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

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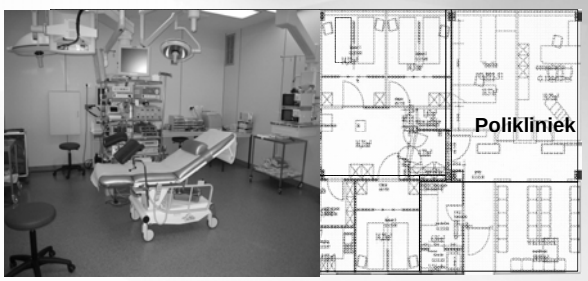
One Stop Uterine diagnosis

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

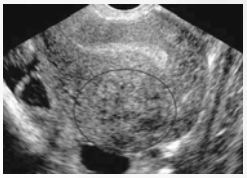
Ambulatory endoscopic unit



One Stop Uterine diagnosis

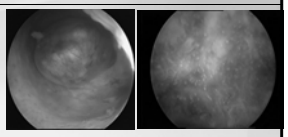
1. Ultrasound

Myometrial changes?



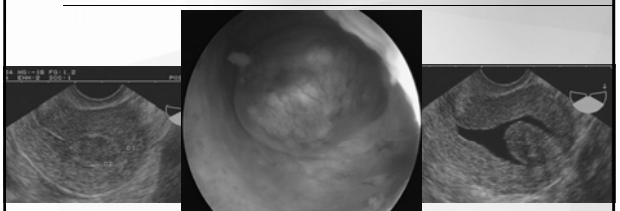
One Stop Uterine diagnosis

2. Hysteroscopy
   Cavity form?
   Endometrium?
   Subtle lesions?



3.Kontrast sonography
   Cavity form?
   Measure Intracavitary laesions.

Proper diagnosis of fibroids



Ultrasound

Hysteroscopy

Contrast sonography

Supplemantary exams necessary ?

When ?

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

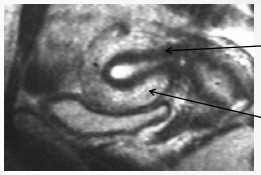
How ?

1. NMR imaging
2. Hysteroscopic exploration

Enlarge the diagnosis when one stop diagnosis is not clear.

1. MRI

MRI devides Myometrium in
2 structural and functional different entities



small central zone of increased density

Junctional zone

Larger outer hypodenser zone

Outer myometrium

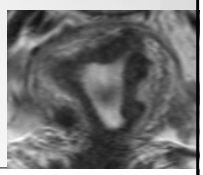
Junctional Zone Myometrium

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

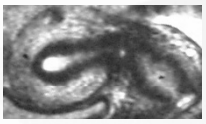
Myometrium

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

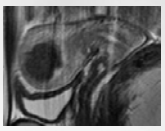
The intramural fibroid should be classified as either JZ or OM fibroid.

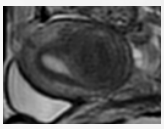
Findings at MRI : Myoma ?

Normal

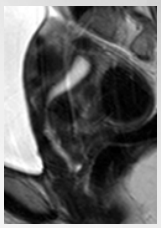


JZ Myoma

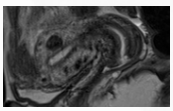




JZ - OM Myoma



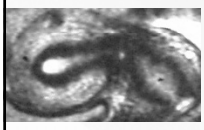
OM Myoma

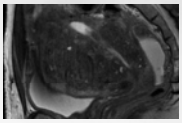


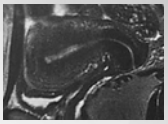
Findings at MRI : Adenomyosis - Adenomyoma ?

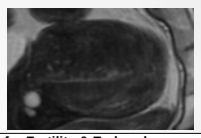
Loss of differentiation JZ - OM

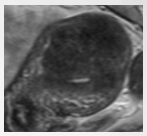
Normal





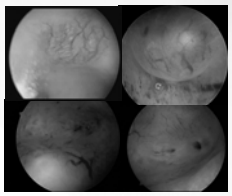


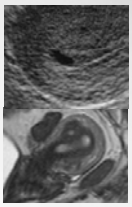




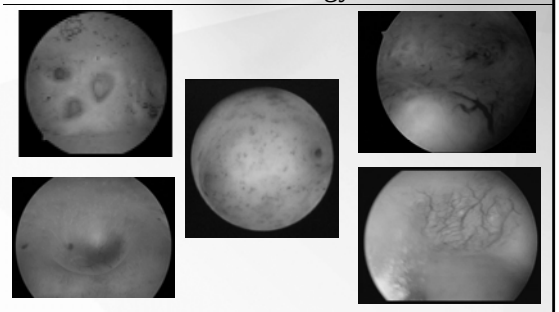
Enlarge the diagnosis?

