Myomectomy and Adhesions

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Myomectomy a major cause of pelvic adhesion

• The risk of induce a mechanical infertility for removing a putative cause of infertility
• This discussion arise only for intramural or sub-serosal myomas (type 2 to 7)
• No discussion concerning the risk of intra-uteine adhesion after myomectomy
LAPAROTOMY or LAPAROSCOPY

- **Type of adhesion**
  - **Adhesion reformation**
    - Reformation of adhesions lysed during an adhesiolysis procedure
  - **Adhesion formation**
    - Formation of adhesion at the site of surgery
    - On the uterus: minor effects on subsequent fertility
  - **De novo adhesion formation**
    - Formation of adhesion on a site not concerned by surgery
    - On tubes and ovaries: potential major effects on subsequent fertility
TOPICS

1- laparotomy or laparoscopy
2- anti-adhesion agents efficacy
3- surgical technique
4- indications
→ 1990: myomectomy = laparotomy

→ First trials of laparoscopic myomectomies in different staffs (Bruhat, Nezhat, Reich, Dubuisson …)

→ Solutions to found: sutures and extraction of myomas

→ Dubuisson 1994: first reported series
Dubuisson 1994: first reported series

- Definition of the contra-indications
- Benefits in recovery duration ...
- And less adhesion

Comparisons: no randomization
- Done from 1995 to 2005
### Adhesion frequency after myomectomies by laparotomy

<table>
<thead>
<tr>
<th>studies</th>
<th>N Patients</th>
<th>adhesions/patient</th>
<th>adnexal adhesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starks, 1988</td>
<td>20</td>
<td>20 (100%)</td>
<td>_</td>
</tr>
<tr>
<td>Tulandi et al., 1993</td>
<td>26</td>
<td>26 (100%)</td>
<td>20 (77%)</td>
</tr>
<tr>
<td>MAMSG, 1995</td>
<td>27</td>
<td>25 (93%)</td>
<td>_</td>
</tr>
<tr>
<td>Bulletti et al., 1996</td>
<td>14</td>
<td>10 (71%)</td>
<td>_</td>
</tr>
<tr>
<td>Ugur et al., 1996</td>
<td>48</td>
<td>40 (83%)</td>
<td>31 (65%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>135</strong></td>
<td><strong>121 (90%)</strong></td>
<td><strong>51 (69%)</strong></td>
</tr>
</tbody>
</table>
LAPAROTOMY or LAPAROSCOPY

After laparoscopic procedure

<table>
<thead>
<tr>
<th>Studies</th>
<th>nb patients</th>
<th>adhesions/patient</th>
<th>adnexal adhesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hasson et al., 1992</td>
<td>24</td>
<td>16 (67%)</td>
<td>_</td>
</tr>
<tr>
<td>Mais et al., 1995</td>
<td>50</td>
<td>32 (64%)</td>
<td>18 (36%)</td>
</tr>
<tr>
<td>Bulletti et al., 1996</td>
<td>14</td>
<td>4 (29%)</td>
<td>_</td>
</tr>
<tr>
<td>Dubuisson et al., 1998</td>
<td>45</td>
<td>16 (36%)</td>
<td>11 (24%)</td>
</tr>
<tr>
<td>Takeuchi et al, 2002</td>
<td>51</td>
<td>15 (29%)</td>
<td>9 (18%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>184</strong></td>
<td><strong>83 (45%)</strong></td>
<td><strong>38 (26%)</strong></td>
</tr>
</tbody>
</table>

Laparotomy

| Laparotomy | 135 | 121 (90%) | 51 (69%) |
Limits and Bias

- No randomization
- Probably not the same cases
- Frequency # severity
- Quantification of adhesion

Recent studies confirm this “evidence”
Contra-incidation for Laparoscopic Myomectomies

- Done by Dubuisson in 1994
  - 4 myomas and 5 cm
- Can largely overpassed
  - An uterus up to 15 cm
  - Myomas up to 10 cm
  - No limitation with the number of myomas
  - A major question of training *
- Morcelation dilemma

