Second look after laparoscopic myomectomy

Jean-Bernard Dubuisson1, Arnaud Fauconnier, Charles Chapron, Gustavo Kreiker and Christian Nørgaard

Service de Chirurgie Gynécologique, Clinique Universitaire Baudelocque, CHU Cochin Port-Royal, 123 Bd Port-Royal, 75014 Paris, France

1To whom correspondence should be addressed

The goal of this study was to assess the risk of adhesions after laparoscopic myomectomy. To this end our enquiry was based on observations with a prospective collection of data. Between October 26, 1990 and October 1, 1996, 45 patients underwent a second look after laparoscopic myomectomy. Seventy-two myomectomy sites were checked. The overall rate of postoperative adhesion was 35.6% per patient. The rate of adhesions per myomectomy site was 16.7%. The factors which influenced the occurrence of an adhesion on the myomectomy site were posterior location of the myoma and the existence of sutures. The rate of adhesions on the adnexa after laparoscopic myomectomy was 24.4%. The factors which influenced the occurrence of adnexal adhesions were another surgical procedure carried out at the same time, the existence of adhesions prior to the operation and posterior location of the myoma. The rate of adhesions after laparoscopic myomectomy is low and the adhesions rarely involved the adnexa. We recommend that a second-look laparoscopy be carried out systematically after laparoscopic myomectomy in patients desiring pregnancy.

Key words: laparoscopic myomectomy/operative laparoscopy/postoperative adhesion

Introduction

Laparoscopic myomectomy is a recent procedure whose feasibility and reproducibility have now been definitely demonstrated (Daniell and Gurlay, 1991; Dubuisson et al., 1991; Nezhat et al., 1991; Hasson et al., 1992; Tulandi and Laberge, 1997). The short-term advantages of this technique are less discomfort in the postoperative period, reduced scarring, and a shorter hospital stay (Maïs et al., 1996). Provided that the surgeons are skilled, this operation, which involves no particular risk of short-term complications (Dubuisson et al., 1996b), offers encouraging preliminary results in terms of fertility (Dubuisson et al., 1996a; Darai et al., 1997). Provided that the patients are carefully selected, laparoscopic myomectomy is an attractive alternative to myomectomy via laparotomy (Dubuisson and Chapron, 1996).

One of the major disadvantages of myomectomy is the risk of postoperative pelvic adhesions. These adhesions can adversely affect fertility, give rise to pain, and increase the risk of ectopic pregnancy or even intestinal obstruction. Several studies have demonstrated that the risk of postoperative adhesions decreases when an operation is carried out using laparoscopic surgery rather than by laparotomy (Nezhat et al., 1990; Lundorff et al., 1991; Operative Laparoscopy Study Group, 1991). The goal of this study was to assess the formation of adhesions after laparoscopic myomectomy and to establish which factors tend to encourage them to occur.

Material and methods

Between March 31, 1989 and August 16, 1996, a total of 271 patients underwent laparoscopic myomectomy using a previously described technique (Dubuisson et al., 1993). Concerning the laparoscopic closure of the myoma’s bed, we most often used a sero-muscular plane with separate stitches of vicryl 3/0 or 4/0 (Polyglactine 910; Ethicon, Neuilly, France). After extraction of the myoma the last phase of the operation was copious abdomino-pelvic lavage using warm normal saline. No other kind of peri- or postoperative treatment was used to prevent adhesions (Dubuisson et al., 1995a). Forty-five of these patients were given a second look. During laparoscopic myomectomy the following information was systematically recorded: the number, diameter and type (pedunculated, subserous, interstitial) of the myomas removed; the type of suture (one or two planes; separate stitches or running suture); the existence of preoperative pelvic adhesions and the way they were treated; the existence of pelvic endometriosis and the type of treatment; associated surgical procedures.

