ADENOMYOSIS

Need for correct diagnosis and treatment before ART

S. GORDTS

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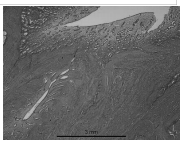
Grado, 6-7 Mai 2011

Conflict of interest: cons. Storz

Adenomyosis - Pathogenesis

Presence of endometrial glands and stroma deep within the myometrium (>2.5 mm from EJZ)

It is a myoproliferative disease of the inner myometrium and is further characterized by an altered local paracrine and immune microenvironment



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Adenomyosis - Characteristics

Comparable with low grade malignancies:

- potential local invasion
- angiogenesis
- cellular proliferation

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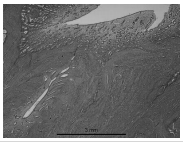
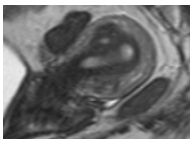
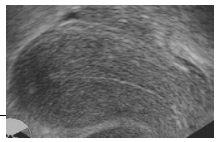
Adenomyosis - Incidence

No real clinical diagnosis
common histological diagnosis



Clinical entitiy
TVS and MRI





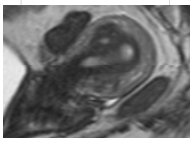
Incidence: 5- 70 %
retrospective studies

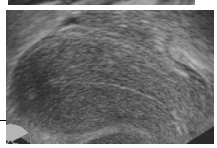
Adenomyosis - Incidence

Clinical entitiy
TVS and MRI

subfertility
dysmenorrhea
menorraghia

Incidence: 28/56 (50%)

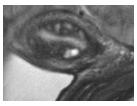




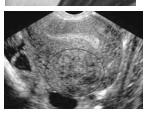
Brosens J et al.1995 Lancet,346

Adenomyosis : Minimal invasive diagnosis ?

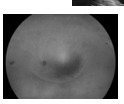
Magnetic Resonant Imaging
MRI

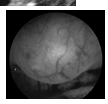


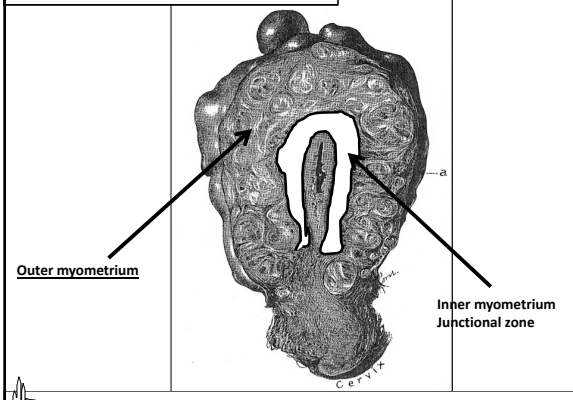
Ultrasound



Hysteroscopy







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Junctional Zone Myometrium

Functional important entity in reproduction

- **Ontogenetically related to endometrium**
- **Cyclic changes in SSH receptors**
- **Role in gamete transport and implantation**

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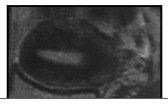
Junctional Zone Myometrium Important role in Reproduction

Functional important entity in reproduction

- **Early changes from time of implantation**
- **Decidualisation and trophoblast invasion**
- **Defective transformation of JZ spiral arteries in spectrum of pregnancy complications**



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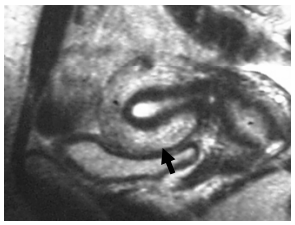
THE OUTER MYOMETRIUM

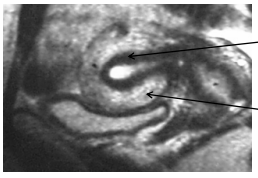
Less important role in reproduction



Muscle contractions during delivery

MRI
clinical significance of the myometrial architecture

Myometrium has 2 structural and functional different entities



Junctional zone
small central zone of increased density
IMPORTANT IN REPRODUCTION

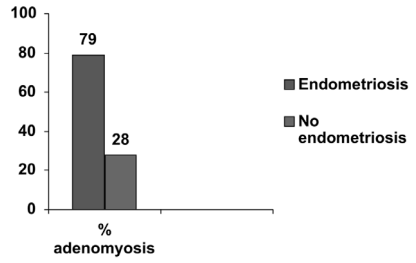
Outer myometrium
Larger outer hypodenser zone

ADENOMYOSIS AND REPRODUCTION

Relation ?

