Complications & follow-up

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Complications: background
Preventable increase in morbidity

• Complications of the disease
• Complications during surgery
  • Lesions: Ureter – bowel – nerves - vascular
    Unclear which are necessary - accidents
  • Ovarian reserve
• After surgery
  • Bleeding, infection, pain
  • Late bowel perforations, Small bowel perforations
  • Fistula’s: ureter, bladder, rectum -> vagina
  • Compartment syndrome, plexus brachialis, eye
  • Adhesions

Endometriosis causes several types of complications
This presentation only discusses prevention of complications after surgery
Complications: no RCT’s

• Medicine = experience and knowledge based progression in diagnosis and treatment.

1% incidence = RCT of 6000
In order to have 30 ‘cases’ in each group
many surgical ‘rules’ were introduced after 1 accident

Complications are rare events: therefore only authority based medicine by experts is useful eg our article
RCT are not suited for complications
Decisions at the end of surgery

• Did I miss something ?
  • Bowel – bladder – ureter – vascular ?

• Specific risks ?
  • Bladder surgery
  • Ureter surgery
  • Bowel surgery
  • Infection
  • Long duration of surgery

• Check bowel
• Stent - cystoscopy
• Prophylactic suture
• Lavage : how extensive
• Drain
• Antibiotics – when- how long
• Bladder Catheter
• Nil by mouth
• Blood exams
• In hospital

Decisions to be taken at the end of surgery
  - before closing
  - postoperative follow-up
After full thickness bladder Surgery

- Check for leakage with blue dye
- Cystoscopy
- A large urinary catheter to prevent obstruction by blood clots
- Inform the patient and the nurses to check regularly bladder
- When urine is clear patient can go home day 2-3

- Cystofix ??
- Antibiotics for 7 days
- Remove catheter after 10 to 20 days
- Check bladder with X ray: unclear

- Specific complications: none
After Ureter Surgery

not dissection

- Stent
- A laceration has to be sutured
- Urinary catheter for 7 days (pression)
- Omentum interposition (macrophage source)
  - No unless infection

- In doubt
  - ? Prophylactic suturing
  - Cytoscopy

Always a stent ?
damage to the ureter which becomes a fibrotic tube
After bowel Surgery
Muscularis – full thickness - resection anastomosis

• Prophylactic suturing
• Check for leakage
  with blue dye – air – or both
  150 ml for rectum – 300 ml for sigmoid
  Well closed insufflation system

• Lavage +++
• Drain
  If risk of infection: (macrophages cannot swim)
  Can be the first sign of bowel perforation
Lavage

- Do not use saline
- More is better
  Upper abdomen
  Until clear
  Removal of macrophages ??
  With heparin ??

- Debris – clots - infection
- Prevents peritoneal cavity inflammation / oxidative stress
  Part of peritoneal conditioning: 10% N2O and cooling
  If used together with barrier: no adhesion formation
  Prevention of postoperative fatigue.

  - Faster recovery
    - Shoulder pain 0/16 <> 7/11
    - Day 1 independent 9/16<>0/11
    - Day 2 independent 16/16<>4/11
    - First flatus 19 <> 36 hours

Postoperative Care

- Clinically: 2*/day
- Daily CRP
- Temp, leucocytosis...

- Some decisions were taken at the end of surgery
- Postop care = clinic + CRP + principles

- The patient should always improve
- CRP: Day 3 should go down
- In doubt: repeat laparoscopy
  - Late bowel perforation
  - Small bowel
  - Bleeding, ureter leak, infection

Have been decided
- Antibiotics
- Catheter
- Videoregistration
- Urinary retention
In the early nineties

• Type I - II - III lesions
  • -> adenomyosis externa
• Becoming bigger each year
• With conservative CO2 laser excisional surgery
• ..... we had
  • a late bowel perforation
  •  And a colostomy
  •  And a law suit

After 3 days – little symptoms – all specialists of the hospital involved – peritonitis 4 days later - colostomy – high care

History of late bowel perforation : Leuven 1996
  - we did not know and therefore we missed
  - and therefore we published
Complications of CO$_2$-laser endoscopic excision of deep endometriosis

Philippe R. Koninckx$^{1,3}$, Brigitte Timmermans$^1$, Christel Meuleman$^1$ and Freddy Penninckx$^2$

- N=225 deep endometriosis excisions
- Type II & III: adenomyosis nodules larger
- Duration decreased with expertise increased with size
- 6.3% full thickness resection
- 7 late bowel perforations = 2-3%
  - 3 after 1 week

<table>
<thead>
<tr>
<th>Table I. Deep endometriosis age of the women, indications for surgery and depth, volume and revised AFS score</th>
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<tbody>
<tr>
<td>Deeply infiltrating endometriosis</td>
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<tr>
<td>Type I ($n = 99$)            Type II ($n = 55$)            Type III ($n = 71$)            Total ($n = 225$)</td>
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<tr>
<td>Age (years)*</td>
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<td>Depth (mm)*</td>
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<td>Volume (ml)*</td>
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<td>% in revised AFS class I</td>
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<td>class II</td>
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<td>class III</td>
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<td>class IV</td>
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Surgery of the 90ies: very complete with removal of muscularis
Today a rim of fibrosis is left – with no increase in recurrence rates
It should be clear that knowledge changes over time
Late bowel perforation: in 2016 still absent from PubMed. !!

