Innovation in

4th edition

ENDO DUBAI 2019

21st - 23rd February 2019

Hotel Intercontinental Festival City, Dubai

# Complications and follow-up

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Disclosures: Shareholder Endosat NV

# Complications : background

Preventable increase in morbidity

- Complications of the disease
- Complications during surgery
  - Lesions  Ureter – bowel – nerves - vascular
    Unclear which are nececessary - 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 authority based

- 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

Fertility and Sterility® Vol. 98, No. 3, September 2012

**Deep endometriosis: definition, diagnosis, and treatment**

Philippe R. Koninckx, Ph.D.,[a,b,c,d] Anastasia Ussia, M.D.,[d] Leila Adamyan, Ph.D.,[e] Arnaud Wattiez, Ph.D.,[f] and Jacques Donnez, Ph.D.[g]

*Complications are rare events : therefore only authority based medicine by experts is useful*
*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
- Colostomy- ileostomy
- Prophylactic suture
- Omentum interposition
- 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 the 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

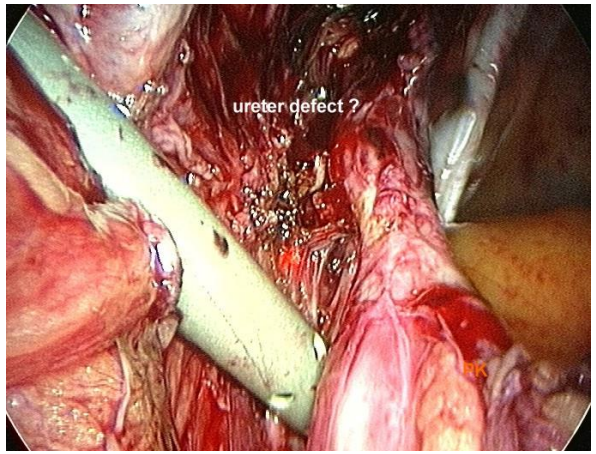
- Double J Stent
- A laceraton has to be sutured
- Urinary catheter for 7 days  (pression)
- Omentum interposition (macrophage source)

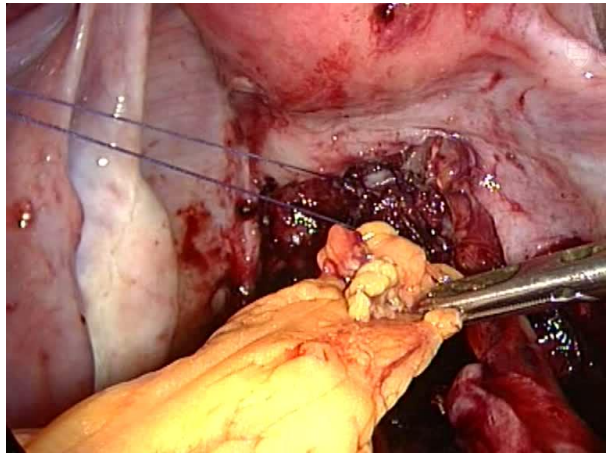
  No unless infection

- In doubt

  ? Prophylactic suturing

  Cystoscopy



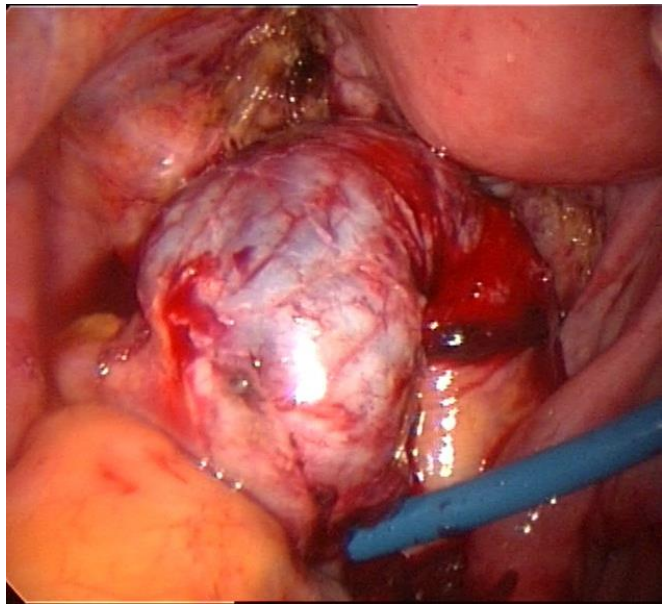



Always a stent  ?

