Complications and Management in gynecological endoscopic Surgery

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Laparoscopy Training Course
Harare Zimbabwe  14\textsuperscript{th} - 18\textsuperscript{th} March 201
Complications:

- How to avoid them …
- How to recognize them as early as possible …
- How to treat them adequately …
### Complications: statistics 2000 to 2011

#### Cases of endoscopic surgery overall

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hysteroscopy</td>
<td>9000</td>
</tr>
<tr>
<td>Myomectomy</td>
<td>1200</td>
</tr>
<tr>
<td>Endometrial Ablation</td>
<td>900</td>
</tr>
<tr>
<td>Uterine septum</td>
<td>200</td>
</tr>
<tr>
<td>other</td>
<td>800</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11000</strong></td>
</tr>
</tbody>
</table>

**Laparoscopy**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Total laparoscopic hysterectomy</td>
<td>2200</td>
</tr>
<tr>
<td>Subtotal laparoscopic hysterectomy</td>
<td>800</td>
</tr>
<tr>
<td>Myomectomy</td>
<td>2500</td>
</tr>
<tr>
<td>Adnexas</td>
<td>3000</td>
</tr>
<tr>
<td>Lymphonodectomy</td>
<td>250</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22000</strong></td>
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</tbody>
</table>
Complications:

- Hernia +/- incarceration of the small intestine in the incision
- Injury of the bladder with the medial trocar
- Injury of the aorta with the Veress-needle
- Injury of the vena cava with the Veress-needle
- Injury of the iliac artery with the lateral trocar
- Injury of the iliac vein with the lateral trocar
- Injury of the stomach with the Veress-needle
- Injury of the large intestine with the Veress-needle
- Injury of the small intestine with the Veress-needle
- Injury of the aorta with the Veress-needle
- Injury of the vena cava with the Veress-needle
- Lesion due to the position: shoulder or cervical, thoracic, lumbar spine
- Lesion due to the position: ischiadic or femoral nerve
- Lesion due to the position: peroneus nerve
- Lesion due to the position: gluteal muscles
- CO₂-emphysema
- Infection of the incisions
- Hernia +/- incarceration of the small intestine in incision
- Infection of the incisions
- Injury of the epigastric blood vessels with the lateral trocar
- Injury of the bladder with the medial trocar
- Injury of the iliac artery with the lateral trocar
- Injury of the iliac vein with the lateral trocar

... due to (minimal) access
Complications: due to the (laparoscopic) method

Thermic lesion of the small intestine (unipolar cauterisation)

Thermic lesion of the large intestine (unipolar cauterisation)

Thermic lesion of the bladder wall (unipolar cauterisation)

Injury of the bladder wall with instruments or manipulation

Injury of the iliac artery with instruments or manipulation

Injury of the iliac vein with instruments or manipulation

Thermic lesion of the rectum (unipolar cauterisation)

Injury of the iliac artery with instruments or manipulation

Injury of the iliac vein with instruments or manipulation

CO$_2$-embolism

Pulmonary embolism

Hypoxic damage (Trendelenburg position)

Hypothermia

Injury of the small or large intestine with the morcellator

Injury of the uterus With the manipulator
Complications:

Due to hysterectomy itself:

- Empyema of the vaginal vault parametritis
- Dehiscence of the vaginal vault
- Ureterovaginal fistula
- Rectovaginal fistula
- Thermic lesion of the large intestine (unipolar cauterisation)
- Retroperitoneal haematoma
- Secondary hemorrhage adnexal vessels
- Secondary hemorrhage uterine vessels
- Injury of iliac vessels with the instruments

Thermic or traumatic lesion of the ureter (cauterisation or sutures):
- Thermic lesion of the ureter (unipolar/bipolar cauterisation, ultrasound) in the fossa ovarica
- Thermic lesion of the ureter (cauterisation, ultrasound) over iliacal vessels
- Thermic lesion of the bladder bottom (unipolar cauterisation)
- Prevesical thermic lesion of the ureter (unipolar/bipolar cauterisation, ultrasound)
- Secondary hemorrhage uterine vessels
- Secondary hemorrhage adnexal vessels
- Vesicovaginal fistula
- Rectovaginal fistula
- Ureterovaginal fistula
- Retroperitoneal haematoma
- Secondary hemorrhage adnexal vessels
- Secondary hemorrhage uterine vessels
- Injury of iliac vessels with the instruments
- Thermic lesion of the large intestine (unipolar cauterisation)
Complications:

How to avoid them ...