Surgeons do not publish their complications.

A known problem after resection anastomosis.
Resection anastomosis.

Complications

- 1% leak
- 5-15% leak
- ++ bladder and bowel problems

L Ret Davalos, de Cicco, D’Hoore, P Koninckx J Min Invas Surg 2011
a review of all cases since 1990 = > 10,000

Incidence of leaks is high after low rectum resections which therefore should be avoided
Late bowel Perforation: symptoms

- Acute pain disappearing spontaneously
- No other clinical symptoms for 24 hours
- CRP: increases after 6-12 hours

Every deep endometriosis surgeon should know the symptoms
Late bowel Perforation: less than 24h

- Surgery 3 pm
- 6 am acute pain
- ……..
- 10 am: info

Immediate lap

Key is early diagnosis and suturing and extensive lavage.
Late bowel Perforation < 24 h

- If diagnosed within 24 hours
  - Suture in 2 layers
  - Extensive rinsing with 8 liters also above the liver
  - Antibiotics
  - 1 drain in the douglas, 1 drain in right colic gutter
- All of them were further uneventfull and were discharged 5-7 days later (some 50 in 1500 deep endometriosis patients)
  - Except 1

Key is early diagnosis and suturing and extensive lavage. If surgery is delayed more than 24 hours a colostomy is difficult to avoid. although feasible – but this should be considered ‘experimental’
Late bowel Perforation: more than 48h

**Lavage**
- Second lavage 2 days after suturing
- Careful over and under liver
- Between all bowel loops to prevent abcedation
- Takes 1 hour

See extensive fibrin = difficult surgery + repeated lavages
Clinical picture and Diagnosis of late Small bowel perforation

• Consider that something is wrong when
  • Patient is clinically worse than 6 hours before
  • CRP starts going up day 3
  • Leucocytosis is of no use
  • Clinical exam is close to useless

• If something is suspected, Consider a repeat laparoscopy
  • In contrast with ureter, bladder or rectum lesions additional exams are not useful, except maybe a CAT scan which may detect a collection
Case report : IV  2006

Diagnosis
Small bowel perforation
In the upper abdomen

Repeat laparoscopy based upon CRP and a trailing recovery
Discussion

• Etiology?
  • Manipulation: We do not see what happens outside the field of the laparoscope

• Symptomatology: very insidious with minimal of no clinical signs except trailing CRP’s, or slight fever

• Only aggressive repeat laparoscopy will make the diagnosis and prevent a long story of pain, fistulisation and medico-legal action.
Late ureteral leak

• Diagnosis
  • Increase in drain volume
  • Increase in CRP
  • Generally little pain or asymptomatic

• Treatment: stich and stent

• Urinoma
  • peritoneal irritation, pain, diarrhea

• Fistula ureter-vaginal fistula
  • after 1 week to 3 weeks,
  • Intermittent leak
  • diagnosis: IVP uro CAT
  • Also laparoscopic treatment

Early repeat laparoscopy!!
Vesico-vaginal fistula

Incidence: after endo/surgery is extremely rare, mainly after hysterectomy <1%

• Mechanism?
  • Suture when suturing vagina
  • Lesion during dissection, coagulation
  • Infection

• Symptoms: obvious continuous leak from vagina

• Diagnosis: cystography, methylene blue

• Laparoscopic treatment
  • Immediately
  • Not between 15 and 50 days after surgery

Early diagnosis and treatment
Recto Vaginal Fistula’s

• Incidence
  • Our series 1% - impression to have decreased since 2000 and disappeared since the introduction of lavage
  • Variable in the literature up to 10%
  • Also after bowel resection

• Prevention ?
  • Less coagulation: similar for CO2 laser
  • Aggressive treatment of Hematoma after surgery

• Treatment

Early diagnosis and treatment ??
Not yet clear
Conclusions

• Deep endometriosis surgery needs a team
  • During surgery
  • Watch out for fatigue

• Needs an Experienced team
  • For follow up
  • Early repeat laparoscopy in doubt
  • daily CRP

• the absence of adhesions will be the future

Role of the peritoneal cavity in the prevention of postoperative adhesions, pain, and fatigue

[References]
Introduction: Quality of pelvic surgery and postoperative adhesions

Microsurgical principles and postoperative adhesions: lessons from the past

Role of the peritoneal cavity in the prevention of postoperative adhesions, pain, and fatigue
1. Prevent acute inflammation of the peritoneal cavity

- gentle tissue handling
- gaz with 10% N2O and <5% O2
- cooling to 30 °C
- no desiccation
- Ringers lactate for irrigation

2. Prevent inflammation at trauma site & peritoneal cavity

- no blood
- no debris
- avoid resorbable sutures = extensive lavage
- dexamethasone

3. Keep denudated surfaces separated

- barrier

Prevention of adhesion formation based on pathophysiology. Steps 1 and 2 result in 85% adhesion prevention. Together with step 3, adhesion prevention becomes close to 100%.