repetitive stenting damages to the ureter which becomes a fibrotic tube

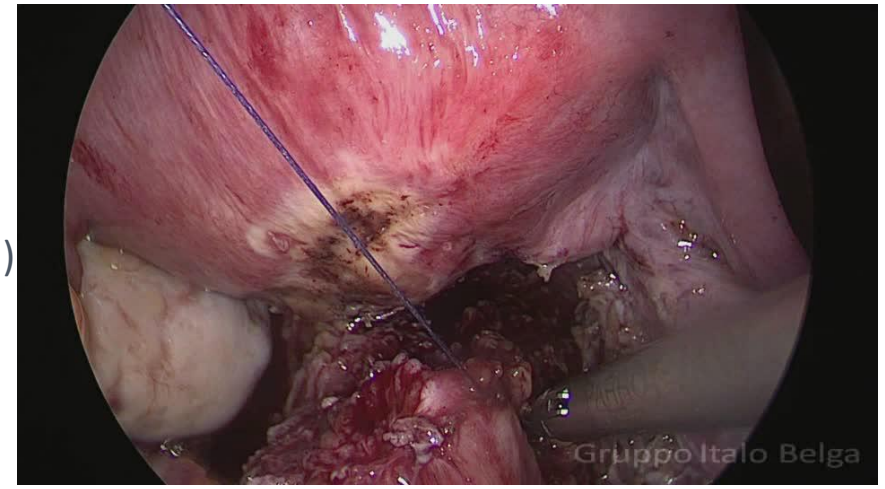
# After bowel Surgery

## 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

- if bowel was opened
  - Prevent contamination of upper quadrants
  - Lavage +++ (decreases bacterial load)
- Drain
  - If risk of infection : (macrophages cannot swim)
  - Can detect the first sign of bowel perforation



# Lavage

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

Ryan GB, Grobety J, Majno G. Postoperative peritoneal adhesions. A study of the mechanisms. Am J Pathol 1971;65:117-48

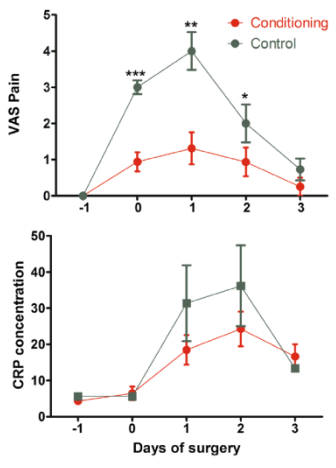
Polubinska A, Breborowicz A, Staniszewski R, Oreopoulos DG. Normal saline induces oxidative stress in peritoneal mesothelial cells. J Pediatr Surg 2008;43:1821-6.

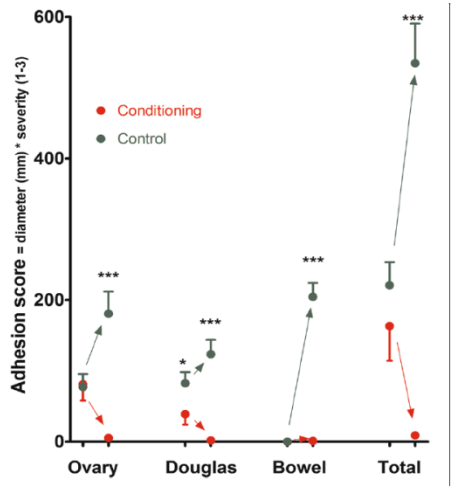
Polubinska A, Winckiewicz M, Staniszewski R, Breborowicz A, Oreopoulos DG. Time to reconsider saline as the ideal rinsing solution during abdominal surgery. Am J Surg 2006;192:281-5.

Breborowicz A, Oreopoulos DG. Is normal saline harmful to the peritoneum? Perit Dial Int 2005;25 Suppl 4:S67-S70.

