Surgery for endometriosis

subtle endometriosis
typical endometriosis
cystic ovarian endometriosis
deep endometriosis
complications

Preoperative exams and diagnosis

Preoperative exams in any women, suspected of having endometriosis (i.e. with pain or infertility) an ultrasound and if pain, a menstrual clinical exam (see diagnosis) is mandatory. If arguments exist to suspect deep endometriosis, an IVP and contrast enema should be performed. These exams will permit to decide:

1. Whether a bowel preparation is given: mandatory if deep endometriosis is suspected.

2. Whether surgery should be scheduled as day surgery, or whether an hospitalization should be preferable

Whether cystic ovarian endometriosis should be planned as a 1 or 2 step procedure.

We consider additional exams such as MRI, CAT scans etc of limited additional value unless additional diagnosis is used to judge when a patient should be referred, thus preventing a prior diagnostic laparoscopy.
**Subtle endometriosis**

It remains unclear whether subtle endometriosis is a cause of pain and/or infertility. We think that subtle endometriosis is a physiologic condition occurring intermittently in all women. Therefore it is unclear whether it should be treated. Alternatively, there is no risk for treatment (see left, 2 laser shots of 0.5 seconds destroy subtle endometriosis): therefore we prefer to treat surgically since there is no risk, and a potential advantage.

**Typical endometriosis**

Typical endometriosis can be a cause of pain and infertility. Therefore destruction is advocated. We prefer to vaporize small superficial endometriosis or to excise the larger ones with a CO2 laser. A CO2 laser is preferred since it is faster than electrosurgery, uses to the maximum extent the haemostatic properties of the CO2 laser, has minimal tissue damage (100µm), and has the advantage of a bikini scar. (See incisions).

Diagnosis of cystic ovarian endometriosis is easily made by ultrasound.
It can be difficult to distinguish between a cystic ovarian endometriosis and a cystic corpus luteum. Therefore it should be judged and discussed with the patient. - Whether surgery is indicated: if a cystic corpus luteum is suspected, it is preferable to wait a few months and postpone surgery, at least if the patient has little pain. - Whether a bowel preparation should be given. - Which type of surgical treatment will be used: superficial vaporization, bipolar coagulation or excision of the cyst wall. The type of treatment is still slightly controversial today.

Our approach to cystic ovarian endometriosis is as follows:

Preop exams: Additional preoperative exams as MRI, CAT scan, or ultrasound +flow are not routinely performed since they give little additional information.

Bowel preparation: A simple cystectomy can be performed as day surgery without a full bowel preparation. If previous surgery was performed it can be wise to a bowel preparation. The dilemma is that the decision to have a bowel preparation implies that the patient has to be hospitalized, whereas the bowel preparation itself can be rather unpleasant. On the contrary when necessary and not given, the surgery cannot be performed safely and a second intervention has to be scheduled.

Type of Surgery
- Very small cysts can be vaporized
- Cysts larger than 1 cm will be excised, instead of being vaporized since the risk of recurrence is lower after excision.
- Cysts larger than 6 cm should be treated as a 2 step procedure, unless an ovariectomy is anticipated e.g. in older women. The first procedure is a 10 min procedure.
day surgery during which the cyst is opened, washed and drained, and the major visible endometriotic implants at the inside vaporized. Following 3 months of LHRH agonist treatment, a second intervention is performed during which the cyst wall is excised. If ultrasound after 3 months no cyst persist, and if the patient has no complaints, the second intervention can be cancelled. Excision of a large cyst in one step is technically not possible since the capsule of the ovary is too thin, and a cystectomy would generally destroy the ovary. Sometimes, when the cyst is located very excentrically, leaving the ovarian cortex entirely on one side, a cystectomy can be performed safely.

Deep endometriosis

Surgery for deep endometriosis is considered technically difficult surgery with in addition a substantial risk for complications, especially if performed without experience. The figures concerning results and complications given are derived from a series of more than 1,000 patients operated.

Recto-vaginal deep endometriosis

Diagnosis of deep endometriosis is made by clinical exam eventually menstrual clinical exam. If deep endometriosis is anticipated a full bowel preparation should be given. During surgery all endometriosis in the rectovaginal septum is excised. We believe this is mandatory since we consider deep endometriosis as a benign tumor. (See pathophysiology)

We prefer to excise completely deep endometriosis instead of a debulking (leaving part of endometriosis on the bowel), or a resection anastomosis. Debulking however, can be necessary when complete excision is considered too dangerous. Resection anastomosis is necessary when the bowel defect is so large that suturing becomes technically impossible. I had to do this 2 times over the last 14 years in over 1,000 patients.

This surgery will result for the larger lesions (see also complications) in

A. A partial resection of the vaginal wall in some 50%.
B. A resection of the rectum muscularis in 30 to 50%, necessitating suturing of the muscularis. In this case the hospitalization will be 3 to 4 days in order to detect late perforations immediately.
C. A resection of the bowel wall in 10 to 25% necessitating suturing in 2 layers and a hospitalization of at least 7 days

Sigmoid deep endometriosis
An infiltrating endometriosis at the level of the sigmoid cannot be diagnosed by clinical exam: the larger ones are diagnosed by contrast enema, which for this reason is performed systematically.
Surgery of the sigmoid infiltrating endometriosis can be technically very difficult, and even today it is unclear whether a discoid excision or a resection anastomosis is the preferred method. Since 1999 our approach is as follows. This surgery is discussed beforehand with the bowel surgeons who will be available if necessary. In principle a discoid excision will be performed; if the lesion reveals to be too large a resection-anastomosis is performed instead. The dilemma for this type of surgery is that a discoid resection, is simpler surgery and that a resection anastomosis always remains possible; it might however be less complete.

