

Uterine cavity assessment prior to IVF

Rudi Campo, MD
Leuven Institute for Fertility and Embryology
LIFE
Leuven - Belgium

European
Academy of
Gynaecological
Surgery

Uterine cavity assessment prior to IVF

Checking the human incubator should diagnose all possible changes which can interfere with implantation and pregnancy outcome.

Exploration should include endometrial and junctional zone myometrial laesions.

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Uterine cavity assessment prior to IVF

One stop uterine diagnosis

Feasibility of ambulatory Hysteroscopy (PRCT)

Findings in the infertile patient (PRCT)

Scientific evidence value of hysteroscopy prior to IVF

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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

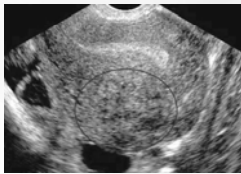
Cavity form?
Measure Intracavitary laesions.

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One Stop Uterine diagnosis

1. Ultrasound

Myometrial changes?

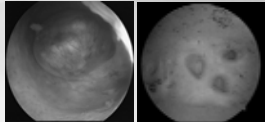


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One Stop Uterine diagnosis

2. Hysteroscopy

Cavity form?
Endometrium?
Subtle lesions?



3. Kontrast sonography

Cavity form?
Measure Intracavitary laesions.

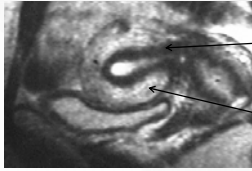


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Enlarge the diagnosis in the infertile patient?

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

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Junctional Zone Myometrium

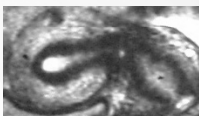
Functional important entity in reproduction

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

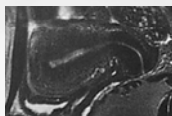
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Possible findings at MRI ?

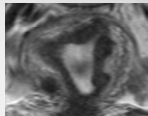
Normal



Diffuse



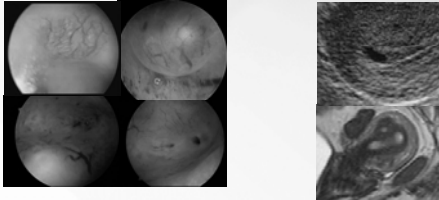
Focal



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Enlarge the diagnosis in the infertile patient ?

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



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Uterine cavity assessment prior to IVF

One stop uterine diagnosis

Feasibility of ambulatory Hysteroscopy (PRCT)

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Scientific evidence value of hysteroscopy prior to IVF

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Feasibility of diagnostic hysteroscopy

Prospective multi-centre randomized clinical trial

GRADE A EVIDENCE

By reducing the diameter of the hysteroscope the effects of patient parity and also surgeon's experience are no longer important !!!

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Campo R, Molinas CR et al. Hum Reprod 2005

Ambulatory Hysteroscopy

4 important conditions

Ambulatory or office endoscopic unit

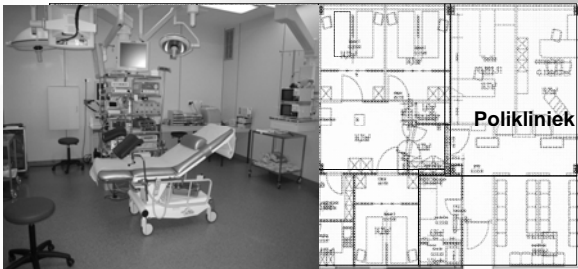
Watery (Saline) distension medium

Small diameter instrumentation with high optical quality

Mechanical and Bipolar Surgery with atraumatic technique

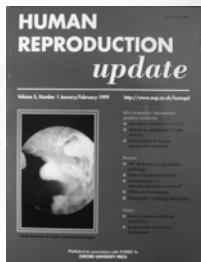
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Ambulatory endoscopic – IVF unit



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Watery distension medium



Grade A evidence
Less painful than CO₂

Hydro-flotation
subtle lesions !!

Saline for bipolar
surgery

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Watery distension medium

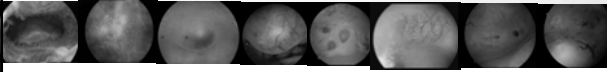
Fluid mini -Hysteroscopy



Effect of magnifying and hydroflotation



Subtle lesions ??