- 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…

- Has been decided
  - Antibiotics
  - Catheter
  - ……
- Videoregisration
- Urinary retention

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

*Principles of postoperative care* *- some decisions were taken at the end of surgery*
*- postop care = clinic + CRP + standing orders*

# In the early nineties

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

After 3days – 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 recognise and therefore we missed*
*- and therefore we published*

Fu

Human Reproduction vol 11 no 10 pp 2263–2268, 1996

# Complications of $CO_2$-laser endoscopic excision of deep endometriosis

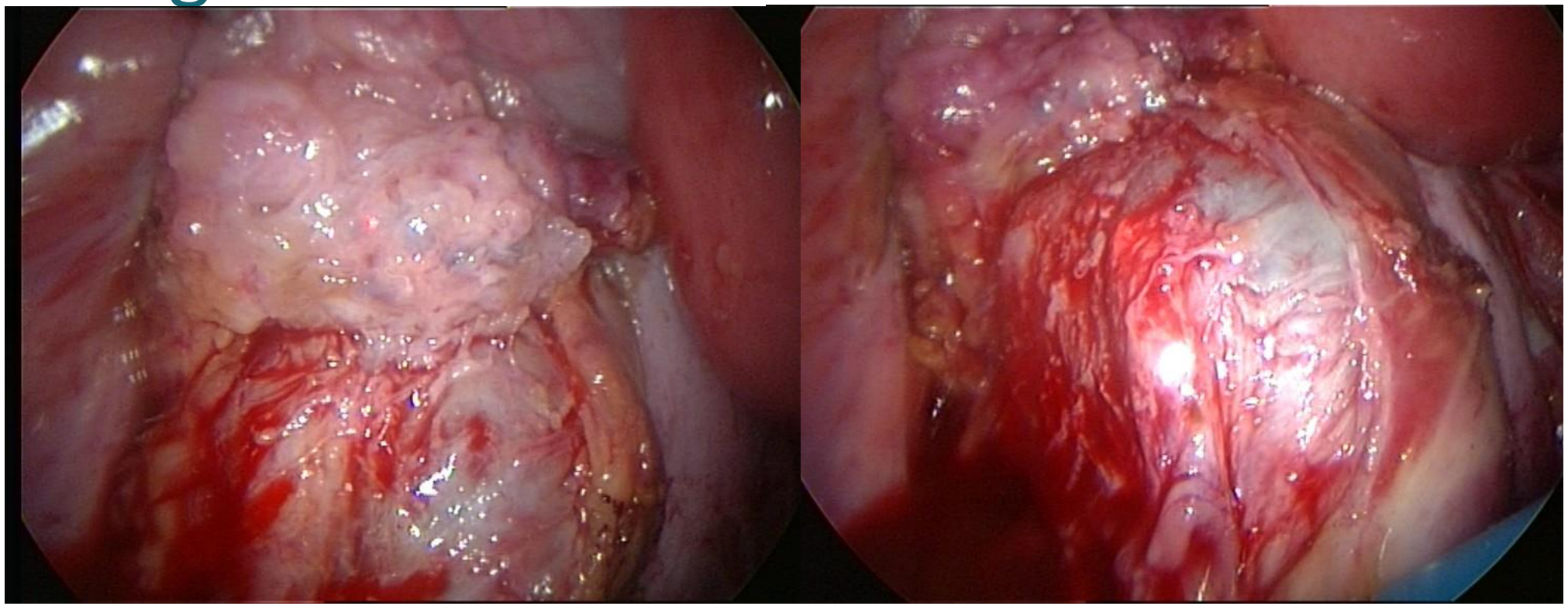
Philippe R.Koninckx[1,3], Brigitte Timmermans[1], Christel Meuleman[1] and Freddy Penninckx[2]

- 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 I. Deep endometriosis age of the women, indications for surgery and depth, volume and revised AFS score

| | Deeply infiltrating endometriosis | | | |
|---|---|---|---|---|
| | Type I ($n$ = 99) | Type II ($n$ = 55) | Type III ($n$ = 71) | Total ($n$ = 225) |
| Age (years)[a] | 32.1 (26 3–40 9) | 30 9 (26 1–38 1) | 29.5 (24.5–38 5) | 31 0 (25 0–39 4) |
| Depth (mm)[a] | 8 (6–15) | 11 (8–20) | 15 (8–25) | 10 (6–20) |
| Volume (ml)[a] | 2 2 (0 5–10 6) | 1 9 (0 5–12 3) | 4 3 (0 8–21 2) | 2.5 (0 5–12 6) |
| % in revised AFS | | | | |
| class I | 24.2 | 9 8 | 22 7 | 24 2 |
| class II | 40 0 | 41 2 | 36 4 | 40.0 |
| class III | 25.3 | 19 6 | 24 3 | 25 3 |
| class IV | 10.5 | 25 3 | 16 7 | 10 5 |

