Laparoscopic myomectomy – the limits of laparoscopic management

Jon I Einarsson MD PhD MPH
Director of MIGS
Brigham and Women’s Hospital
Professor of Obstetrics, Gynecology and Reproductive Biology
Harvard Medical School
Disclosures

I have no financial relationships with a commercial entity producing health-care related products and/or services.
Myomectomy

- Surgical option of choice for women who want to retain their options for future fertility
- Laparoscopic myomectomy vs abdominal myomectomy
  - Quicker recovery
  - Shorter hospital stay
  - Decreased blood loss
  - Decreased adhesion formation (30% vs 90%)
  - Comparable pregnancy rate

Our data – LM vs. RALM

<table>
<thead>
<tr>
<th>289 women – 02/07-09/09</th>
<th>LM (n=115)</th>
<th>RALM (n=174)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min)</td>
<td>118.3</td>
<td>195.1</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>EBL (ml)</td>
<td>85.9</td>
<td>110.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Conversions to laparotomy</td>
<td>0</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Weight of fibroids (g)</td>
<td>201 (1-1473)</td>
<td>159 (8-780)</td>
<td>NS</td>
</tr>
<tr>
<td>Median n of fibroids</td>
<td>2 (1-21)</td>
<td>3 (1-16)</td>
<td>NS</td>
</tr>
<tr>
<td>Largest fibroid (cm)</td>
<td>7.5 (2.2-16.5)</td>
<td>7.3(3.1-13.8)</td>
<td>NS</td>
</tr>
<tr>
<td>Blood transfusions n(%)</td>
<td>1(0.9)</td>
<td>10(5.7)</td>
<td>NS</td>
</tr>
<tr>
<td>Hospital stay &gt;1 day n(%)</td>
<td>4(3.5)</td>
<td>29(16.9)</td>
<td>OR 5.73</td>
</tr>
</tbody>
</table>
Laparoscopic/robotic myomectomy – the standard approach

- We looked at all myomectomies at Brigham and Women's Hospital from 2009-2012
- 966 patients were identified
- There were 731 laparoscopic/robotic cases (76%) and 235 (24%) abdominal cases
- Conversion to laparotomy was required in 8 cases (1.09%)
  - mean number in converted cases, 9.75 vs 3.48, p = .003
  - mean weight in converted cases, 667.9 vs 259.25 g, p = .015
- Conversion was significantly associated with a uterine weight over 500 grams

J Minim Invasive Gynecol. 2016 Mar-Apr;23(3):352-7
Limits for surgical management

- We looked specifically at women who underwent AM, LM or RM for extreme myoma burden (weight > 434.6g or 7 or more fibroids)
- 659 women from 2009 to 2016
- Greatest myoma burden in AM (696g) vs LM and RM (586g)
  - 16.8 AM - 7.2 LM – 6.7 RM
- OR time longest in RM (239 min)
- Hospital stay longest for AM (mean 2.2 days)
- Myoma burden of 13 fibroids was associated with almost 2 fold risk of perioperative complications (OR=1.77, p=.009)
- Cumulative incidence of perioperative complications by weight was greater in RM cases as compared to AM and LM
- Cumulative incidence of perioperative complications for myoma count was lowest in AM compared to LM or RM

Jansen et al. J Minim Invasive Gynecol. 2018 Nov 1
Brief description of our technique

- Two parallel trocars on surgeon side
- Facilitates suturing – especially in the setting of a horizontal hysterotomy
- Inject dilute vasopressin subserosally – avoid using more than 10 units every 30 minutes
- We like to use large volumes, 20 units of vasopressin in 400 ml of saline – we inject 200 ml (10 units) at a time
- RCT just completed comparing blood loss in using 200 vs 60 ml of diluted vasopressin solution
  - No statistically significant difference in blood loss
Step 2 – Hysterotomy

- Carry the incision into the fibroid
  - find the right plane

- We prefer the Harmonic due to minimal lateral thermal spread

- A horizontal incision is preferred for suturing with two ipsilateral trocars

- Pick whatever incision direction that works best in that scenario

- Avoid fallopian tubes and major vessels
Step 3 – Fibroid extraction

- Rock and Roll
- Needs quite a bit of force
- Avoid entering the cavity if possible
  - will do this deliberately in women who have completed their childbearing
- easy to pluck out the submucosal fibroids this way
Tissue extraction