2. Hysteroscopic exploration of the JZ myometrium in case of focal pathology.





Subtle lesions a sign for Junctional Zone Pathology ?



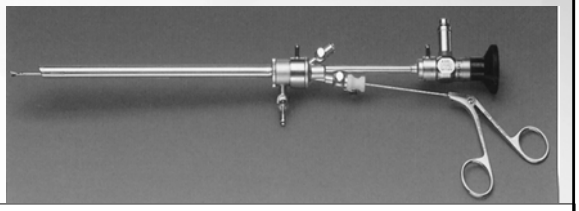
Hysteroscopic Operative Myometrial Exploration

4 important conditions

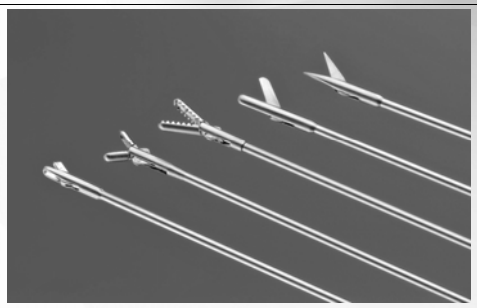
- Ambulatory or office endoscopic unit
- Watery (Saline) distension medium
- Small diameter instrumentation with high optical quality
- Mechanical and Bipolar Surgery with atraumatic technique

Instrumentation

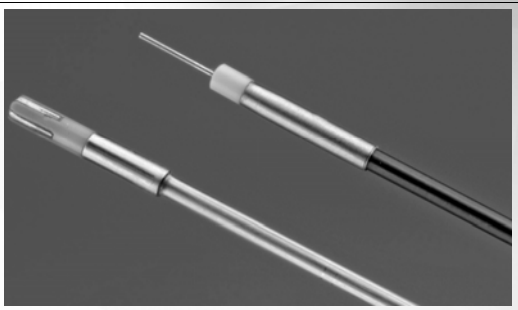
30° rod lens optic:	**2.0 mm**	**2.9 mm**
Operative 5 Fr. single flow sheath:	3.6 mm	4,3 mm
Operative continuous flow sheath :	4,2 mm	5.0 mm



5 French Mechanical probes

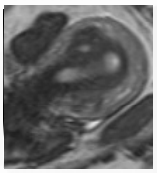


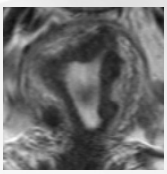
5 French Bipolar probes

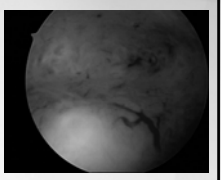


DD

JZ myoma - adenomyoma – cyst



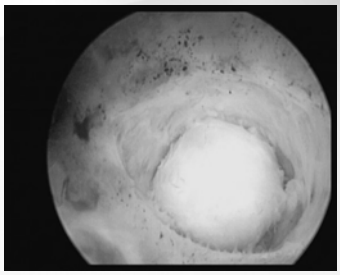




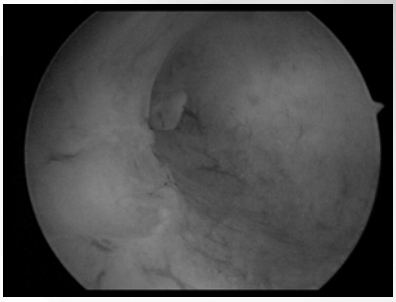
Focal subendometrial myometrial pathology seen at MRI