2: Adhesions prevention agents

- Use of various products or devices to avoid the occurrence of adhesions
  - **On site**: just acting on the surgical site
    - **Barrier**: interceed, prevad, goretex
    - **Gel**: hyalbarrier, oxyspray
  - **Hydroflotation**: maintain an ascitis to prevent de novo adhesion formation
    - **Adept**, **Intergel**
Evaluation of efficacy

The best would be the percentage of pregnant patients $n$ months after surgery

- Other infertility factors
- Number of cases
- Major delay

It is logically replaced by a direct evaluation of adhesion frequency and severity

- Second look laparoscopy
- Subjective, score …
Adhesions prevention

- Products demonstrated as having an effect in animal studies
  - Interceed
  - Prevad
  - Adept
  - Sprayshield
  - HaylobARRIER
  - ...
• A total of 694 women undergoing laparoscopic or abdominal myomectomy. The presence of adhesions was assessed in 546 patients who underwent subsequent surgery.

• RESULT(S):
• There was a higher rate of adhesions in laparotomy without barrier (28.1%) compared with laparoscopy with no barrier (22.6%), followed by laparotomy with barrier (22%) and laparoscopy with barrier (15.9%).

• CONCLUSION(S):
• Oxidized regenerated cellulose reduces postsurgical adhesions. Cohesive adhesions reduction was noted in laparoscopy.
• Less adhesion during laparoscopy
OBJECTIVE: Evaluation of the hydrophilic resorbable film PREVADH™.

STUDY DESIGN:
- Laparotomic myomectomy >60mm in diameter, multicenter, randomized study.
- Second-look laparoscopy 10-20 weeks after the initial surgery.

RESULTS:
- Fifty-four patients (P-Group, n=28; R-Group, n=26). Significantly fewer P-Group patients developed adhesions to uterine incisions than R-Group patients (43% vs. 92%, P=0.001). Adhesions, which were confirmed by independent reviewers, were found in significantly fewer P-Group sites than R-Group sites (29% vs. 76%, P=0.001).

CONCLUSION: PREVADH™ significantly reduced adhesion incidence and severity after laparotomic myomectomy on site and the numbers of sites involved.
HYALOBARRIER

- **MATERIALS AND METHODS:**
  - laparoscopic myomectomy, randomized, crosslinked HA gel versus Ringer's lactate solution Second-look mini-laparoscopy 45-60 days after surgery and the adhesions were assessed according to a site-specific modified scoring.
- **RESULTS:**
  - The incidence of postoperative adhesions was the same in both groups, but anatomically significant adhesions and site-specific modified score was significantly reduced in Group A compared to Group B control group (31.8% vs 54.6% and 1.05 +/- 1 vs 2.27 +/- 2.5, respectively).
- **CONCLUSION:**
  - The use of auto-cross-linked HA gel confirms a protection on adhesion formation on myometrial wounds, although the degree of this effect appears to be weak.
• Seprafilm Adhesion Barrier in reducing postoperative adhesions after open surgical procedures and the difficulty with laparoscopic delivery.
• Multicenter, randomized, reviewer-blinded trial. 21 versus 20
• Randomization to treatment with (n = 21) or without (n = 20) Sepraspray Adhesion Barrier.
• Adhesions scores increased in both the control and Sepraspray Adhesion Barrier groups, with larger although non statistically significant increases noted in control subjects when evaluating for the anterior uterus, the posterior uterus, and the entire uterus.

CONCLUSION(S):  
• Laparoscopic application of Sepraspray Adhesion Barrier after myomectomy in this pilot study was associated with a trend toward a reduction in postoperative adhesion development,
SPRAYSHIELD™

- **DESIGN:** prospective, controlled, blinded, and randomized study, laparoscopic myomectomies
- second-look laparoscopy (SLL) was performed 8-12 weeks
- **PATIENTS:**
  - Fifteen patients participated in this study; nine patients were assigned to the SprayShield™ and six patients to the control group.
- **RESULTS:** No significant differences were found between the two study groups.
- **CONCLUSIONS:**
  - SprayShield™ is easy to use. No serious adverse event related to SprayShield™ was observed. Efficacy data are inconclusive regarding the performance of SprayShield™. Further studies are needed to better understand this performance.
• BACKGROUND:
• Gynaecological laparoscopic surgery outcomes can be compromised by the formation of de novo adhesions. This randomized, double-blind study was designed to assess the efficacy and safety of 4% icodextrin solution (Adept(®)) in the reduction of de novo adhesion incidence compared to lactated Ringer's solution (LRS).