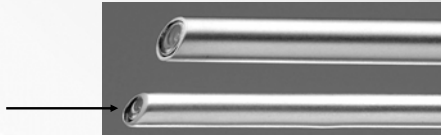
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Small Instrument

Hysteroscope

Diameter

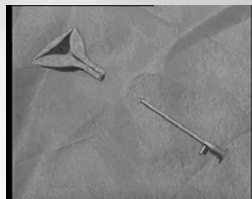
- | | | |
|--------------------------------------|--------|--------|
| • 30° rod lens optic: | 2.0 mm | 2.9 mm |
| • Diagnostic single flow sheath: | 2.8 mm | 3.7 mm |
| • Operative single flow sheath: | 3.6 mm | 4.3 mm |
| • Operative continuous flow sheath : | 4.2 mm | 5.0 mm |



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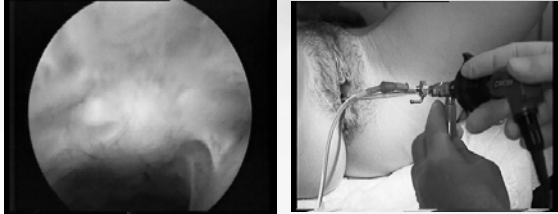
Atraumatic insertion technique

- No speculum
- No tenaculum
- No cervical dilatation
- No anaesthesia, no analgesia
- Atraumatic and sight controlled insertion of the hysteroscope.



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Atraumatic insertion technique



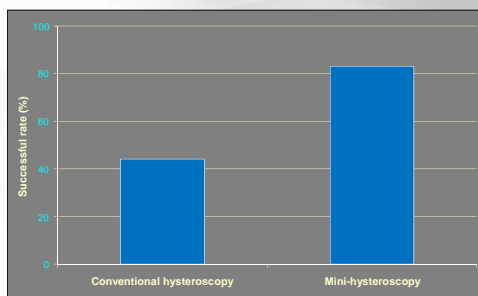
Success rate

Prospective multi-centre randomized clinical trial

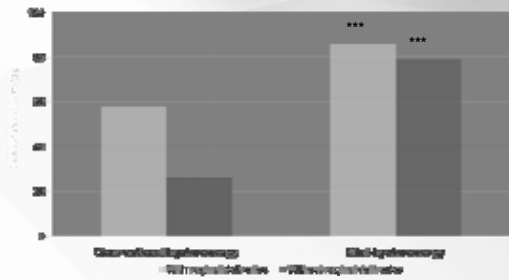
> Calculated:

- > Pain <4 on VAS (0 – 10)
- > Visualization excellent or sufficient
- > No complications

Success rate



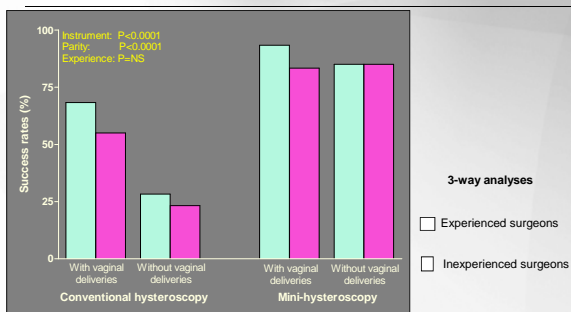
Success rate



5.0 vs. 3.5: ***P<0.0001

Para 0 vs. Para >1: ***P<0.0001

Success rate



Grade A evidence

Hysteroscopy has a high patient compliance and excellent visualisation when a small (< 3,6mm) Instrument is used with watery distension medium and an atraumatic insertion technique.

Conclusion PRCT

> Mini-hysteroscopy:

- Easy to perform
- Excellent patient compliance
- Excellent quality of visualisation
- Real mini-invasive diagnostic procedure

> There is no valuable reason not to check the uterus prior to any fertility treatment.

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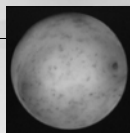
Uterine cavity assessment prior to IVF

- One stop uterine diagnosis
- Feasibility of ambulatory Hysteroscopy (PRCT)
- Findings in the infertile patient (PRCT)
- Scientific evidence value of hysteroscopy prior to IVF

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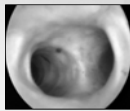
Findings

Normal



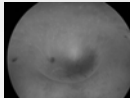
Abnormal

- Congenital malformations 13
- Polyp – Myoma
- Adhesions



Subtle lesions

- Lesions of unknown pathological significance



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Findings

Prospective multi-centre randomized clinical trial

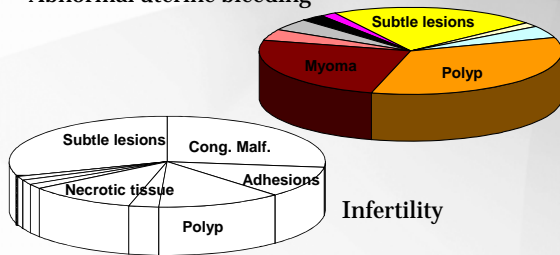
Different pathology in infertile versus AUB patients