Subtle lesions

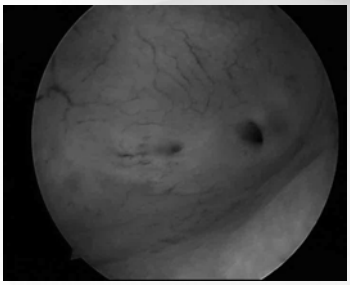
JZ Myoma



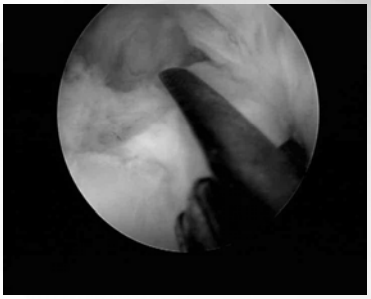
Adenomyoma



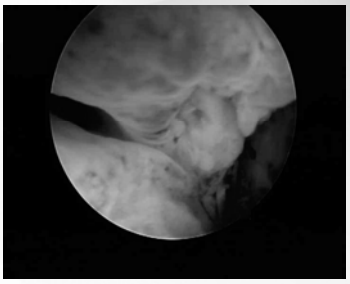
Subtle lesions and adenomyosis ?



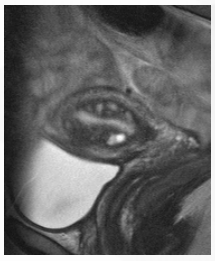
Resection of adnomyotic cyst

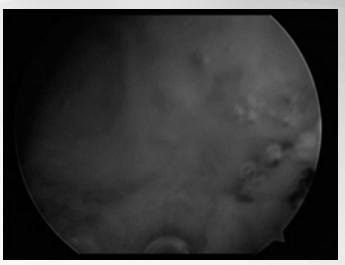


Resection of adnomyotic cyst

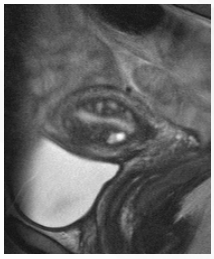


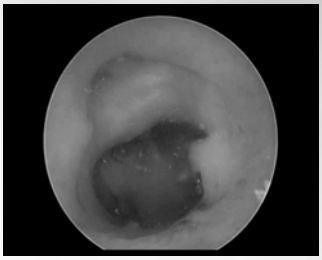
coagulation of adnomyotic cystic wall





Postoperative Result





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PART 2
Treatment
Hysteroscopic myomectomy

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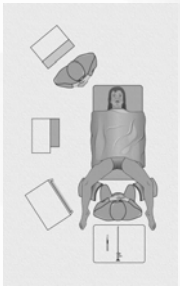
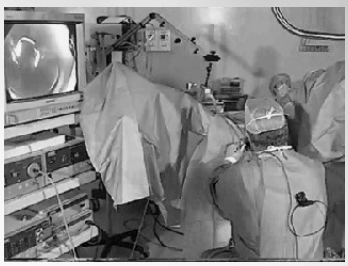
Conventional Hysteroscopic Surgery





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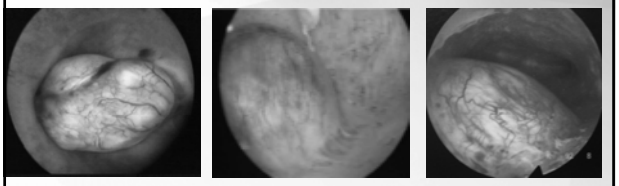
The ESGE* classification of submucous myomas



TYPE 0 TYPE 1 TYPE 2

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Hysteroscopic Myomectomy

Preoperative Examinations

- Ultrasound → Size
- Contrast sonography → Location (% intramural part)
- Hysteroscopy → Number
- M.R.I.? → Endometrial vascularisation

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Hysteroscopic Myomectomy

Operative risks are related to

- Location (% intramural part)
- Numbers of myomas
- Surgical technique
- Distension fluid
- Size
- Endometrial vascularisation

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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

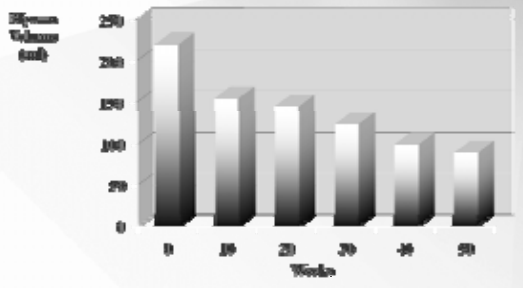
  minimal myometrial safety margin of 5 mm

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

GnRH-a treatment **Surgery**

↓ IIIIII ↓ ↓ **10 – 12 weeks**

Day 25 **4 weeks** **8 weeks**

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

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A. Golan, Hum Reprod. 1996

Combined medical - surgical approach

Indications

- Myoma larger than 2 cm
- Anaemia

Relative Indications

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

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Distention medium

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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