For these 45 patients, the indications for the myomectomy, which were sometimes present in the same patient, were the following: infertility (n = 27; 60.0%); chronic pelvic pain (n = 13; 28.9%); haemorrhage which did not respond to medical treatment (n = 9; 20.0%); size >50 mm (n = 4; 8.9%); compression syndrome (n = 1; 2.2%). During the 45 second-look procedures, 72 myomectomy sites were checked. The check was carried out using the following surgical procedures: laparoscopy (27 patients, 60%; 46 myomectomy sites, 63.9%) and laparotomy (18 patients, 40%; 26 myomectomy sites, 36.1%). In 16 cases the laparotomy took place during Caesarean sections. The two other indications for laparotomy are hysterectomy and microsurgical tubocornual anastomosis.

These checks were carried out between October 26, 1990 and October 1, 1996. The mean delay between laparoscopic myomectomy and the second look was 14 ± 13.3 months (range 0.6–49.4). The indications for the second look were the following: systematic checks after myomectomy for infertility (15 cases; 33.3%); systematic checks after myomectomy without infertility (five cases; 11.1%); recurring myomas (five cases; 11.1%); check during treatment of ectopic pregnancy (one case; 2.2%); investigation of pelvic pain (one case; 2.2%); check during tubal ligature (one case; 2.2%); investigation of...
infertility after laparoscopic myomectomy (one case; 2.2%); checks during Caesarean section (16 cases; 35.5%).

During the second-look procedure we evaluated the existence, the location (myomectomy scar, adnexa, pouch of Douglas etc.) and the severity of the adhesions. The severity of the adhesions on the myomectomy scar was assessed according to the Operative Laparoscopy Study Group Classification (OLSG, 1991) (type 1: filmy avascular adhesions; type 2: dense or vascular adhesions; type 3: adhesions of the binding type). The severity of adnexal adhesions was assessed according to the American Fertility Society Classification (1988).

The following data were collected prospectively using a computerized database: the findings of the peroperative exploration and the type of procedure carried out during the myomectomy and during the second look; the patient’s past history and preoperative investigations; the follow-up after the myomectomy and any pregnancies which occurred.

Statistical analysis included the following tests: χ2-test, Yates’ corrected χ2, Fisher’s exact test and Student’s t-test. The significance level was set at P < 0.05.

Results

The mean age of the 45 patients who underwent a second-look laparoscopy was 34 ± 5 years (range 24–50). For these 45 patients the mean size of the largest myoma removed was 49 ± 24 mm (range 15–100). The mean size of the 72 myomas for which the former site was checked during the second look was 41 ± 22 mm (range 10–100). The mean number of myomectomies per patient was 1.8 ± 1.3 (range 1–8). The number of myomas removed per patient was the following: one (27 cases; 60%), two (seven cases; 5.6%) and three or more (11 cases; 24.4%). The myoma was interstitial in 25 cases out of 72 (34.7%), subserous sessile in 40 cases (55.6%) and pedunculated in seven cases (9.7%) (Table I).

At least one uterine suture was made in 31 patients (68.9%). The total number of sutured uterine incisions was 34 (47.2%). The methods used for the uterine suture were: separate stitches in one plane (26 cases; 76.5%); running suture in one plane (four cases; 11.75%); suture in two planes (separate stitches in the inner plane and running suture on the surface) (four cases; 11.75%). The suture was made 30 times out of 34 by laparoscopy (88.2%) and four times (11.8%) by minilaparotomy (Nezhat et al., 1994). The mean size of the myomas was significantly greater for patients who had a uterine suture (51.3 versus 28.3 mm; P < 0.001).

Nineteen patients (42.2%) underwent one or more surgical procedures associated with laparoscopic myomectomy. These laparoscopic surgical procedures were the following: lysis (16 cases; 84.2%); tubal plasty (four cases; 21.1%); ovarian cystectomy (four cases; 21.1%); salpingectomy (two cases; 10.5%); ligamentopexy (one case; 5.3%); tubal sterilization (one case; 5.3%).

