Myoma
Diagnosis and treatment

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PART 1
Diagnosis

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Proper diagnosis of fibroids?
What do we have to know

1. Cavity involvement
2. Number of myomata
3. Endometrial vascularisation
4. Size and location
One Stop Uterine diagnosis

- Ultrasound
  - Distortion of homogenous myometrium?
  - Endometrial Lining?
- Fluid Mini-Hysteroscopy
  - Cavity form?, Endometrium?, Cervical canal?
  - Subtle lesions?
- Kontrast sonography
  - Cavity form?
  - Measure Intracavitary lesions.

Ambulatory endoscopic unit

One Stop Uterine diagnosis

1. Ultrasound
   - Myometrial changes?
**One Stop Uterine diagnosis**

2. Hysteroscopy
   - Cavity form?
   - Endometrium?
   - Subtle lesions?

3. Kontrast sonography
   - Cavity form?
   - Measure Intracavitary lesions.

**Proper diagnosis of fibroids**

- Ultrasound
- Hysteroscopy
- Contrast sonography

**Supplementary exams necessary?**

When?
1. dd adenomyoma – myoma
2. Multiple myoma
3. Diffuse enlargement of uterine wall

How?
1. NMR imaging
2. Hysteroscopic exploration
1. MRI

MRI divides Myometrium in 2 structural and functional different entities

- small central zone of increased density
- Junctional zone
- Larger outer hypodenser zone
- Outer myometrium

Junctional Zone Myometrium

Functional important entity in reproduction
- Ontogenetically related to endometrium
- Cyclic changes in SSH receptors
- Role in gamete transport and implantation
- Early changes from time of implantation

Submucosal Uterine Fibroids differs from subserosal fibroids

- Less cytogenetic abnormalities
- Pattern of vascularisation
- Expression of SSH receptors
- More responsive to GnRH analogue
- Fewer recurrences after surgery
Effect of Uterine Fibroids on IVF

Outcome

**Subserosal**
- Fahri 1995 normal
- Elder-Garcia 1998 normal
- Healy 2000 normal
- Oliveira 2004 normal

**Submucosal**
- Fahri 1995 decreased
- Elder-Garcia 1998 decreased
- Healy 2000 decreased

Conclusion: no effect unless the cavity is involved?

Effect of Uterine Fibroids on IVF

Outcome INTRAMURAL ????

- Fahri 1995 normal
- Stovall 1998 decreased
- Elder-Geva 1998 decreased
- Ramzy 1998 normal
- Healey 2000 decreased
- Hart 2001 decreased
- Surrey 2001 normal
- Check 2002 probably decreased
- Ajayi 2003 decreased
- Oliveira 2004 normal, if < 4cm

Is intramural fibroid a misnomer?

Endometrium
- Superficial
- Basal

Myometrium
- Junctional zone (JZ) : the third uterine zone
- Outer myometrium (OM)

The intramural fibroid should be classified as either JZ or OM fibroid.
Findings at MRI: Myoma?

Normal JZ Myoma
OM Myoma JZ - OM Myoma

Findings at MRI: Adenomyosis - Adenomyoma?

Loss of differentiation JZ - OM
Normal

Enlarge the diagnosis?

2. Hysteroscopic exploration of the JZ myometrium in case of focal pathology.
Subtle lesions a sign for Junctional Zone Pathology?

Hysteroscopic Operative Myometrial Exploration

4 important conditions

- Ambulatory or office endoscopic unit
- Watery (Saline) distension medium
- Small diameter instrumentation with high optical quality
- Mechanical and Bipolar Surgery with atraumatic technique

Instrumentation

<table>
<thead>
<tr>
<th>Instrumentation Type</th>
<th>Diameter 1</th>
<th>Diameter 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>30° rod lens optic</td>
<td>2.0 mm</td>
<td>2.9 mm</td>
</tr>
<tr>
<td>Operative 5 Fr. single flow sheath</td>
<td>3.6 mm</td>
<td>4.3 mm</td>
</tr>
<tr>
<td>Operative continuous flow sheath</td>
<td>4.2 mm</td>
<td>5.0 mm</td>
</tr>
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</table>
5 French Mechanical probes

5 French Bipolar probes

DD

JZ myoma - adenomyoma – cyst

Focal subendometrial myometrial pathology seen at MRI

Subtle lesions
JZ Myoma

Adenomyoma

Subtle lesions and adenomyosis?
Resection of adnomyotic cyst

coagulation of adnomyotic cystic wall
PART 2
Treatment
Hysteroscopic myomectomy

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The ESGE* classification of submucous myomas

<table>
<thead>
<tr>
<th>TYPE 0</th>
<th>TYPE 1</th>
<th>TYPE 2</th>
</tr>
</thead>
</table>

Preoperative Examinations
- Ultrasound
- Contrast sonography
- Hysteroscopy
- M.R.I.?

Hysteroscopic Myomectomy

Operative risks are related to
- Location (% intramural part)
- Numbers of myomas
- Surgical technique
- Distension fluid
- Size
- Endometrial vascularisation
Hysteroscopic Myomectomy

Surgical technique
- Surgery only under clear vision
- Coagulation of major vessels
- Concomitant ultrasound or laparoscopy available
- Intramural resection
  without destroying the surrounding myometrium
  minimal myometrial safety margin of 5 mm

Reducing operative risk by GnRH-a therapy?