# Rectovaginal nodule



*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*

# Pubmed : bowel perforation AND Endometriosis

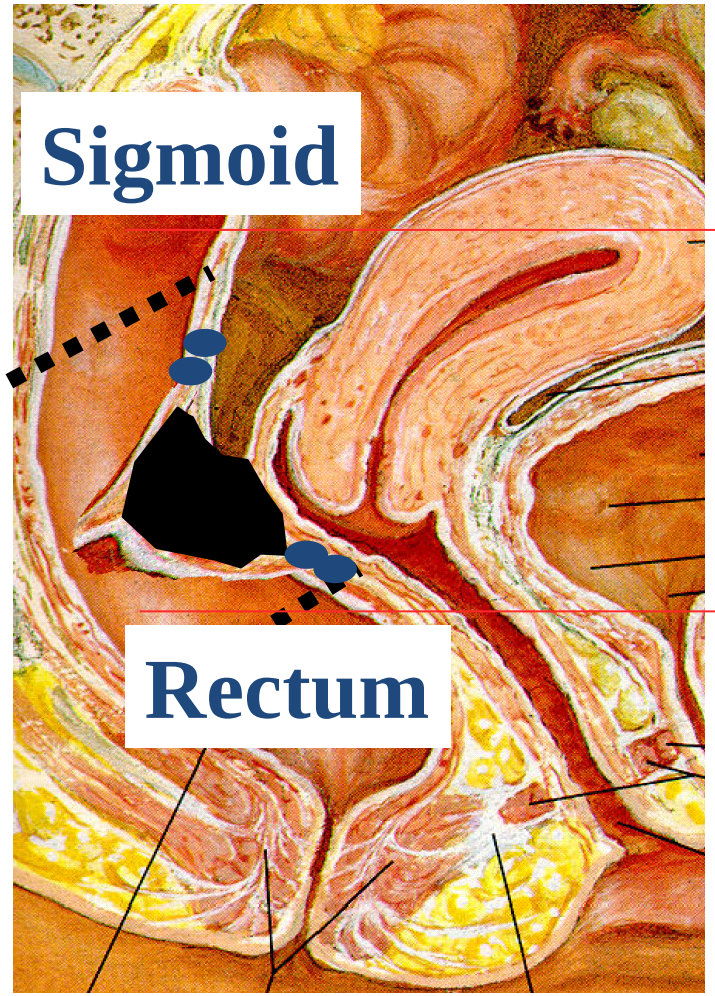
- N=0

# Pubmed : bowel leak AND Endometriosis surgery

- N=12
- **Late anastomotic leakage in colorectal surgery: a significant problem.** Morks AN[1], Ploeg RJ, Sijbrand Hofker H, Wiggers T, Havenga K. Colorectal Dis. 2013 May;15(5): : The incidence of early anastomotic leakage (EAL) within 30 days after surgery was 13%. The Late AL rate was 6%.
- Several articles discussing the need of prophylatic ileostomy : Is ileostomy always necessary following rectal resection for deep infiltrating **endometriosis**? Akladios C, Messori P, Faller E, Puga M, Afors K, Leroy J, Wattiez A. J Minim Invasive Gynecol. 2015 Jan;22(1):103-9.

*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

L Ret Davalos , de Cicco, D'Hoore, P Koninckx J Min Invas Surg 2007
a review of all cases since 1990 = > 10.000

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

*Incidence of leaks is high after low rectum resections which therefore should be avoided*