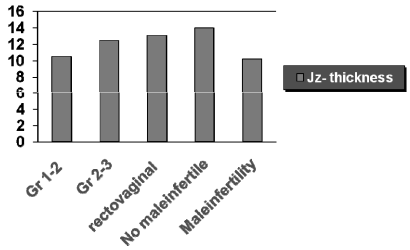
Disturbed JZ activity *(Kunz et al, Brosens J et al)*

Infertility:Adenomyosis and endometriosis (MRI)



Kunz, Human Reprod 2005

Endometriosis: Jz-zone thickness and degree of endometriosis, infertility



Kunz, Human Reprod 2005

ADENOMYOSIS AND REPRODUCTION

Relation ?

Disturbed JZ activity *(Kunz et al, Brosens J et al)*

Experimental data baboons:
- necropsy *(n=37)* with adenomyosis
  - all life long infertility
  - 43% also endometriosis

(Barrier Br et al Fertil Steril 2004)

ADENOMYOSIS AND REPRODUCTION

Relation ?

Adenomyosis negative impact on pregnancy rate after colorectal resection endometriosis.
(Darai et al Fertil Steril 2005)

Occurence of pregnancies after reductive treatment

Adenomyosis and previous surgery

Simultaneous disruption of endometrium and myometrium:

- Caesarian sectio
- myomectomy
- spontaneous abortion (OR 1.7- 4.35)
- D&C (OR 2.2 – 15.5)
- endometrial ablation

(Parazzini et al,1997; Curtis et al; 2002,Levgur et al, 2000)

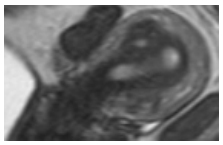
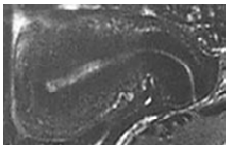
Adenomyosis and previous surgery

	Odds ratio	95% Conf.int.
Gravidity	1.09	1.01-1.17
Uterine leyomyoma >2cm	0.33	0.25-0.44
Any previous surgery	1.39	1.05 – 1.84

Panganamamula Obst.& Gynec.2004, 104

MRI provides clinical entity for adenomyosis

MRI visualises the distortion of the myometrial architecture

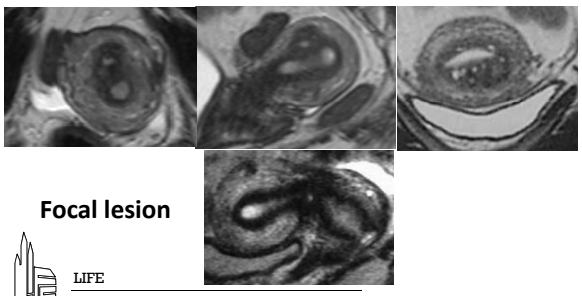
MRI
New challenges to uterine diagnosis

MRI has demonstrated the importance of JZ pathology.

Uterine diagnosis should implement the evaluation of the JZ myometrium.

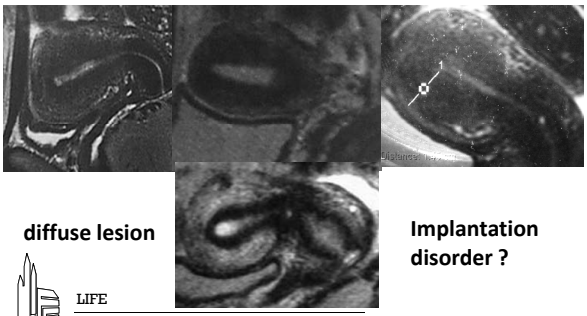
HOW ?
As MRI can not be implemented as a screening procedure we explore the value of US and HSC ?

NMR is an accurate technique to detect uterine adenomyosis



Focal lesion

NMR is an accurate technique to detect uterine adenomyosis



diffuse lesion

Implantation disorder ?

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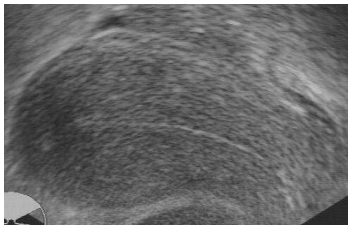
Ultrasound

Normal myometrium is seen as a homogenuous structure in ultrasound



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TVS characteristics for adenomyose

- Distortion and enlargment of myometrial layer
- Zones of Hypo/hyper echogenicy
- Myometrial haemorragic cysts

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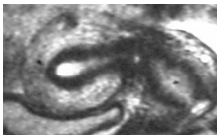
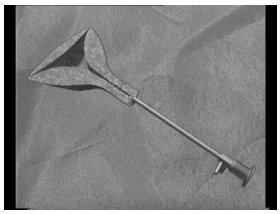
Hysteroscopy
Natural access to JZ myometrium





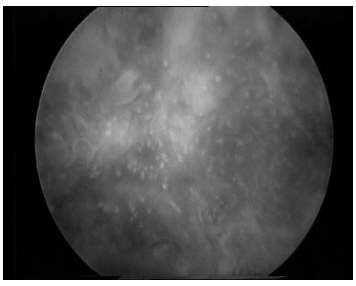
Subtle lesions sign of JZ Pathology?

