

Debate concluded

Laparoscopic myomectomy today

Fibroids: management and treatment: the state of the art

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Introduction

Following the recent debate series on laparoscopic myomectomy (Dicker *et al.*, 1996; Dubuisson and Chapron, 1996; Nezhat *et al.*, 1996), this article sets out to summarize and analyse results for all different forms of treatment for uterine fibroids. These are common, benign, solid tumours of the genital tract and, depending on their size and location, can lead to hysterectomy. Advanced operative laparoscopy (Reich, 1989) and hysteroscopy techniques have been developed and large uterine fibroids can now be removed laparoscopically or hysteroscopically. In many cases, hysterectomy is suitable to avoid recurrence or to simplify the operative technique: laparoscopy-assisted subtotal (supracervical) hysterectomy (LASH), laparoscopy-assisted vaginal hysterectomy (LAVH), vaginal hysterectomy (VH) or abdominal hysterectomy. In other cases, myomectomy by laparotomy or by laparoscopy is suitable.

On the other hand, medication such as gonadotrophin-releasing hormone analogues (GnRHa) can be indicated in some instances in order to facilitate the surgical procedure and decrease the duration of hospitalization. Long-term GnRHa treatment and add-back therapy could be an alternative for inoperable patients. Possibly, in the future, other medication such as RU 486 or GnRH antagonists may produce the same effects as GnRHa.

The purpose of this article is to analyse these different treatments and results.

Conservative treatment

Conservative treatment includes laparoscopic myomectomy, laparoscopic myolysis, hysteroscopic myomectomy and myomectomy by laparotomy.

Laparoscopy

Laparoscopic myomectomy may be performed in selected cases, particularly in cases of subserous and interstitial myomas (Semm and Mettler, 1980; Nezhat *et al.*, 1991; Dubuisson *et al.*, 1992; Mettler and Semm, 1994). Before surgical

operation, the size, number and localization of the myomas is established by echography.

Preoperative treatment with gonadotrophin-releasing hormone (GnRH) is indicated in patients with myomas >5 cm in diameter and in patients with anaemia due to menorrhagia. Because of the risk of bleeding and problems of extraction, the indications depend on the number, size and localization of the myomas. In the view of Dubuisson *et al.* (1994), the procedure should not be attempted when more than four myomas are present or when a myoma of >8–10 cm in diameter is present.

Subserous and interstitial myomas are an indication for elective operative laparoscopy. Myomas situated in the broad ligament or at the uterine isthmus can also be treated by laparoscopy, taking care not to damage the ureter and the uterine vessels.

The myometrium is closed in one or two layers to prevent uterine rupture in case of pregnancy. Barrier materials (Interceed[®], Goretex[®]) can prevent adhesion formation at adnexal and uterine incision sites, and may be used at the completion of the laparoscopic procedure.

For myoma extraction, the Steiner morcellator (Storz, Germany) offers the advantage to avoid minilaparotomy or culdotomy.

Laparoscopic myolysis with the Nd YAG laser was considered for the first time in 1989 (Nisolle *et al.*, 1993) as an alternative to laparoscopic myomectomy if myomectomy is judged to be too difficult or not mandatory, or in cases of multiple intramural myomas to avoid a time-consuming laparoscopic myomectomy. Indications for myolysis are (Nisolle *et al.*, 1994): (i) pelvic pain (caused by myoma), (ii) compression symptoms, (iii) global uterine volume between 9 and 12 weeks (in order to avoid hysterectomy).

The aim of this technique is to provoke a strong coagulation of the myoma by introducing the Nd-YAG laser bare fibre into the central part of the fibroid. The fibroids treated by myolysis ranged from 3 to 8 cm in diameter. The mean decrease in the myoma diameter after myolysis was 41% after 6 months. In our preliminary series of 48 patients (Nisolle *et al.*, 1993), 15 patients were evaluated by echography after 3 years. In 10 of them, who had two to three myomas (between 3 and 5 cm in diameter), echography revealed only small areas (<1 cm in diameter) whose echographic structure was slightly different from the normal myometrium. There was neither any further decrease in size nor a regrowth of the myoma and required a laparoscopic subtotal hysterectomy (LASH). Among the five remaining patients, three were stable and two showed a reappearance of myomas in other sites. However, one of the major complications is the presence of dense and fibrous adhesions which were observed at second-look laparoscopy between the myoma and, most frequently, the small bowel

and/or epiploon (Nisolle *et al.*, 1993). In order to reduce the risks of adhesions, Interceed® or Goretex® may be placed on the coagulated areas. New modalities such as laser fibres (ITT fibres) and bipolar coagulation needles are now being evaluated.

