometrum involvement:</strong></td>
<td></td>
</tr>
<tr>
<td>M0</td>
<td>19 [20.2]</td>
</tr>
<tr>
<td>M1</td>
<td>45 [47.9]</td>
</tr>
<tr>
<td>M2</td>
<td>30 [31.9]</td>
</tr>
<tr>
<td><strong>Histotype:</strong></td>
<td></td>
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<tr>
<td>Solid type</td>
<td>80 [85.1]</td>
</tr>
<tr>
<td>Secretive differentiation</td>
<td>5 [5.3]</td>
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<tr>
<td>Squamous differentiation</td>
<td>5 [5.3]</td>
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## RESULTS OF CLINICAL OUTCOME

- **Total operating time (minutes):** 95 ± 21
- **Postoperative day haemoglobin drop (g/dl):** 1.6 ± 0.4
- **Hospital stay excluding the surgery (days):** 2.3 ± 1
- **Mean pelvic lymph nodes:** 21.4 ± 3
## Parametri

### COMPLICATIONS
- Bowel injury
- Bladder rupture
- Ureteral injury
- Fever (>38°C)
- Vaginal cuff abscess
- Abdominal wall hematoma

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<tr>
<td></td>
<td>1</td>
<td>(1.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(4.2)</td>
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Results (92 pt.)

Parameters

RATE

✓ Blood transfusions
✓ Reoperation by laparotomy
Overall 3-year survival: preliminary results

FOLLOW-UP
41 months (36-60)

| Stages | pt |%
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<tr>
<td>Ia</td>
<td>17/18</td>
<td>(94.4%)</td>
</tr>
<tr>
<td>Ib</td>
<td>35/39</td>
<td>(89.7%)</td>
</tr>
<tr>
<td>Ic</td>
<td>19/23</td>
<td>(82.6%)</td>
</tr>
<tr>
<td>II</td>
<td>3/4</td>
<td>(75.0%)</td>
</tr>
<tr>
<td>IIIa</td>
<td>2/4</td>
<td>(50%)</td>
</tr>
<tr>
<td>IIIc</td>
<td>3/4</td>
<td>(75%)</td>
</tr>
</tbody>
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Carcinoma of the corpus uteri
1993–95 ... (5694 pt)
A standard bowel preparation was used one day before surgery.

Antibiotic prophylaxis with cefoxitin 2 gr/day intravenously one hour preoperatively was used.

The procedure was performed under bleended anesthesia (epidural and general).

The patients were placed in dorsolithotomy position with arms tucked at her side.

The vaginal cavity was cleansed with povidone-iodine solution and a Foley catheter was placed in the bladder.

After dilation with Hegar dilators (n°7 1/2), a uterine manipulator (Clermont Ferrand) was inserted.
A Veress needle was inserted through the umbilical and CO₂ pneumoperitoneum was established.

A 10-mm laparoscope was inserted through a vertical supraventricular incision and connected to video monitors.

Before the operative procedure, all pelvic structures were inspected carefully and the abdomen was explored through the laparoscope in a clockwise fashion.

Three ancillary trocars are placed 2-3 cm under the umbilicus:

- one 5 mm in the mid-line (surgeon)
- one 5 mm in the left side (surgeon)
- one 10 mm in the right side (first assistant)
Pelvic Lymphadenectomy

- Inspection of abdominal cavity and coagulation of tubes before introduction of uterine manipulator
The round ligament is coagulated next to the pelvic wall with the bipolar forceps (40W) and transected with endoscopic shears.

The anterior and posterior peritoneal layers of the broad ligament is opened and the ureter is identified.
Obliterated hypogastric artery

Paravesical space

Ureter

Infundibulo-pelvic ligament
Pelvic Lymphadenectomy

Medial limit of pelvic lymphadenectomy

- Dissection of the paravesical space is aided by introducing endoshears and the bipolar forceps initially in the areolar tissue laterally to the obliterated umbilical artery. Obturatory nerve is identified.
Pelvic Lymphadenectomy

Caudal limit of pelvic lymphadenectomy (on the bone)
Arteria epigastrica inferiore

Arteria e vena circonflessa

Arteria e vena otturatoria

Arteria e vena iliaca esterna
Pelvic Lymphadenectomy

Lateral limit of pelvic lymphadenectomy

External iliac vessels are separated from the psoas muscle, while preserving the genitofemoral nerve. The external iliac lymphnodes are dissected from lateral surfaces of these vessels.
Pelvic Lymphadenectomy

Identification of external iliac artery and vein and opening of lateral obturator fossa
Canale otturatorio
Fascia sul muscolo otturatore interno
Parti pubo-coccigea e pubo-rettale del muscolo elevatore dell’ano
Arco tendineo del muscolo elevatore dell’ano
Parte ileo-coccigea del muscolo elevatore dell’ano
Spina ischiatica
Muscolo piriforme
Tendinous arch of elevator ani muscles

Left obturator muscle

Iliococcygeal muscle
Pelvic Lymphadenectomy

Systematic pelvic lymphadenectomy with integral dissection of the entire lymphatic and connective tissue up to the tunica adventitia, seem to permit removal of a great number of lymph nodes and interruption of most of the collectors between the neoplastic focus and the Pequet’s Cysterna, drainage station of most of lymph originating the pelvic organs.
Pelvic Lymphadenectomy

Obturator nerve and vessels are skeletonized, before removing superficial and deep obturator lymph nodes.
Pelvic Lymphadenectomy

Cranial part of pelvic lymphadenectomy

Lymphadenectomy on the deep part of vein an ileo - lumbar fossa
Nervo genito-femorale (sezionato)

Nervo otturatorre

Tronchi lombo-sacrali
Pelvic Lymphadenectomy

En-block lymphadenectomy

Interiliac or “Leveuf et Godard area” lymph nodes, medial and caudal to the external iliac vessels, are dissected. Medial external iliac lymphonodes and laterals / superficial obturatory lymphonodes are removed.
Pelvic Lymphadenectomy

The retroperitoneum is opened and nodal tissue is removed from around common iliac vessels. Preserving superior hypogastric plexus, lymph nodes of the presacral area are removed.
Conclusions

Laparoscopic approach to gynaecological cancer in expert hands and after an adequate "learning curve" in an oncological laparoscopic centre could be safe.
Conclusions

- Our experience with the laparoscopic approach in gynaecological oncology seems promising.
  - The operating time has become acceptable.
- The magnification provided by laparoscope is an advantage as it minimizes trauma to the ureters and to the bladder.
Conclusions

“Any surgical procedure can be achieved endoscopically by experienced surgeons; therefore the main question is not to know whether or not the procedure is possible but if it’s valuable and safe”.
Conclusions

These questions are to be answered using large prospective clinical trials, not wonderful pictures or beautiful videotapes.
Thank you