• METHODS:
• 498 patients randomized, 330 were evaluable (160 LRS--75% myomectomy/25% endometriotic cysts; 170 Adept--79% myomectomy/21% endometriotic cysts). At study completion, 76.2% LRS and 77.6% Adept had ≥ 1 de novo adhesion. The mean (SD) number of de novo adhesions was 2.58 (2.11) for Adept and 2.58 (2.38) for LRS. The treatment effect difference was not significant (P = 0.909
Anti-adhesions agents: summary

- Most of the proposed ones are active in animal:
- In human, their efficacy is limited or not clearly demonstrated
- No studies permit to say which one is the best
Anti-adhesions agents: cost effectiveness

- 100 myomectomies
  - 100 euros per agent unit
  - 10000 euros of extracost
- IVF: 4000 euros /attempt
- If you would increase the chance of pregnancy by 3%, using AAA would be cost-effective
- Randomization of 1000 cases in each arm
3 - Surgical technique for myomectomy

- Is the surgical technique important
- What are the crucial points
Geneva study

- 20 centers
- Randomized
- ADEPT versus RINGER LACTATE (blinded)
- Second look laparoscopy
- Video recorded
- Evaluation by independent experts
- > 300 cases
Geneva study

- No or Minimal anti adhesion effect of ADEPT
- Major discrepancy in adhesions formation or de novo adhesion formation frequencies from one staff to the other
  - Adhesion formation (0 to 100 %)
  - De novo adhesion formation (0 to 80 %)
Surgical procedures

- Procedures that seems to induce adhesion
  - Extensive coagulation on serosa
  - **Number of knots**
  - **Number and/or length of uterine incisions**
  - **Site of incision**
  - **Duration of procedure**
  - **Blood loss**

- A major necessity of randomized studies to confirm that? Too difficult to organize

- **The microsurgical laparoscopic approach is mandatory**
Association between uterine repair at laparoscopic myomectomy and postoperative adhesions.

- **DESIGN:** Retrospective study/ 108 patients who underwent second-look laparoscopy after laparoscopic myomectomy /Interceed barriers were used for uterine repair at initial surgery in all women.
- **RESULTS:** Forty-one (38.0%) women had adhesions to their uterus at follow up. A protruding wound was significantly associated with postoperative wound adhesion (odds ratio, 2.53; p=0.02). The number of enucleated subserosal myomas (odds ratio, 3.29; p<0.001) and the diameter of the largest myoma (odds ratio, 1.05; p<0.001) were significantly associated with wound protrusion, which was a critical factor influencing adhesion.
- **CONCLUSIONS:**
- Postoperative wound adhesion formation seems to depend on uterine status immediately after laparoscopic myomectomy.
Suture de l'hystérotomie
The first method to avoid post myomectomy adhesion is not to perform a myomectomy!

- Myomas among a young patient without childbearing desire:
  - Myomectomy or medical treatment (Ulipristal)

- Myomas in an infertile patient
  - Are myomas the cause of infertility?

- Myomas in an infertile patient requiring IVF
  - Would myomectomy improve the IVF result? HYSCO 3D

- What is the cause in infertility (male or salpingectomy)
CONCLUSIONS

1. Is myomectomy necessary?
   1. The easiest myomectomy the less necessary

2. As much as possible do that by laparoscopy
   1. Do not respect the traditional contra-indications

3. An appropriate technique
   1. The less incision: several myomectomies through one incision
   2. Anterior incision
   3. Limited coagulation – sutures
   4. Continuous sutures for closing hysterotomies

4. Use of anti-adhesion agents
   1. One or two hysterotomies: barrier or gel
   2. More: hydroflotation