AIM
- Induction of amenorrhoea
- control any concomitant menorrhagia
  correction of pre-operative anaemia
- Reduction size of the fibroid(s)
- Reduction in total uterine volume

Reduction in volume of the fibroids?
Combined medical - surgical approach

<table>
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<tr>
<th>GnRH-a treatment</th>
<th>Surgery</th>
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<tr>
<td>Day 25</td>
<td>4 weeks</td>
</tr>
<tr>
<td>↓</td>
<td>8 weeks</td>
</tr>
<tr>
<td>↓</td>
<td>10 – 12 weeks</td>
</tr>
</tbody>
</table>

GnRH-a treatment should be phase one of a two-phase treatment plan for uterine fibroids followed by surgery.

Indications
- Myoma larger than 2 cm
- Anaemia

Relative Indications
- More than one sub-mucous myoma
- Myoma localisation
- Endometrial vascularisation

Distention medium
Hysteroscopic Myomectomy

Distension fluid
Monopolar surgery using non-ionic solutions
s.a. manitol, sorbitol or glycine has higher risk of
side effects due to fluid overload effect.
Stop surgery as soon as 1 L of fluid losses
Bipolar surgery using ionic solutions (saline)
Isotonic hyperhydration is less dangerous
In young patients up to 4 L of losses can be
accepted

Always use a pressure and
flow controlled pump
system to work at minimal
necessary pressure
Always perform continuous
fluid balance independently
of the medium used

Operative Hysteroscopy
instrumentation
5 French Bipolar probes

VERSAPOINT

Classical approach for myoma and polyp

Resectoscope
Unipolar polyp and myomaresection
Non ionic fluid

Unipolar myoma Typ 1 resection

Versapoint approach for myoma
Ionic fluid
Bipolar resectoscope for myoma

Ionic fluid

Hysteroscopic Myomectomy

Bipolar resectoscope is recommended but
- Loop different shape and size
- Different surgical manoeuvres
- More bubbles
- Modern generator

Bipolar hysteroscopic myomectomy
Hysteroscopic Myomectomy

Long-term results depend on

- Uterine Size (P<0.001)
  - Number of myomas (P<0.001)
    The surgery-free percentage of 168 patients with normal sized uterus and not more than two myomas was 94.2% (+/- 1.8%) at 2 years and 90.3% (+/- 3.9%) at 5 years.
- Type (% intra-mural part)
- Size of myoma (significant increase of amount of particles between 2 and 3 cm)

Long-term results depend on the presence of concomitant pathology or is a result of incomplete surgery?


Conclusion Hysteroscopic Myomectomy

1. Junctional Zone Myoma should preferentially be treated by hysteroscopy.
2. Feasibility of hysteroscopic surgery is predominantly related with size, location and amount of myoma.
3. Independently of distension medium used continuous fluid balance and flow distension control is mandatory.
4. Complication risk is related to experience and surgical technique used.

PART 3
Treatment
Laparoscopic myomectomy

Joseph NASSIF, MD
Arnaud WATTIEZ, MD
Jaime FERRO, MD
Rudi CAMPO, MD
History

- Subserosal
  - Daniel 1991
  - Dubuisson 1991
  - Nazhat 1991
  - Hasson 1992

- Intramural
- Less adhesions?
  - Bulletti
  - Dubuisson 1996

- 70’s
- 90’s
- 1996

- Laparoscopic myomectomy substantial changes
  - Indications
  - Surgical technique per se
  - Methods used to reduce bleeding intra-operatively

Indications and limits

- Subserosal (relative), intramural or broad ligament myoma
- Infertility or bleeding disorders
- Diameter < 10 cm
- Number < 3 or 4
- Sum of diameters < 14 cm
- Other parameters: age, association to submucous myoma, ...

- A recent increase of size is not longer an indication
  - Critchley HO, Fertil Steril 2007; 87: 466–76.
- Pre-operative diagnosis of myoma
  - N = 1332
  - Uterine sarcoma = 2 to 3 / 1000
  - Not more frequent in the group where recent increase in myoma size is reported

Data review indicates that

• Series with high success rate are done by experts => it is difficult to extrapolate to less experienced surgeons

• Laparoscopic myomectomy needs skills
  – Dissection
  – Haemostasis
  – Suture

Technique: Incision?

Incision

• Formerly, incision direction according to
  – Tubal proximity to myoma
  – Orientation of uterine muscular fibers
  – Location of myoma

• Discepolo et al studied vascular orientation surrounding myomas
  – No matter the direction of hysterotomy, superficial myoma vessels can be injured

• Ergonomy +++
• Choose the direction that will be the easiest to suture
Incision

- Circular hysterotomy above the implantation site of the myoma
- Pediculated myomas need no suturing in general

Haemostasis?