The overall rate of postoperative adhesions was 35.6% (16 cases). This rate was only 26.9% (seven cases) for those patients who underwent laparoscopic myomectomy alone without any other associated laparoscopic surgical procedure (n = 26).

Adhesions were observed on 16.7% of the myomectomy sites (12 cases). No adhesions were observed on the scars for pedunculated myomas. If pedunculated myomas are excluded, adhesions were observed on 18.5% of the sites (12/65). The severity of the adhesions on the myomectomy sites, assessed according to the OLSG Classification (1991), was as follows: type 1: one case (1.4%); type 2: seven cases (9.7%); type 3: four cases (5.5%). The organs which were adherent to the myomectomy sites were: sigmoid (five cases; 41.7%); bladder (two cases; 16.7%); small bowel (one case; 8.3%); adnexa (two cases; 16.7%); epiploon (one case; 8.3%); pelvic peritoneum (one case; 8.3%); not specified (one case; 8.3%). In one patient both the sigmoid and the right adnexa were adherent to the myomectomy site. The risk of adhesions on the myomectomy scar was not significantly correlated to the size of the myoma (excluding pedunculated myomas) (42.1 versus 40.4 mm; P = 0.8). The rate of adhesions on the myomectomy scar did not differ significantly according to whether the myoma was of the interstitial type or subserous [20.0% (five cases) versus 17.5% (seven cases); P = 0.8]. The risk of adhesions seems to be greater when there was a uterine suture, but this difference was not statistically significant [23.5% (eight cases) versus 12.9% (four cases); P = 0.27]. However, in half the cases (two patients) where adhesions on the myomectomy site were observed in the absence of a uterine suture, the non-sutured hysterotomy was located close to another hysterotomy which was sutured.

The risk of adhesions was significantly associated with the location of the myoma. When the myomas were posterior, the risk of adhesions was 33.3% (10 cases) whereas the rate dropped to 4.8% (two cases) for myomas in an anterior or fundal location (P = 0.002).

The risk of adhesions on the myomectomy site was not significantly different when a laparoscopic surgical procedure was associated with the myomectomy [15.8% (three cases) versus 23.1% (six cases)].

The existence of pelvic adhesions prior to the operation did not increase the risk of postoperative adhesions on the myomectomy scar [11.5% (three cases) versus 19.6% (nine cases)].

The risk of adhesions varied according to the reasons for the second look. In the case of laparoscopic second look the rate of adhesions was 28.9% (11 cases). This risk was only of 4.5% (one case) when the second look was carried out during a Caesarean section but the difference was not significant.

The rate of adhesions involving the adnexa after laparoscopic myomectomy is 24.4% (11 out of 45 patients). For 11.1% of patients (five cases) these adhesions were bilateral. When no other surgical procedure was associated with laparoscopic myomectomy (n = 26) the rate of adhesions was only 11.5%.
We feel that the most important factors to be taken into consideration are the following. The methodology used in previously published work is not the same in the various series, which makes comparison of the results difficult. For example, assessment of the risk of adhesions is usually global (i.e. per patient) and does not take into account the number of sites checked. Furthermore, the results reported do not always take into account the type of adhesion observed. The risk of adhesions on the hysterotomy site is usually assessed but the same is not true for adnexal adhesions. It is not always specified whether the myomectomy was accompanied by an associated surgical procedure, which might contribute to the formation of postoperative adhesions. Finally, the need to carry out pelvic adhesiolysis during the myomectomy is not often mentioned.

Laparoscopic surgery is indicated only for selected patients (Dubuisson and Chapron, 1996). The choice of approach (laparotomy or operative laparoscopy) to carry out myomectomy is governed by a number of parameters (location, size and number of fibroids) which makes it difficult to compare populations. For example, whereas the mean size of the myomas in the MAMSG series of myomectomy by laparotomy (MAMSG; 1995) was 10 cm, it was 4–5 cm on average when the operation has taken place via laparoscopy (Mais et al., 1995; present study). Similarly whereas the mean number of myomas removed was 3.3 in the MAMSG series (MAMSG; 1995), it was 2.1 for Mais et al. (1995) and 1.8 in our experience.