- This has changed drastically in the last several months
- In short, we do not use electronic morcellators anymore
- ALL tissue extraction methods are contained, whether through the vagina, umbilicus or a minilaparotomy
Potentially worse survival with morcellation

- Park et al. 2011: 56 consecutive patients treated for early stage uterine leiomyosarcoma at a South Korean referral hospital from 1989-2011

- 5 year disease free interval 50% vs. 79% morcellated vs intact

- 5 year overall survival 46% vs. 73% morcellated vs intact
Park study – morcellation group

- Procedures performed (n=25)
  - LAVH (18)
  - VH (1)
  - Myomectomy via minilaparotomy (5)
  - Laparoscopic myomectomy (1)

- What this study is showing is that any kind of uncontained morcellation (tissue disruption) of a LMS may worsen prognosis.
Specimen removal – all contained

- Uterus too large to fit out intact
  - Narrow introitus/poor access – morcellate via a minilaparotomy
  - Good vaginal access – place specimen in a bag and morcellate vaginally using a 10 blade knife and triple hooks
  - We do this for specimens up to 800g
Alternatives to Open Power Morcellation – ALL CONTAINED

Uterine weight = 3 dimensions on imaging in cm x 0.52 = weight in grams

- **<800g**
  - Nullip
    - Minilap
      - 15 mm endobag
    - Vaginal extraction
  - Parous

- **>800g**
  - Minilap
    - 15 mm endobag
  - 800-1500g
    - Alexis tissue extraction system
  - >1500g
    - Lahey bowel bag
Limits

- Surgeon experience
- Size
- Number
- Location

- What is the ultimate goal of surgery? Fertility preservation? Volume reduction
- Blood loss – will the patient accept a blood transfusion?
Surgeon experience

- Most important factor
- Move strategically and control the situation at all times
- Gradually build up
- Need high volumes (>30/year) to become really good
- Rapid suturing is important
Size

- The largest specimen weight for a myomectomy in our group is 3080 g
- Does not tell the whole story
- MUCH easier to remove one large fibroid rather than multiple small ones (raisin bread)
- Time for extraction can be excessive – a minilaparotomy may be advisable with manual morcellation with a 10 blade
- Also consider hand assisted surgery
Number

- Have removed over 60 fibroids in one patient, but our median number is 2 per case.

- Important to have a discussion with the patient about limitations. It is not always possible to remove all fibroids. Small ones may be left behind.

- Preoperative evaluation is very important for mapping.
Location

- Intramural vs submucosal vs intracavitary vs subserosal
- Cervical – watch out for uterines – clip at origin if necessary
- Broad ligament – usually pretty easy – open peritoneum and peel out – again stay away from major vessels
Preoperative evaluation

- MRI is obtained on most patients
- Delineates location, characteristics and size of fibroids
- Detects adenomyosis
- Helps with preoperative counseling and planning
Tips for limiting blood loss

- Use high volume vasopressin – 20 units in 400 ml of saline – inject 200 ml

- Use lupron preoperatively to build blood counts – may make dissection of fibroids more difficult IF the fibroids are already necrotic

- Be quick

- Avoid making an incision close to ascending uterines

- Use clips on the uterine arteries

- Consider preop embolization

- Consider using cell saver
Case in point

- 39 y/o G0 – Jehovah's witness
- Heavy bleeding despite Lupron for 6 months
- H/H 9/29 despite repeated iv iron infusions
- Wants pregnancy in near future
- Multiple fibroids on imaging, overall uterine size 19.5x17.2x8.6cm – 10 cm intracavitary fibroid – total uterine weight approx 1500 grams
- EMB benign
In Summary

- Laparoscopic myomectomy has become the standard of care for removal of uterine fibroids at our institution

- With adequate surgical volume, laparoscopic myomectomy can be performed effectively and safely, even in a large institution with multiple surgeons

- Mastering laparoscopic suturing is the most important factor in being able to perform laparoscopic myomectomy
Thank you