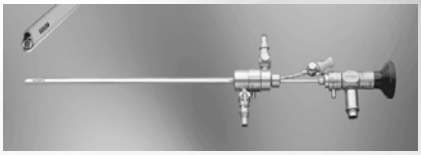
Bipolar surgery using ionic solutions (saline)
Isotonic hyperhydration is less dangerous
In young patients up to 4 L. of losses can be accepted

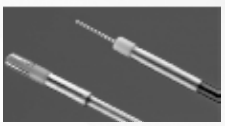
Hysteroscopic Myomectomy

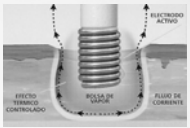
Always use a pressure and flow controlled pump system to work at minimal necessary pressure

Always perform continuous fluid balance independently of the medium used

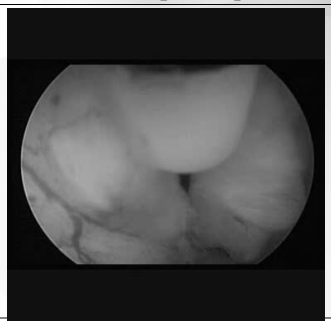
Operative Hysteroscopy instrumentation



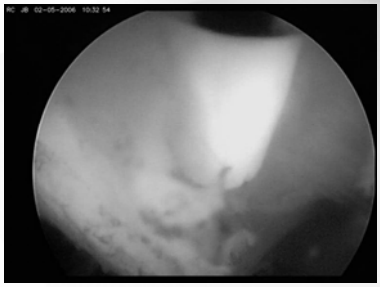




5 French Bipolar probes



VERSAPOINT

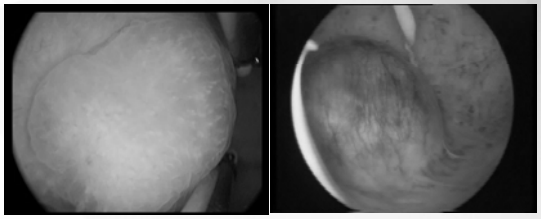


Classical approach for myoma and polyp

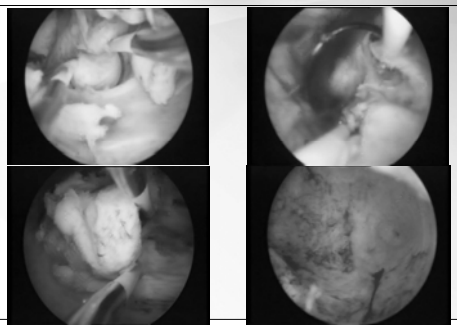
Resectoscope

Unipolar polyp and myomaresection

Non ionic fluid

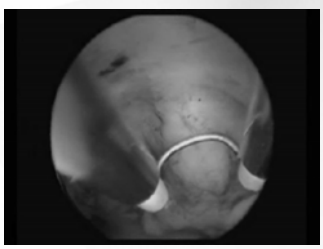


Unipolar myoma Typ 1 resection



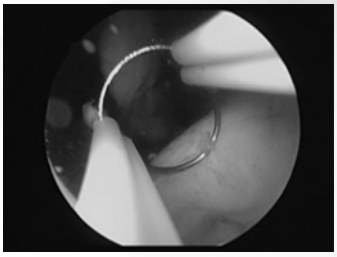
Versapoint approach for myoma

Ionic fluid



Bipolar resectoscope for myoma

Ionic fluid

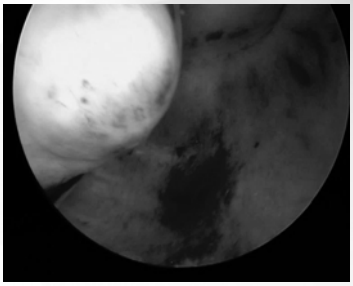


Hysteroscopic Myomectomy

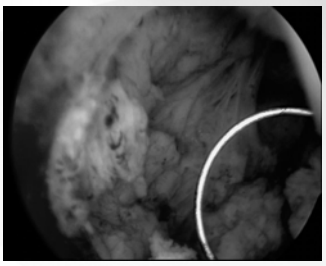
Bipolar resectoscope is recommended but

- Loop different shape and size
- Different surgical manoeuvres
- More bubbles
- Modern generator