The indications for the second look after myomectomy vary from one study to another. In our hospital a check was proposed systematically for all patients desiring pregnancy, whether or not there was a context of infertility. In one series of myomectomies using laparotomy, the second look was only used for patients who remained infertile (Berkeley et al., 1983). On the contrary another series of laparoscopic myomectomies checked patients who had become pregnant spontaneously after myomectomy (Stringer and Strassner, 1996). Only two studies were prospective with the systematic use of a secondlook procedure (MAMSG, 1995; Mais et al., 1995). Although the groups of patients in these two series are not at all comparable, the rate of patients with adhesions was 64% after laparoscopic myomectomy and 100% after myomectomy by laparotomy.

The modalities of the second look were not identical in all the series. We observed fewer adhesions on the myomectomy site during checks on the occasion of a Caesarean section than by laparoscopy (4.5 versus 28.9%). This difference can be explained by the fact that the modalities of this check result in a bias when selecting patients, indeed it is logical that the adhesion risk would be lower for patients who were checked during Caesarean section. This is in fact an artificially selected population of patients who became pregnant after laparoscopic myomectomy.

Despite the difficulties encountered when comparing the results of myomectomy series, we believe that laparoscopic surgery could help to reduce the risk of adhesions. In indications other than myomectomy, several studies in animals as well as humans have reported a reduced adhesion risk with laparo-
scopic surgery compared with laparotomy (Luciano et al., 1989; Nezhat et al., 1990; Lundorff et al., 1991; Operative Laparoscopy Study Group, 1991). This advantage of laparoscopic surgery over laparotomy is derived from the ‘natural’ preoccupation with microsurgical principles during laparoscopy (e.g. the creation of an internal operating field avoiding intraperitoneal contamination and desiccation, use of fine instruments and gentle handling of tissues (Gomel et al., 1996).

Our work has enabled us to recognize that certain factors significantly increase the risk of adhesions after laparoscopic myomectomy. The knowledge of these factors could help in future to limit the adhesion risk after laparoscopic myomectomy. Unlike what might be supposed, the risk of adhesions does not seem to be correlated with the size of the myoma. However, like Nezhat et al. (1991) we observed no adhesions in our series, as in others (Starks; 1988; Hasson et al., 1991; Verkauf, 1992; Tulandi et al., 1993; Diamond et al., 1996). This is an important point for laparoscopy where the uterine incision is always made over the myoma, unlike laparotomy where a single anterior uterine incision can be considered in order to carry out polymyomectomy even when there is a posterior myoma (Buttram and Reiter, 1981). When a surgical procedure is associated with the myomectomy, this increases the risk of adnexal adhesions but has no effect on adhesions on the myomectomy site. The existence of pelvic adhesions significantly increases the risk of postoperative adnexal adhesions, but has no effect on adhesions on the myomectomy site. Other studies have made the same finding (Jansen, 1988; Hasson et al., 1992; Diamond et al., 1996).

Renewed formation of adhesions could be linked with a constitutional or genetic factor (Hasson et al., 1992) and other, untested factors such as Chlamydia trachomatis infection.