How to recognize them as early as possible ...

How to treat them adequately ...
The greatest complication is the missing or wrong indication for a surgical procedure
Main reasons:

Boldness or audaciousness

Overestimation of one’s own capabilities

False estimation of the situation

Lack of knowledge, skill and experience

Untrained team or unity

Insufficient or inadequate instruments
Complications: **avoid complications (3)**

**Boldness or audaciousness**
Complications:

- avoid complications (4)

Overestimation of one’s own capabilities
Complications: avoid complications (5)

False estimation of the situation (especially for our Indian friends)
Complications:

Lack of knowledge, skill and experience

avoid complications (6)
Complications:

avoid complications (7)

Untrained team oder unity
Complications:

- insufficient or inadequate equipment

avoid complications (8)
Main reasons:

- Boldness or audaciousness
- Overestimation of one’s own capabilities
- False estimation of the situation
- Lack of knowledge, skill and experience
- Untrained team or unity
- Insufficient or inadequate instruments
Injuries of the ureter: hazard zones

1. Crossing of the ureter with the ovarian vessels

2. Fossa ovarica

3. Crossing of the ureter with the uterine vessels

4. Prevesical part of the ureter

1. + 2. Surgery on the adnexa (post hysterectomy), endometriosis, adnexal mass

3. + 4. Hysterectomy
Injuries of the ureter: effect of traction on the uterus

- Traction on the uterus
- Abdominal or laparoscopic hysterectomy

Diagram showing:
- Branch to round ligament
- Anastomotic branch
- Mesosalpinx
- Hilum of ovary
- Tubal ramus
- Ovarian artery
- Infundibulopelvic ligament
- Bladder
- Branch to ureter
- Uterine artery
- Vaginal artery
- Azygos arteries
- Vagina
- Rectum
- Broad ligament
- Peritoneal edge
- Cervix
- Cul-de-sac

Vaginal hysterectomy
Injuries of the ureter: effect of the upwards uterus traction

abdominal or laparoscopic hysterectomy
Injuries of the ureter: effect of the downwards uterus traction

vaginal hysterectomy
Injuries of the ureter:

effect of the failing uterus traction

Hazards of a (blind) bipolar coagulation
Complications:

Video 2

The distance between ureter and cervix
Learning curve total laparoscopic hysterectomy (TLH)

Uterine weight (gramm)  
\( n = 500 \)  

- Major complications
- Minor complications
Learning curve total laparoscopic hysterectomy (TLH)

Duration of surgery (min)  
$n = 500$  

- **major complications**
- **Minor complications**
<table>
<thead>
<tr>
<th>Complication</th>
<th>Cases</th>
<th>Rate</th>
<th>Reference Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genitourinary tract</td>
<td>4/500</td>
<td>0.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Secondary hemorrhage</td>
<td>4/500</td>
<td>0.8%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Infection</td>
<td>4/500</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Bowel lesion</td>
<td>0/500</td>
<td>0.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Other</td>
<td>3/500</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15/500</td>
<td>3.0%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

*) Quality management gynecological surgery region of Hessen 2008

Postoperative complications requiring re-operation
"Minor complications" of total laparoscopic hysterectomy

<table>
<thead>
<tr>
<th>Complication</th>
<th>Incidence</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genitourinary tract</td>
<td>1/500</td>
<td>0,2 %</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>2/500</td>
<td>0,4 %</td>
</tr>
<tr>
<td>Infection</td>
<td>3/500</td>
<td>0,6 %</td>
</tr>
<tr>
<td>Lesion (bladder)</td>
<td>2/500</td>
<td>0,4 %</td>
</tr>
<tr>
<td>Summe</td>
<td>8/500</td>
<td>1,6 %</td>
</tr>
</tbody>
</table>