Bladder deep endometriosis
Some deep lesions infiltrate through the bladder wall. This surgery is generally not too difficult nor dangerous. Provided the surgeon is experienced in suturing, the bladder heals well. The patient has to carry a bladder drain for 7 days.
Over the last 10 years 1 case has been seen with a large nodule infiltrating the ureter and the complete segment through the bladder wall. In that case surgery is much more complicated, since a ureter reimplantation has to be performed.

Ureter deep endometriosis
Infiltrating endometriosis around the ureter occur frequently, sometimes leading to hydro-ureteronephrosis. This should always be known before surgery through the IVP X-ray. If a hydro-ureteronephrosis is present a pig tail stent will be placed in the ureter at the beginning of surgery. Dissection of the ureter is generally possible without too much difficulty since the endometriosis rarely infiltrate into the wall of the ureter. Occasionally however, part of the ureter wall or even a segment of the ureter has to be removed. This can be repaired by laparoscopy. Over the last decade I have in cooperation with the urologist sutured/anastomosed some 20 ureters. All have them healed well, except one postoperative leakage necessitating a second intervention during which a re-implantation was performed.

Postoperative Management
As postoperative management we feel it is important that any complication is recognized.
early, since an early repeat laparoscopy can usually treat these complications conservatively. As listed the complications comprise small bowel, rectum, ureter, bladder, and bleeding or infection. If 1 or 2 days are lost egg in the occurrence of a late bowel perforation, conservative treatment by laparoscopy is jeopardized, and a colostomy has to be performed. In those women that underwent bowel, ureter or bladder surgery the postoperative management is similar to what is always done following these interventions. In conclusion surgery for deep endometriosis is often unpredictable: most of the patients will be home the day after surgery, some 30 to 50% will stay for 4 days (muscularis lesion) whereas 10 to 20% will stay for 7 to 9 days.

**Complications of deep endometriosis surgery**

Severe complications such as fistulae, colostomy are rare but cannot be excluded. The risks seems to be around 0.5% for the most severe cases of endometriosis.

**Results of surgery**

Fertility: a global cumulative pregnancy rate of some 60 to 70% was found following, typical, cystic and deep endometriosis surgery. Pain: following deep endometriosis surgery, some 50% are pain free, whereas pain persist in 20%.

**Recurrence**

Typical endometriosis: 20 to 50%
Cystic ovarian endometriosis: 3 to 7%
Deep endometriosis: 1%

As summarized in 2 slides,

- Endometriosis is a surgical disease. Surgery is the preferred method of treatment if available.
- a CO2 laser is for us the preferred method of surgery.
- Typical endometriosis should be vaporized or excised.
Cystic ovarian endometriosis should be excised, unless very small when vaporization can be done, or very large (more than 6 cm) when a 2 step procedure should be planned.

Deep endometriosis should be completely excised, if technically feasible.

Complications of endometriosis surgery

Complications of laparoscopy

In the literature, several complications of laparoscopy have been described: such as lesions to the bowel or to the large vessels by insertion of the verres needle or trocar. The reported risk is one in 1000. In experienced hands, this risk is much lower. Over a period of 25 years, in over 10,000 laparoscopies, I never had a trauma to the large vessels. Twice a small bowel was perforated, who was strongly attached to the umbilicus. This could be sutured laparoscopically and the patients healed without further complications.

Endometriosis surgery

The risk of vaporisation or excision of superficial endometriosis (subtle and typical lesions) is probably close to zero.

Treatment of cystic ovarian endometriosis also carries little risk.

Deep and infiltrating endometriosis is surgery which is risk prone

- risk of damaging the ureters: therefore in case of doubt, and certainly if the preoperative exams show a hydrenephrosis, a stent will be placed before surgery. Over the years, we have seen several ureter injuries, most of which could be treated during surgery, whereas in some 10-15 a second laparoscopic intervention was necessary. In 1 case a second intervention by laparotomy was necessary to reimplant the ureter.

- risk of damaging the small bowel: we have seen 3 women with a late small bowel perforation. This probably must have been caused by manipulation of the bowel. treatment could be done by laparoscopic suturing of the bowel.

- risk to the rectum or sigmoid: as listed below complete surgery will need the removal of the muscle in 30-50% and of part of the bowel wall in 10-20%. This is not a complication but the patient has to stay in the hospital for 4 or 7 days respectively after this type of bowel surgery. After suturing the bowel, the risk of leakage after a few days is estimated around 5%. This can almost always be treated by a second laparoscopy during which the bowel is sutured. Over the years we have seen some 5 late (after 1 month) severe complications such as a fistula or a wall abcess. This generally requires a partial bowel resection and if accompanied by pelvic infection, a colostomy can be necessary to treat this safely.