# Late bowel Perforation : symptoms

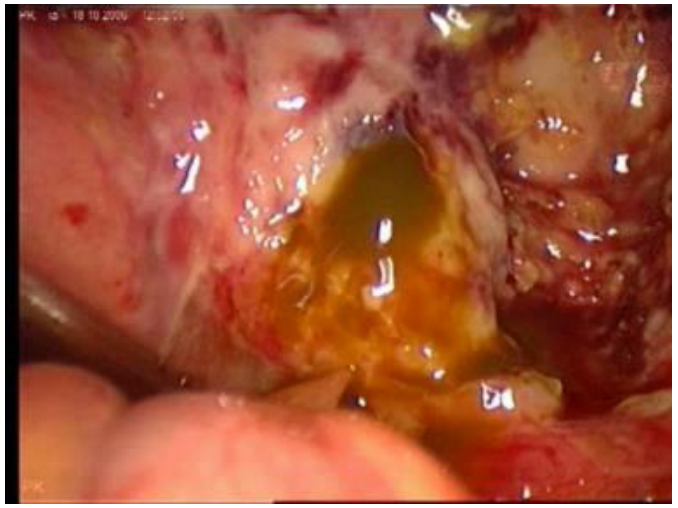
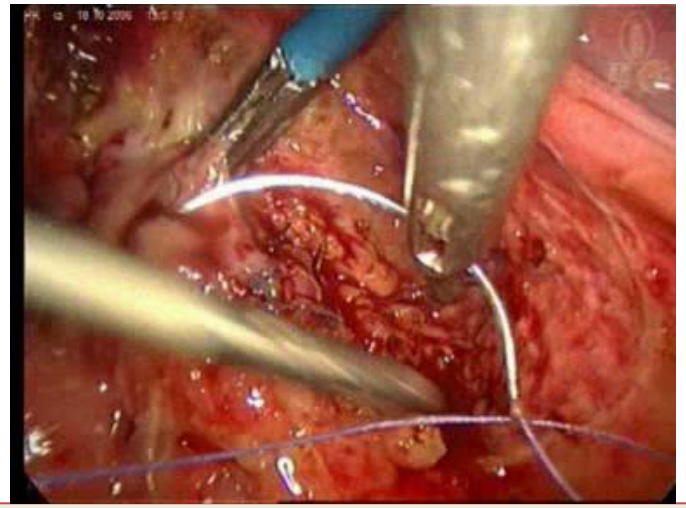
- Acute pain disappearing spontaneously
- No other clinical symptoms for 24 hours
- CRP : increases after 6-12 hours

*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.*

*What is the minimum time to develop a septic shock ?*

# Late bowel Perforation < 24 h

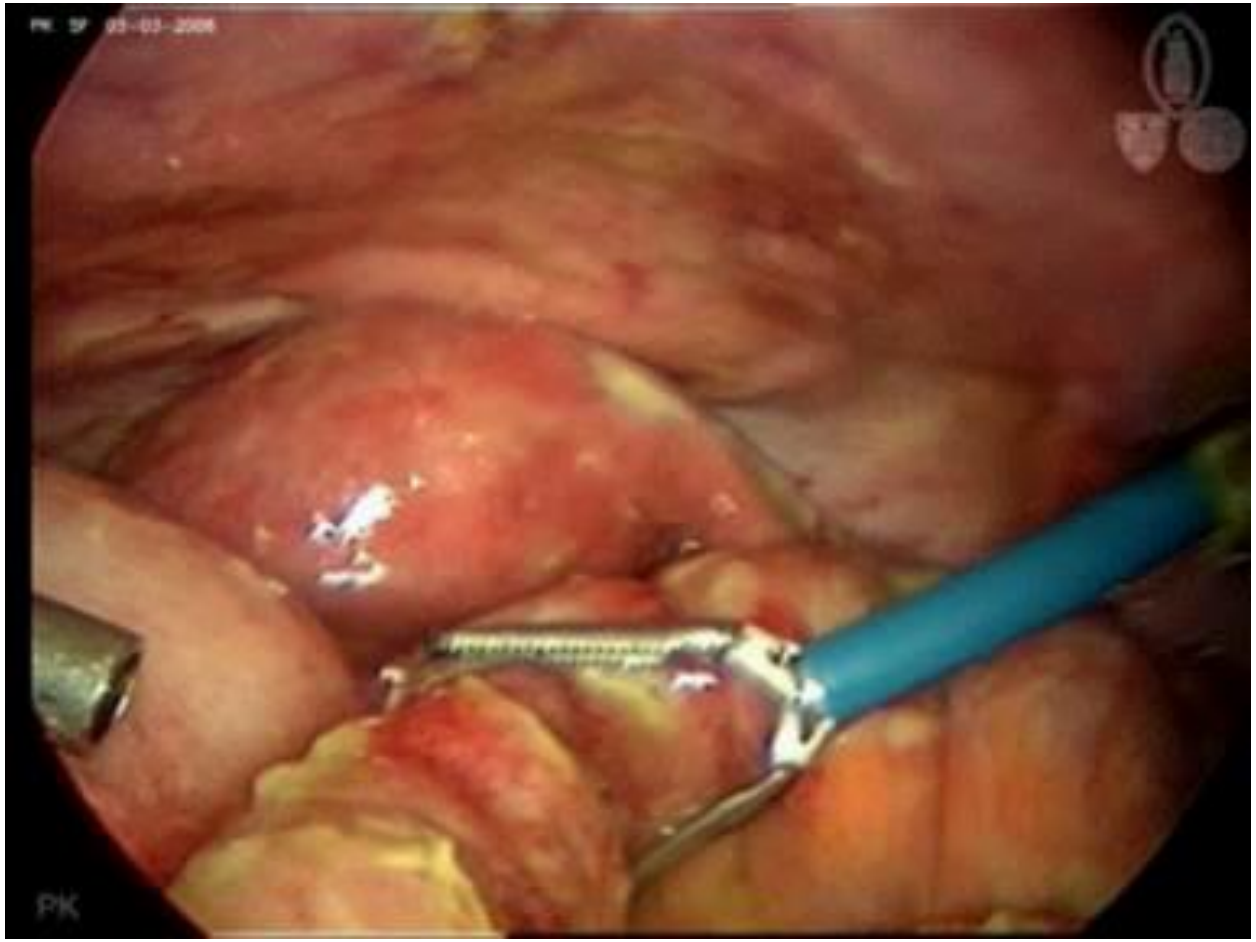
- If diagnosed within 24 hours
  - Suture in 2 layers
  - Extensive rinsing with 8 liters also above the liver
  - Antibiotics
  - 1 drain in the douglas, 1 drain in right colic gutter
- All of them were further uneventfull and were discharged 5-7 days later (some 50 in 1500 deep endometriosis patients)
  - 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
- Cafeful over and under liver
- Between all bowel loops to prevent abcedation
- Takes 1hour