In the case of a polyfibromatous uterus (more than four myomas) or the presence of a large myoma (>8 cm), a myomectomy by laparotomy must be proposed (Dubuisson *et al.*, 1992). When there is a continued desire for pregnancy, a careful suture of the myometrium is made using two layers of stitches. The serosa is stitched using 6/0 sutures. We end by covering the scar surface with Interceed® or Goretex® in order to avoid adhesions.

We have never used a pharmacological technique (injection of vasopressin) on the serosa and/or myometrium overlying the fibroid before making the uterine incisions, or a mechanical technique (Penrose drain) occluding the uterine vessels and the infundibulopelvic ligaments, in order to reduce operative blood loss. Total blood loss is directly related to the preoperative uterine size, the total weight of the fibroids removed, and the operating time (Ginsburg *et al.*, 1993).

Hysteroscopy

A hysteroscopic myomectomy using the electrosurgery (resectoscope) (Hallez *et al.*, 1987; Loffer, 1988; Neiss, 1996) or the Nd YAG laser (Donnez *et al.*, 1989, 1995) may be performed in cases of submucosal myomas.

Hysterosalpingography must always be done in order to classify the submucosal fibroids.

The following classification (Donnez *et al.*, 1994) permits adaptation of the surgical technique to the type of myoma:

(i) Type 1: submucosal fibroids whose greatest diameter is inside the uterine cavity.

(ii) Type 2: submucosal fibroids whose largest portion is located in the myometrium.

(iii) Type 3: multiple (>2) submucosal fibroids (myofibromatous uterus with submucosal fibroids and intramural fibroids) diagnosed by hystero-graphy and echography.

All the women were treated with GnRH prior to surgery in order to reduce the size of the myomas and facilitate the surgical procedure. Injection of GnRHa (depot formulation) was systematically administered at weeks 0, 4 and 8. Hysteroscopic myomectomy was carried out at 6 or 8 weeks (Donnez *et al.*, 1994). The use of GnRHa produced a reduction in

diameter of 35%. In our experience, 10% of myomas do not respond to GnRHa, probably because of either the lack of fibroid receptors (Donnez *et al.*, 1994, 1995), or poor vascularization (Donnez *et al.*, 1994) or chromosomal anomalies (Brosens *et al.*, 1996). It has also been demonstrated that stromal tumour must be suspected if no response is observed. In our series of 287 sublocal myomas (type I), an incidence of 1% of stromal tumour was found.

The operation was easily performed after injection of GnRHa, because the myometrium overlying the myoma was less vascular and 'shrinkage' of the uterine cavity may have accounted for the relative ease with which the myomas could be separated from the surrounding myometrium.

In the case of large submucosal fibroids whose largest portion was located in the uterine wall, two-step surgery can be proposed. After 8 weeks of preoperative GnRHa therapy, partial myomectomy is carried out. The laser fibre can be introduced into the fibroid to a depth of 5–10 mm in order to induce a necrobiosis. GnRH agonist therapy is then administered for another 8 weeks. At second-look hysteroscopy, the myoma was found to protrude inside the uterine cavity and appeared very white and without any apparent vessels on its surface. Myomectomy may then be easily carried out. Results are recorded in Table I.

In the case of multiple submucosal myomas (class 3), the recurrence rate of meno-metrorrhagia is 25% and alternative non-conservative treatment must be then discussed with the patient, especially if she is >40 years and does not wish further pregnancies.

Non-conservative treatment

In the United States, hysterectomy is one of the most commonly performed surgical procedures (656 000 hysterectomies in 1987 alone) (Findlay, 1990). Approximately 70% are performed using the abdominal approach and 30% are performed vaginally (Kovak *et al.*, 1990). The most frequent contraindications to vaginal hysterectomy are: endometriosis (moderate or severe), previous Caesarean section, significant uterine enlargement or limited uterine mobility in a nulligravida, previous pelvic surgery, previous uterine suspension.

In many cases, careful examination of the pelvis by diagnostic laparoscopy reveals the absence of contraindications

Table I. Surgical procedures and long-term results to the site of myomas

Type of myoma	At surgery			1-year follow-up		2-year follow-up	
	Number of patients	Procedure successful	Procedure failed	Number of patients	Recurrence of menorrhagia (%)	Number of patients	Recurrence of menorrhagia (%)
Greatest diameter inside the uterine cavity	233	230	3 ^a	132	1 (1)	98	2 (2)
Largest portion located in the uterine wall	78	74	4 ^b	42	1 (2)	24	1 (4)
Multiple submucosal myomas	55	51	4 ^c	39	8 (20)	24	6 (25)

^aStromal tumour.

^bA third-look laser hysteroscopy allowed the removal of the myoma.

^cMyomectomy was not totally successful. In two cases, second-look laser hysteroscopy was successfully performed. In the other cases, vaginal hysterectomy was proposed and successfully performed.

to vaginal hysterectomy. In addition, a large proportion of patients are candidates for vaginal hysterectomy after adhesiolysis.

