Laparoscopic management of fibroids and tissue extraction options

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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

<table>
<thead>
<tr>
<th></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;0.0001</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
## More details from 2009-12

<table>
<thead>
<tr>
<th>966 women - 2009-2012</th>
<th>AM (n=237)</th>
<th>LM (n=385)</th>
<th>RALM (n=340)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time (min)</td>
<td>135</td>
<td>122</td>
<td>190</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>EBL (ml)</td>
<td>185</td>
<td>87</td>
<td>79</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Any post op complication</td>
<td>12.2%</td>
<td>5.9%</td>
<td>9.4%</td>
<td>0.02</td>
</tr>
<tr>
<td>Median n of fibroids removed</td>
<td>8.5</td>
<td>2</td>
<td>2</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Mean total weight of resected fibroids (g)</td>
<td>593.9</td>
<td>302.8</td>
<td>218.4</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Entered cavity</td>
<td>46%</td>
<td>13.2%</td>
<td>27.1%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Length of stay (median (d))</td>
<td>2.0</td>
<td>0</td>
<td>1</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>
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 1- Vasopressin injection
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
Hysterotomy closure - video
Hysterotomy closure – baseball
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
Tissue extraction

- More abdominal hysterectomies are being performed these days

- A recent study of 18,299 revealed:
  - utilization of LH had decreased by 4.1% 8 months after the FDA safety communication
  - Major surgical complications (excluding transfusions) significantly increased
  - Rate of hospital readmissions within 30 days significantly increased

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
- LMS treated from 1969-2005
- TAH (21) vs. “tumor injury” (16)
  - Abdominal myomectomy (4)
  - LH with morcellator knife (2)
  - Hysteroscopic myomectomy (4)
  - Subtotal AH (4)
  - TAH, injury with sharp instrument (2)
- Age range 30-74 (mean 50)
- Again, this study is not evaluating laparoscopic morcellation

**Tumor Injury (A)**

- 62% mortality

**No Injury (B)**

- 38% mortality

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Perri T, Int J Gynecol Cancer 2009;19:257-60
Recent study from Spain

- 37 cases of sarcoma in 4014 patients undergoing surgery for presumed fibroids (0.9%)

- Increased disease free survival in laparotomy group vs. morcellation group (70.3 vs. 10.4 months, \( p = 0.18 \))

- Median DFS was 6.3 months in laparoscopic morcellation cases, 11.9 months in vaginal fragmentation cases and 149.9 months in nonmorcellated cases (\( p < 0.002 \))

- Median age was 40 (range 26-83 years)

Cusido M et al. JMIG 2015 22, 1068-1074
Identifying at risk patients

- **Age:** Peak age for LMS is at approx age 50 with a wide age range

- **Clinical Presentation:**
  - Rapidly enlarging uterine mass, severe pain and heavy bleeding NOT reliable predictors
  - New or enlarging uterine mass in postmenopausal woman warrants evaluation
Identifying at risk patients

- Imaging;
- MRI seems to be the best bet, but far from perfect
- 2 studies
  - Goto et al – MRI plus LDH
  - Sato et al – MRI with DWI (diffusion weighted imaging)
Prospective study of 227 patients diagnosed with smooth muscle tumor
- From 1990-2000
- 10 patients with LMS (4.4% incidence?)
- 130 patients with degenerated fibroid
- 87 with regular leiomyoma

Combination of contrast enhanced MRI and LDH (total plus LDH-3) had a sensitivity and specificity of 100%

However, if the incidence of sarcoma is 1/500, the PPV is only 3%
Sato et al.

- 10 lesions from 5 patients with LMS
- 83 uterine fibroids in 76 patients
- Classified into low risk and high risk based on findings from DWI
- Sensitivity 100%, specificity 94%, PPV 66.7%, NPV 100%
- Preliminary data based on very few patients; requires a larger study for a more robust evaluation
- Again, if the incidence of sarcoma is 1/500 the PPV is only 4.7%

Specimen removal – all contained

- Uterus too large to fit out intact
  - Narrow introitus/poor access – morcellate with electronic morcellator inside an endobag or via a minilaparotomy
    - We now only use 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 1500g
In bag morcellation (IBM)
Contained tissue extraction - minilaparotomy
Contained tissue extraction - transumbilical
Contained tissue extraction - transvaginal
Alexis contained tissue extraction system
**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
Video
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