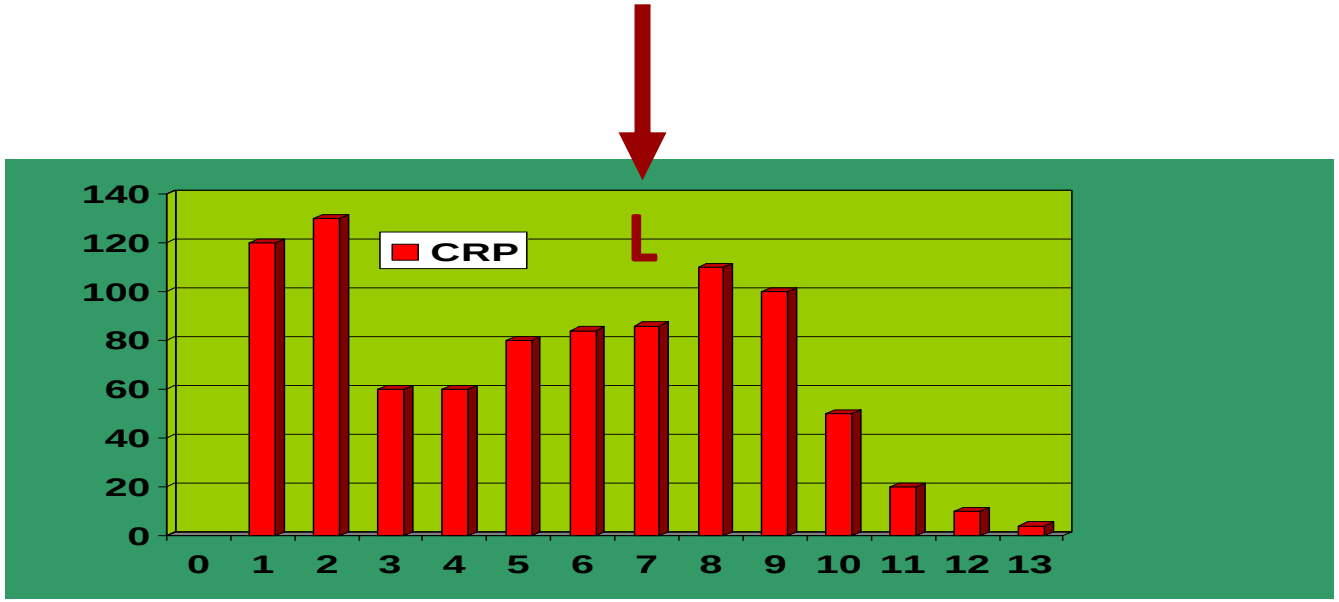
*See extensive fibrin = difficult surgery + repeated lavages*

# 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*

ATURNUS

# 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 , diarrea
- **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 disapppeared 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

Chapter 23

## Laparoscopic management and prevention of pelvic adhesions and postoperative pain

Philippe R Koninckx, Anastasia Ussia, Arnaud Wattiez, Rudy Leon De Wilde

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

Philippe R. Koninckx, M.D., Ph.D.,[a,b] Victor Gomel, M.D., Ph.D.,[c] Anastasia Ussia, M.D.,[b] and Leila Adamyan, M.D., Ph.D.[d,e]