Abnormal endometrial images with an unclear clinical significance

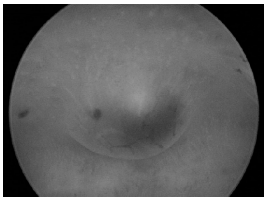
Subtle lesions possibly related to adenomyosis

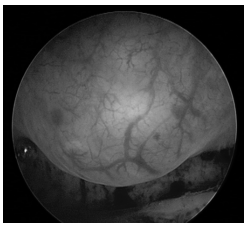
- Strawberry pattern
- Cystic mucosal elevation
- Focal or general hypervascularisation
- Endometrial defects

Strawberry pattern

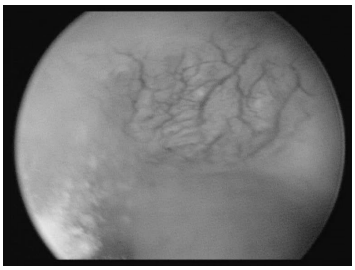


Mucosal elevation





marked localised vascular pattern



Endometrial defects

One stop uterine diagnosis

Ultrasound - Fluid Mini-Hysteroscopy -Kontrast sonography

Neither routine US nor HSC have pathognomonic images for adenomyosis,

Question remains how we can provide correct tissue removal for histological diagnosis ?

Ultrasound and Hysteroscopic combined approach

New Tools for Myometrial Exploration

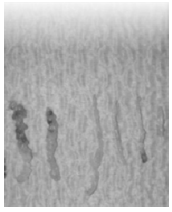
Spirotome acc. to Gordts

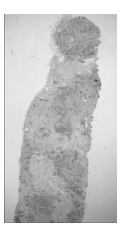
A device made to harvest high quality samples from soft tissues.

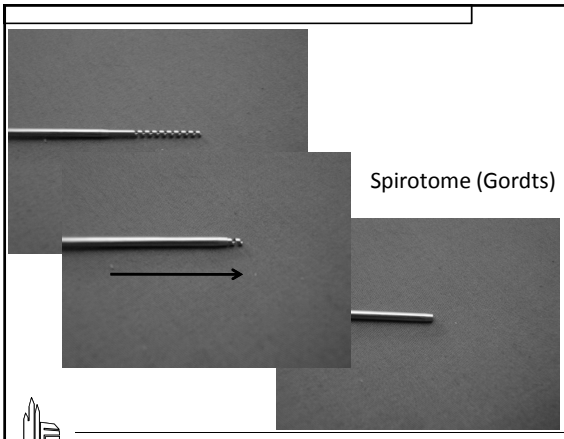
It is built on the pioneering concept of a cutting helix on a cutting cannula well identified by Ultrasound.

Spirotome

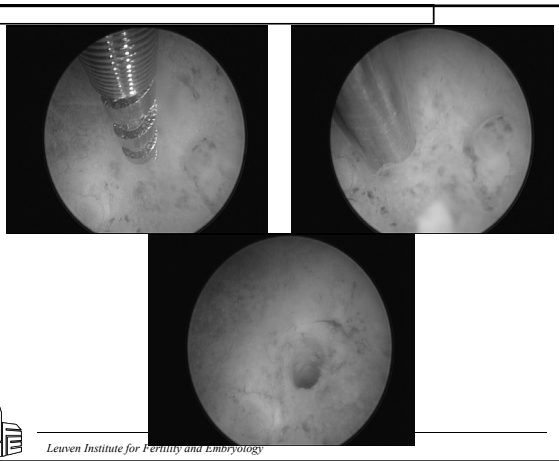
The sample is harvested by turning the helix into the diseased area under ultrasound guidance. The cannula turns subsequently over the helix to free the sample from the surroundings.



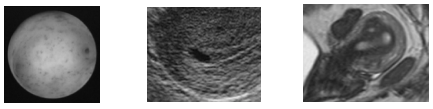




Spirotome (Gordts)



Hysteroscopic guided Ultrasound controled myometrial biopsy with Spirotome.