Intraoperative lesions and postoperative complications not requiring re-operation
- **Bladder lesion**: Re-operation 2 days later (LSK), bladder catheter 7 days
- **Vesicovaginal fistula**: Re-operation 9 days later (LSK), bladder catheter 10 days
- **Ureterovaginal fistula**: Conservative treatment 17 days later (pigtail)
- **Stricture of ureter (vaginal vault)**: Re-operation 4 days later (LSK) decompression
- **Prevesical hematoma**: Re-operation 2 days later (LSK)
- **Prevesical hematoma**: Re-operation 2 days later (LSK) + 2x blood transfusion
- **Abdominal wall hematoma (trocar)**: Re-operation 3 days later
- **Hemorrhage**: Re-operation 1 day later (LSK)
- **Tubo ovarian abscess**: Re-operation 17 days later (LSK)
- **Adhesions with pain**: Re-operation 7 weeks later (LSK – adhesiolyse)
- **Abscess vaginal vault**: Re-operation 7 days later (LSK – appendectomy)
- **Purulent peritonitis (Salmonella)**: Re-operation 2 days later (Laparotomy) no bowel lesion
- **Dehiscence vaginal vault**: Re-operation 3 Weeks later
- **Vaginal tear**: Re-operation 2 hours later
- **Vaginal tear**: Re-operation 1 day later + 3x blood transfusion
Complications:

Complications

How to avoid them …

How to recognize them as early as possible …

How to treat them adequately …
Complications:

Drainage

... as many and
... as big
as necessary
Complications:

- Drainage
- Urine
  - Secretion (small intestine)
- Blood
  - Faeces (large intestine)
Complications:

Complications

How to avoid them …
How to recognize them as early as possible …
How to treat them adequately …
Video 3

Laparoscopic management of complications
How Cars are Recovered in Ireland

The Murphy's Law Story

Or

How to Compound a Catastrophe
“Hey Paddy, we've got dis here car ta pull out.”
“Shamus, we’re pullin’ it up now.”
“Here Paddy, what happens if da crane can’t hold it?”
“Shamus me lad, don’t you even tink about dat happening.”
“Hoy Paddy, oi didn’t even tink it, oh shoit!”
"Shamus, moi boy, go get a bigga crane."
"Alroight, Paddy."
“Ah Shamus, dis bigga crane is doin’ da job well.”
“Dat it is Paddy, dat it is.”
“Now for da first crane Shamus, up it cooms.”
“What's happening Paddy, what's happening.”
“Oh f*#k Shamus, we’ve got to get an even bigger crane!”
Thank you for your attention!
Thank you for your attention!
Complications:

Thank you for your attention!
## Complications - acute symptoms

< 24 h

<table>
<thead>
<tr>
<th>Complication</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laparoscopy training course</td>
<td>14th to 18th March Harare Zimbabwe</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp lesion, open cavity or great vessel (knife, scissors)</td>
<td>Complete ligation or occlusion (hernia) retrperitoneal vessel injury</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bladder</strong></td>
<td>Abdominal fluid &gt; 1-2 l (palpation, ultrasound)</td>
</tr>
<tr>
<td></td>
<td>No pain, urinary dysfunction, hematuria</td>
</tr>
<tr>
<td></td>
<td>Urine loss via drainage or incisions (creatinine)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ureter</strong></td>
<td>Abdominal fluid &gt; 1-2 l (palp, ultrasound)</td>
</tr>
<tr>
<td></td>
<td>No urinary dysfunction (unilateral)</td>
</tr>
<tr>
<td></td>
<td>Urine loss via drainage or incisions (creatinine)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Small Intestine</strong></td>
<td>Abdominal pain, subileus, distended abdomen</td>
</tr>
<tr>
<td></td>
<td>Greenish yellow loss via drainage (bilirubin)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Large Intestine</strong></td>
<td>Abdominal pain, subileus, distended abodomen</td>
</tr>
<tr>
<td></td>
<td>Greenish yellow loss via drainage (bilirubin)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bleeding</strong></td>
<td>Abdominal fluid &gt; 1-2 l (palp, ultrasound)</td>
</tr>
<tr>
<td></td>
<td>Anämie, hemorrhagic shock</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- < 24 h
- Retroperitoneal injury major vessels (mortality)
### Complications - subacute symptoms