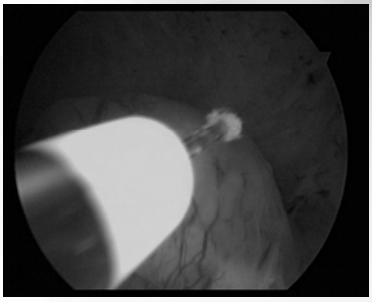
Bipolar hysteroscopic myomectomy



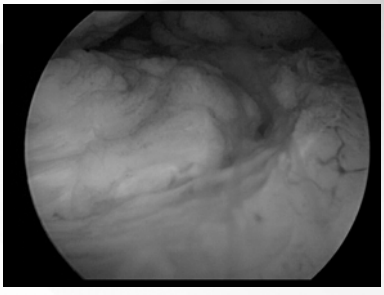
Bipolar hysteroscopic myomectomy



Bipolar hysteroscopic myomectomy



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 165 patients with normal sized uteri and not more than two myomas was 94.3% (+/- 1.8%) at 2 years and 90.3% (+/- 3.0%) 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 ?

Emanuel MH, Wamsteker K Obstet Gynecol. 1999 May;93:743-8.

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

European theAcademy of Gynaecological Surgery

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History

- 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,...

Indications and limits

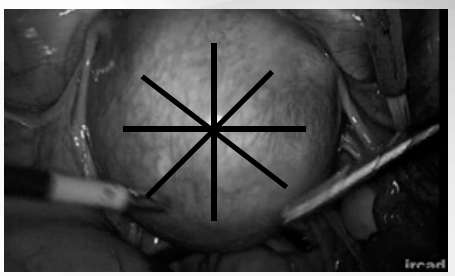
- A recent increase of size is not longer an indication Critchley HO, Fertil Steril 2007; 87 : 466–76.
- Pre operative diagnosis of myoma
  - N = 1332
  - Uterine sarcoma = 2 to 3 / 1000
  - Not more frequent in the group where recent increase in myoma size is reported

Parker WH, Fu YS, Berek JS. Uterine sarcoma in patients operated on for presumed leiomyoma and rapidly growing leiomyoma. *Obstet Gynecol.* 1994; 83(3):414-8.

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 ?

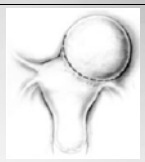


Incision

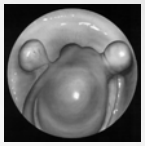
- Formerly, incision direction according to
  - Tubal proximity to myoma
  - orientation of uterine muscular fibers
  - Location of myoma
- Discepola et al studied vascular orientation surounding myomas
  - No matter the direction of hysterotomy, superficial myoma vessels can be injured
- Ergonomy +++
- 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 => decrease blood loss intra operatively
  Fedele L, Br J Obstet Gynaecol 1990;97:393–6.
  Malone LJ. Obstet Gynecol 1969; 34:200–3.
  Smith DC, J Obstet Gynecol 990;162:1476–9; discussion 1479–82.
- Intramyometrial vasopressine decrease blood loss compared to saline
  Frederick J, Br J Obstet Gynaecol 1994;101: 435–7
- Oxytocin IV 40 mUI/min intraoperatively may reduce blood loss in laparoscopic myomectomy
  Wang CJ, J Minim Invasive Gynecol. 2007 Mar-Apr;14(2):184-8
- Uterine clip during intervention

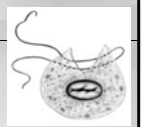
Hysterotomy closure

- 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 Gavai M et al. Clin Exp Obstet Gynecol. 2008;35(2):107-12.
- Reduce dead space +++
  - Blair Donati
  - Inverted Blair Donati