- GnRH agonists 2 to 3 months before myomectomy \( \Rightarrow \) decrease blood loss intra-operatively
- Intramyometrial vasopressine decrease blood loss compared to saline
- Oxytocin IV 40 mU/min intraoperatively may reduce blood loss in laparoscopic myomectomy
  - Wang JI, J Minim Invasive Gynecol. 2007 Mar-Apr;14(2):184-8
- Uterine clip during intervention

Hysterotomy closure

- One versus multiples layers: controversial
- In general, multiple layers when endometrial cavity is opened
- \( n=423 \) open myomectomies
  - If cavity is opened peri operative morbidity is higher because of intraoperative bleeding
    - Fever, reintervention and major complications are not different between the 2 groups
  - Blair Donati
  - Inverted Blair Donati
- Reduce dead space +++
  - Blair Donati
  - Inverted Blair Donati
Extraction

- Direct extraction in bag < 3cm
- Electrical morcellator
- Morcellation with chardonnens cold knife
- Posterior culdotomy
Extraction

- Direct extraction in a bag < 3 cm
- Electrical morcellator
- Morcellation with chardonnens cold knife
- Posterior culdotomy

- Never morcellate with monopolar current !!

Adhesions formation

Laparoscopic myomectomy

<table>
<thead>
<tr>
<th></th>
<th>Adhesions (%)</th>
<th>Adnexial adhesions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>133</td>
<td>68 (51.1)</td>
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</table>

<table>
<thead>
<tr>
<th>Epoch</th>
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<tr>
<td>Heistin (1992)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marti (1995)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulliti (1996)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dubuisson (1998)</td>
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</table>

Laparotomic myomectomy

<table>
<thead>
<tr>
<th>Epoch</th>
<th>Adhesions (%)</th>
<th>Adnexial adhesions (%)</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>135</td>
<td>121 (89.6)</td>
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<table>
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<td>Striks (1996)</td>
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<td>Tulandi (1993)</td>
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<td>Multicenter Study Group (1995)</td>
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<tr>
<td>Belliti (1996)</td>
<td></td>
<td></td>
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<tr>
<td>Ugur (1996)</td>
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Adhesions prevention

- Myomectomy = High adhesions incidence
- GnRH agonists : no benefit in adhesions prevention in open myomectomy


- Intra uterine adhesions in case of cavity opening


- Barrier Hydrogel => decreases adhesions formation in laparoscopic or open myomectomy

Mettler Letal. Hum Reprod. 2008 May;23(5):1093-100
Adhesion prevention

- Cochrane review
  - Efficiency for Interceed & Gore-Tex
  - No Efficiency for Seprafilm & Fibrin patches
  - Includes 5 studies for laparoscopic or laparotomic myomectomy


Data review

Several publications with largest serie of 2000 cases and follow up of 6 years
Complications rate = 8 to 11 %
Pregnancy rate = 57 to 69 %


Data review IVI Valencia

<table>
<thead>
<tr>
<th>Laparoscopic Myomectomy</th>
<th>n : 113</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not related with Infertility</td>
<td>36 (32 %)</td>
</tr>
<tr>
<td>Infertile Patients</td>
<td>77 (68 %)</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>42 (54.5 %)</td>
</tr>
<tr>
<td>Spontaneous Pregnancy</td>
<td>13 (31 %)</td>
</tr>
<tr>
<td>Pregnancy after LM &amp; A.R.T.</td>
<td>29 (69 %)</td>
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Data review

<table>
<thead>
<tr>
<th>Laparoscopic Myomectomy</th>
<th>Nº</th>
<th>Size cm.</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>Single Mioma</td>
<td>63</td>
<td>2 - 12</td>
<td>27</td>
</tr>
<tr>
<td>Múltiples Myomas</td>
<td>50</td>
<td>1 - 9</td>
<td>81</td>
</tr>
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</table>

Delay of Gestations post Myomectomy in infertile patients need A.R.T.

- 1º CICLE: 18 (62.1%)
- 2º CICLE: 6 (20.7%)
- 3º CICLE: 4 (13.8%)
- >4º CICLE: 1 (3.4%)

Complications

- Surgical: 5/113 (4.2%)
- Obstetrical: 7/42 (16.6%)

No Uterine rupture

Complications:

- Surgical: 5/113 (4.2%)
- Obstetrical: 7/42 (16.6%)

No Uterine rupture
Conclusions 1

Submucous myoma with alteration of the uterine cavity should be treated both in the infertile as in patients with abnormal uterine bleeding.

Hysteroscopic myomectomy is an effective treatment for patients with symptomatic submucous myoma, particularly when the uterus is not grossly enlarged the amount of fibroid(s) are limited and the localization is mainly inside the uterine cavity.

With the improvement of bipolar instrumentation the indications for hysteroscopic approach are increasing.

Conclusions 2

LAPAROSCOPIC MYOMECTOMY offers comparable results to laparotomic myomectomy.

Laparoscopic approach reduces adhesion formation, blood loss and hospital stay.

Laparoscopic Myomectomy requires a skilled laparoscopic surgeon with optimal instrumental support

Laparoscopic myomectomy seems indicated in the infertile patient for the treatment of intramural myoma’s

Conclusion

• Yes, we can!

• But ...
  – What do we want?
  – What is better for our patients?