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Symptoms and Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bladder</strong></td>
<td><em>Urinary phlegmon, (abdominal wall and genital region)</em> &lt;br&gt; <em>Abdominal tension or rigidity, fever</em> &lt;br&gt; <em>Secondary peritonitis, urosepsis</em></td>
</tr>
<tr>
<td><strong>Ureter</strong></td>
<td><em>Periurethral edema, consecutive hydrenephrosis, fever, subileus</em></td>
</tr>
<tr>
<td><strong>Small Intestine</strong></td>
<td><em>Abdominal pain, ileus, distended abdomen</em> &lt;br&gt; <em>Severe (chemical) peritonitis</em></td>
</tr>
<tr>
<td><strong>Large Intestine</strong></td>
<td><em>Abdominal pain, ileus, distended abdomen</em> &lt;br&gt; <em>Severe septical peritonitis,</em> &lt;br&gt; <em>Sepsis (mortality)</em></td>
</tr>
<tr>
<td><strong>Bleeding</strong></td>
<td><em>Retroperitoneal injury major vessels</em></td>
</tr>
</tbody>
</table>

**24 – 48 hours**

- Partially open cavity *(mechanical trauma)*
- Partial ligation or occlusion *(hernia)*
- Lesion small vessel

- Urinary phlegmon, *(abdominal wall and genital region)*
- Perivesical hematoma
- Pain, dysuria, microhematuria

- Periurethral edema, consecutive hydrenephrosis, fever, subileus
- Unilateral back pain *(renal bed)*
- Hydrenephrosis *(ultrasound)*
- Fever, preileus

- Abdominal pain, ileus, distended abdomen
- Abdominal cramps, nausea, vomiting
- Partial ileus *(x-ray!)*

- Abdominal cramps, nausea, vomiting
- Complete ileus *(x-ray!)*, local sepsis *(mortality)*

- Retroperitoneal injury major vessels
- Hematoma Douglas cavity
<table>
<thead>
<tr>
<th>Complications - delayed symptoms</th>
<th>3 - 6 days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>thermic lesion</strong> (monopolar, bipolar, ultrasound)</td>
<td>incarcerated hernia, adhesions, infection</td>
</tr>
<tr>
<td><strong>Bladder</strong></td>
<td></td>
</tr>
<tr>
<td>urinary phlegmon, (abdominal wall and genital region) secondary peritonitis, urosepsis</td>
<td>dysurie, cramps (trocar associated)</td>
</tr>
<tr>
<td><strong>Ureter</strong></td>
<td></td>
</tr>
<tr>
<td>unilateral back pain (renal bed) periurethral edema, consecutive hydro-nephrosis, fever, subileus</td>
<td>pyelonephritis</td>
</tr>
<tr>
<td><strong>Small Intestine</strong></td>
<td></td>
</tr>
<tr>
<td>abdominal pain, ileus, distended abdomen severe (chemical) peritonitis</td>
<td>abdominal cramps, nausea, vomiting partial ileus (x-ray!)</td>
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<td><strong>Large Intestine</strong></td>
<td></td>
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<tr>
<td>abdominal pain, ileus, distended abdomen severe septical peritonitis, sepsis (mortality)</td>
<td>abdominal cramps, nausea, vomiting complete ileus (x-ray!), local</td>
</tr>
<tr>
<td><strong>Post-op Infection</strong></td>
<td></td>
</tr>
<tr>
<td>Douglas pouch abscess urinary infection pyelonephritis septical peritonitis (vagina?)</td>
<td></td>
</tr>
</tbody>
</table>
## Complications - delayed symptoms

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<th>Symptoms</th>
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<tr>
<td><strong>Infection</strong></td>
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</tbody>
</table>

**2 - 6 weeks**