Laparoscopic Myomectomy A. Wattiez

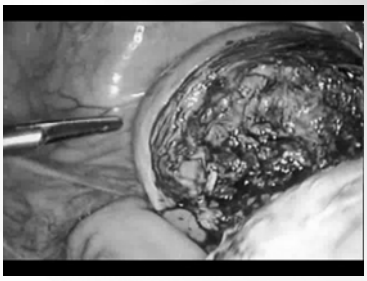
Laparoscopic Myomectomy A. Wattiez

Hysterotomy closure



Hysterotomy closure

Hysterotomy closure two layers

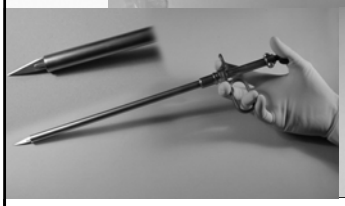


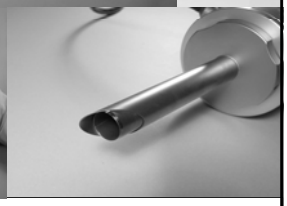
Laparoscopic Myomectomy J. Ferro

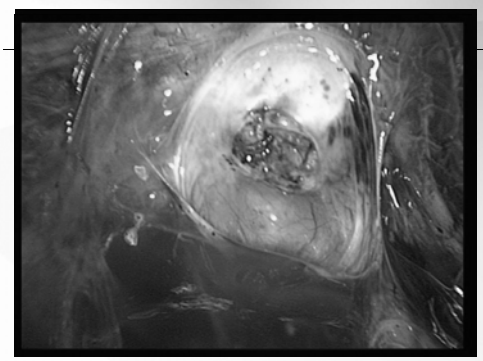
Extraction

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

Extraction







Extraction

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

- Never morcellate with monopolar current !!

Adhaesion formation

Laparoscopic myomectomy

		Adheasions (%)	Adnexial adhaesions(%)
Total	133	68 (51,1)	29 (30,5)

Hasson (1992) Mais (1995) Bulletti (1996) Dubuisson (1998)

Laparotomic myomectomy

Etude	n	Adheasions (%)	Adnexial adhaesions(%)
Total	135	121 (89,6)	51 (68,9)

Starks (1998) Tulandi (1993 Multicenter Study Group (1995) Bulletti (1996) Ugur (1996)

Adhaesion prevention

- Myomectomy = High adhesions incidence
- GnRH agonists : no benefice in adhesions prevention in open myomectomy
  Coddington CC et al.Fertil Steril. 2008 Apr 24.
- Intra uterine adhesions in case of cavity opening
  Fedele L,etal. Br J Obstet Gynaecol 1990;97:393–6.
- Barrier Hydrogel => decreases adhesions formation in laparoscopic or open myomectomy

  Mettler L,etal. Hum Reprod. 2008 May;23(5):1093-100

Adhaesion prevention

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

Ahmad G, Duffy JM, Farquhar C, Vail A, Vandekerckhove P, Watson A, Wiseman D. Barrier agents for adhesion prevention after gynaecological surgery. Cochrane Database Syst Rev. 2008 Apr 16;(2):CD000475

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 %

Sakamoto S, Yoshino H, Shirahata Y, Shimodairo K, Okamoto R. Pharmacotherapeutic effects of kuei-chih-fu-ling-wan (keishi-bukuryo-gan) on human uterine myomas. *Am J Chin Med* 1992;20:313–7.

Nowak RA. Novel therapeutic strategies for leiomyomas: targeting growth factors and their receptors. *Environ Health Perspect* 2000;108(Suppl 5):849–53

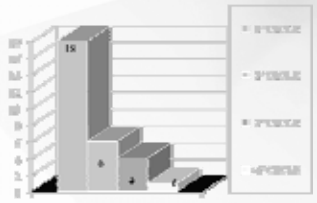
Data review IVI Valencia

Laparoscopic Myomectomy	**n : 113**
Not related with Infertility	**36 (32 %)**
Infertile Patients	**77 (68 %)**
Pregnancy	**42 (54.5 %)**
Spontaneous Pregnancy	**13 (31 %)**
Pregnancy after LM & A.R.T.	**29 (69 %)**

Data review

Laparoscopic Myomectomy	Nº : 113	Size cm.	Type SS	IM
Single Mioma	63 56 %	2 - 12	27	36
Múltiples Myomas	50 44 %	1 - 9	81	48

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



1º CICLE : 18 (62.1 %)

2º CICLE : 6 (20.7 %)

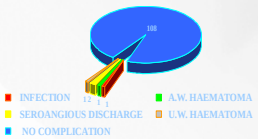
3º CICLE: 4 (13.8 %)

> 4º CICLE : 1 (3.4 %)

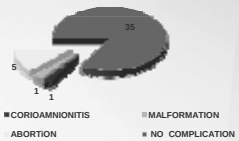
n : 29

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 ?

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