These results highlight the question as to the utility of second-look laparoscopy after laparoscopic myomectomy. The first advantage of this operation is assessment of any postoperative adhesions and their treatment. In our series, as in others (Starks; 1988; Hasson et al., 1992; Tulandi et al., 1993; MAMSG, 1995) the second-look laparoscopy did enable complete lysis of adhesions after myomectomy. The efficiency of this lysis during the second look has been proved by third-look laparoscopies (Jansen, 1988). One possible advantage of

### Table III. Second look after laparoscopic myomectomy

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of patients</th>
<th>No. of sites</th>
<th>Patients with adhesions</th>
<th>Sites with adhesions</th>
<th>Patients with adnexal adhesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nezhat et al. (1991)</td>
<td>32</td>
<td>56</td>
<td>–</td>
<td>28 (50)</td>
<td>–</td>
</tr>
<tr>
<td>Hasson et al. (1992)</td>
<td>24</td>
<td>–</td>
<td>16 (67)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mais et al. (1995)</td>
<td>50</td>
<td>70</td>
<td>32 (64)</td>
<td>–</td>
<td>18 (36)</td>
</tr>
<tr>
<td>Stringer et al. (1996)</td>
<td>4</td>
<td>9</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Dubuisson et al. (present study)</td>
<td>45</td>
<td>72</td>
<td>16 (36)</td>
<td>12 (17)</td>
<td>11 (24)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>155</strong></td>
<td><strong>207</strong></td>
<td><strong>64 (41)</strong></td>
<td><strong>40 (19)</strong></td>
<td><strong>29 (19)</strong></td>
</tr>
</tbody>
</table>

Values in parentheses are percentages.

### Table IV. Second look after myomectomy by laparotomy

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of patients</th>
<th>No. of sites</th>
<th>Patients with adhesions</th>
<th>Sites with adhesions</th>
<th>Patients with adnexal adhesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkeley et al. (1983)</td>
<td>8</td>
<td>–</td>
<td>8 (100)</td>
<td>–</td>
<td>8 (100)</td>
</tr>
<tr>
<td>Starks (1988)</td>
<td>20</td>
<td>–</td>
<td>20 (100)</td>
<td>–</td>
<td>20 (100)</td>
</tr>
<tr>
<td>Tulandi et al. (1993)</td>
<td>26</td>
<td>–</td>
<td>26 (100)</td>
<td>–</td>
<td>20 (77)</td>
</tr>
<tr>
<td>MAMSG (1995)</td>
<td>27</td>
<td>54</td>
<td>&gt;25 (&gt;93)</td>
<td>37 (69)</td>
<td>28 (82)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>81</strong></td>
<td><strong>79</strong></td>
<td><strong>79 (98)</strong></td>
<td><strong>37 (69)</strong></td>
<td><strong>28 (82)</strong></td>
</tr>
</tbody>
</table>

Values in parentheses are percentages.
second-look laparoscopy (which still needs to be demonstrated) may be improved future fertility for patients, particularly if adnexal adhesions occur. Also, the second look enables the quality of the myomectomy scar to be assessed in patients who desire pregnancy. During this second-look laparoscopy a methylene blue test should be carried out to check for any uterine fistula (Nezhat et al., 1991; Dubuisson et al., 1995b). This procedure would perhaps enable patients with a poor-quality uterine scar to be detected and thus avoid the risk of uterine rupture (Harris; 1992; Dubuisson et al., 1995b). We therefore consider it logical to propose a laparoscopic check between 4 and 8 weeks for all patients who desire pregnancy after a myomectomy involving a suture.

The rate of adhesions after laparoscopic myomectomy was low in our series. The adhesions truly caused by the myomectomy itself seem to be rare and only exceptionally result in major adnexal adhesions. The laparoscopic approach for myomectomy seems to us to be capable of limiting the formation of adhesions both on the scar and on the adnexa, thus providing the best possible safeguard for the patient’s future fertility. A randomized trial comparing the rate of adhesions after laparoscopic myomectomy with that after myomectomy using laparotomy would be useful to demonstrate this point clearly. We think that a second look via laparoscopy should be systematically proposed to patients desiring pregnancy and who have sutured uterine scars, whatever the size. The advantage is that any adhesions after myomectomy can be eliminated and the strength of the scar assessed.

References


Received on October 20, 1997; accepted on May 11, 1998