GnRHa may reduce the total uterine volume in patients with uterine leiomyomata by between 29 and 56% (Donnez *et al.*, 1989, 1990; Carr *et al.*, 1993; Liu *et al.* 1993; Mencaglia *et al.*, 1993; Cirkel *et al.*, 1994; Kiltz *et al.*, 1994). When hysterectomy is planned for the treatment of large myomas (myoma >10 cm), women should be pretreated with a GnRHa for at least 3 months, since shrinkage of the myoma should facilitate laparoscopic or vaginal hysterectomy. Preoperative therapy may also be used in women with an enlarged uterus of more than 13 weeks, in order to decrease its volume. Avoiding a laparotomy is better for the patient's comfort and may shorten hospitalization time, thus representing a significant cost-saving alternative (Bradham *et al.*, 1995).

In 1992, the results of the first series of a new type of laparoscopic subtotal hysterectomy were described. The very low complication rate was impressive. Thereafter, we proposed a LASH in case of:

- (i) An enlarged uterus with multiple fibroids (up to 13 week gestational volume) and a normal cervix (even in nulligravida).
- (ii) Failures of endometrial ablation and/or myomectomy (failure demonstrated by the recurrence of meno-metrorrhagia).
- (iii) A myomatous uterus in women who have a medical history of Caesarean section.
- (iv) Multiple submucosal myomas even if the uterine volume is <7 gestational weeks.

All patients had a normal cervical smear, colposcopy and hysteroscopic cervical canal evaluation.

The advantages of this technique are the short duration of surgery (about 60 min in experienced hands), and blood loss consistently <100 ml. We have never experienced any intraoperative complications such as bowel or ureteral injuries. Three cases of bladder injuries were reported. In our series of 482 cases, patients who underwent LASH reported much less discomfort than patients who underwent other types of hysterectomy. No patients required major analgesic drugs. They were able to move about very soon after LASH (the same day), just as those who underwent laparoscopic adhesiolysis, ovarian cystectomy or salpingoneostomy.

Are there alternatives to surgery?

For inoperable patients, long-term GnRHa treatment and add-back therapy could be an alternative, especially during the years immediately preceding the menopause. The most common secondary effects of GnRHa are vaginitis, hot flushes and bone loss (Bianchi *et al.*, 1995). The aim is to administer an oestrogenic and/or progestatic treatment during long-term GnRHa therapy to prevent this inconvenience. With the addition of hormone replacement therapy hot flushes and vaginitis disappear in most patients (Maheux *et al.*, 1992). For the treatment of myomas, hormone replacement therapy may be started in the 4th month of treatment. The association of the two steroids, oestrogen and progesterone, is more suitable (Audebert, 1993). The utilization of a high dosage of hormone replacement therapy, such as 0.625 mg of conjugated equine oestrogens and 10 mg of medroxyprogesterone acetate, may

offer better protection against bone loss (Friedman *et al.*, 1989) but can diminish the efficacy of the GnRHa therapy.

The use of a depot formulation of GnRHa makes treatment more practical for the patient (an injection each month); long-term depot formulation (3 months) may represent a further improvement if this becomes available.

In the future, other molecules such as GnRH antagonist (Bouchard *et al.*, 1995) and RU 486 (Kettl *et al.*, 1994; Reinsch *et al.*, 1994) and Danazol (Takebayashi *et al.*, 1995) should be evaluated in the treatment of fibroids.

Conclusion

Uterine fibroids are the most common benign tumours found in women of reproductive age. Depending on the site and size of the fibroids, they can be asymptomatic, but if symptomatic, the main symptoms are: haemorrhagic disorders, pain, lower abdominal complaints and symptoms arising from the displacement of adjacent organs. Depending on the location, uterine fibroids are diagnosed by means of bimanual examination and serous imaging techniques including ultrasound, hysterosalpingography, hysteroscopy or MRI. Only symptomatic fibroids should be treated. Laparoscopic techniques and the use of GnRHa before surgery improve the therapy of fibroids. A laparoscopic approach is better for the patient's comfort and reduces the hospital stay. Treatment with GnRHa will make subsequent hysteroscopic surgery easier. Fibroid and myometrial shrinkage facilitate complete excision. Endometrial atrophy and a diminished haemorrhagic tendency improve vision at the site of surgery and reduce distension medium consumption and the risk of fluid absorption. Anaemia related to menorrhagia can be relieved by 3 months of combined treatment with GnRHa and iron prior to scheduled surgery, irrespective of the method. In cases of non-significant reduction after 2 months of therapy, malignancy must be suspected and ruled out.

Finally, long-term GnRHa treatment and add-back therapy could provide an alternative for inoperable patients.

In the future, treatment using a GnRH antagonist, Danazol and RU 486 may provide some degree of improvement in fibroid therapy.

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