Procedure

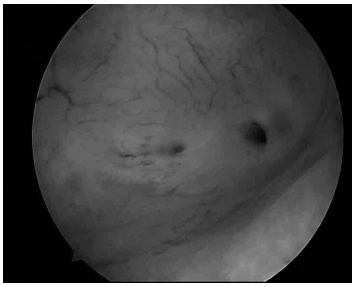
1.TVS shows myometrial distortion
2.Diagnostic HSC shows normal endometrium and cavity
3.Activation of 3,7 mm continuous flow sheath
4.Removal 2,9 hysteroscope
5.Introduction Spirotome

Spirotome - Ultrasound

ADENOMYOSIS AND TREATMENT

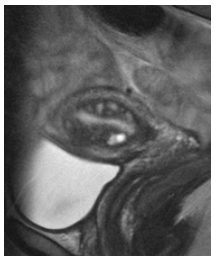
Surgery: **hysterectomy (subtotal)**
endometrial ablation/resection
excision (laparoscopy/-tomy)
hysteroscopic excision
laparoscopic myometrial coagulation
embolisation; MRI focused US
photodynamic therapy

Exploration of subtle lesions.



Resection adenomyoma

Postoperative Result



ADENOMYOSIS AND TREATMENT

Surgery – *clinical aspects*:

- darker color, less firm consistency
- no well defined cleavage plane
- dichotomous disease
  - -disruption JZ
  - -secund.infiltr. myometrium
- more difficult wound apposition

ADENOMYOSIS AND TREATMENT

Reductive surgery: difference with myomectomy

no obvious plane of cleavage

adenomyosis infiltrates normal myometrium

⇩

excision of diseased area substracts
myometrial mass from the total uterine volume

ADENOMYOSIS AND TREATMENT

Reduction in myometrial capacity:

abortion
premature labour
uterine rupture
incidence C-section

Fertility and cytoreductive surgery for adenomyosis

Wang C-J et al. (Fertil Steril 2006)	2	>4;9y	Danazol	C-section
Wang P-H et al.(Fertil Steril, 2000)	3	>5y	GnRha	C-section
Kenny PJ et al. (Fertil Steril,2000)	8		GnRha	7 pregn
Ozaki et al (Int J Fert, 1999)	1	>4y	GnRha	C-section
Huang et al (1998)	1	8y	GnRha	C-section
Lin J et al. (Chin Med J, 2000)	1	5y	GnRha	C-section

Fertility and cytoreductive surgery for adenomyosis

Yap C (Fertil Steril, 1997)	52	23.1%	3 ruptures
Fedele et al. (Hum Reprod ,1993, 8)	18	72,2%	
Nezhat et al. (Obst&gynec, 2001,97)	9	56%	
Liu X et al,(XueBao,1998,20)	26	71%	(focal adeno)
		21,4%	(diffuse adeno)
Wood (Hum Rreprod Upd,1998,4)	16	56%	

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Adenomyosis and concomitant disease

	Endo	Myoma
Fedele et al. Hum Reprod ,1993, 8	21.4%	25.0%
Liu JAAGL, 2004,11	24.6%	
Nezhat Obst Gyn,2001, 97	56%	22%
Takeuchi J Min Inv Gynec. 2006,13	78%	

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ADENOMYOSIS and REPRODUCTION STAGING

Many unanswered questions:

- is adenomyosis a progressive disease?
- clinical correlation between extent and severity?
- is simple JZ hypertrophy really adenomyosis?
- which is prognostic value of staging system?
- choice of therapy influenced by staging?

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ADENOMYOSIS and REPRODUCTION
Proposal STAGING

Stage 0 solitary junctional zone hyperplasia without infiltration myometrium

Stage 1 a: focal thickening of junctional zone < 20 mm

b: focal thickening of junctional zone >20 mm

Stage 2 a: diffuse adenomyosis with less than 1/3 of myometrium involved

b: diffuse adenomyosis with more than 1/3 of myometrium involved

Stage 3 uterine adenomyosis and extra-uterine localization (RV, bladder)

ADENOMYOSIS and REPRODUCTION
CONCLUSIONS

Limited number available date

TVS/MRI made from adenomyosis a clinical entity

Decreased fertility through involvement of junctional zone

Cyto reductive treatment results in amelioration of fertility

ADENOMYOSIS and REPRODUCTION
CONCLUSIONS

Surgery : higher risks for impaired pregnancy outcome

Staging is mandatory to standardize treatment outcome

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