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Molinas CR, Campo R et al Best Pract Res Clin Obstet Gynaecol. 2006 Mar 20

Abnormal findings

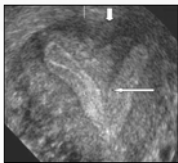
Abnormal uterine bleeding



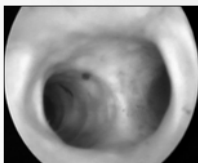
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Diagnostic Procedure congenital malformation

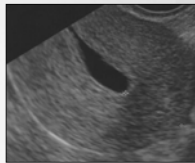
Trans vaginal
Ultrasound



Fluid
Mini Hysteroscopy



Kontrast
Sonography



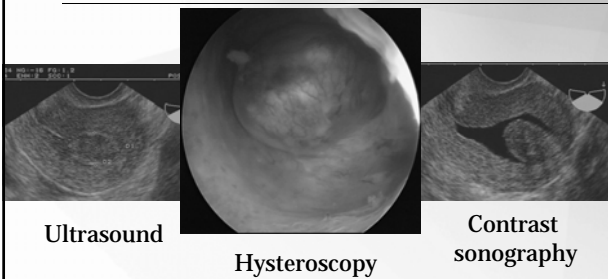
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Incidence of congenital anomalies in 530 consecutive HSC in the LIFE institute

Malformation	N	%
Uterus septus	44	63
T-Shaped	23	33
Uterus unicornis	3	4
	70	100

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Proper diagnosis of fibroids



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Effect of Uterine Fibroids on IVF Outcome

Subserosal

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

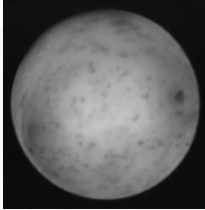
Submucosal

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

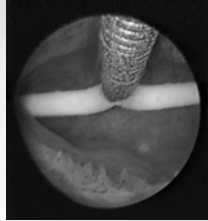
Conclusion: no effect unless the cavity is involved?

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Diagnostic hysteroscopy in the infertile patient: **Subtle Laesions?**



Fertile environment ?



Infertile environment ?

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Subtle lesions

Abnormal endometrial images with an unclear clinical significance

- > Diffuse polyposis
- > Strawberry pattern
- > Hypervascularization
- > Mucosal elevation
- > Endometrial defects
- > Others

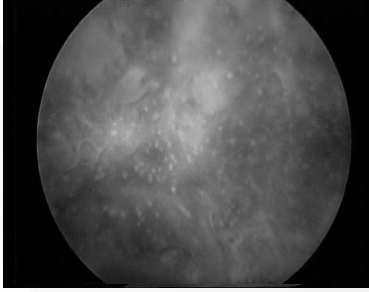
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Diffuse polyposis



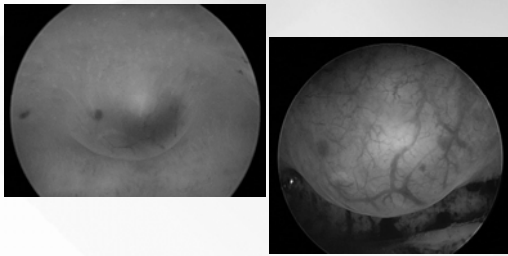
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Strawberry pattern



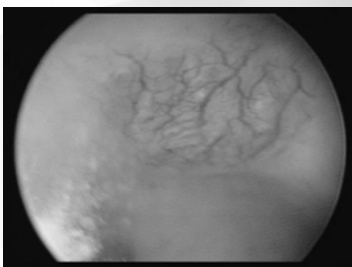
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Mucosal elevation



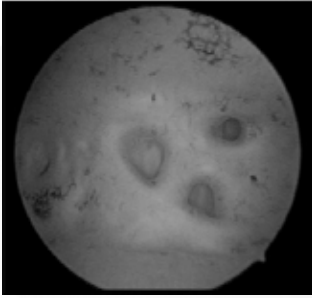
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marked localised vascular pattern



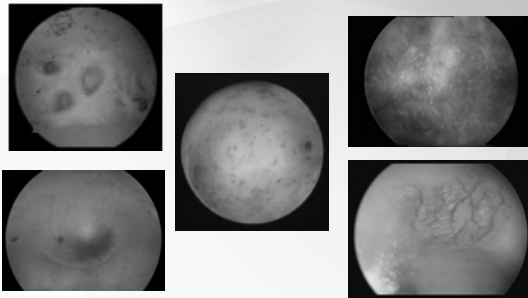
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Endometrial defects



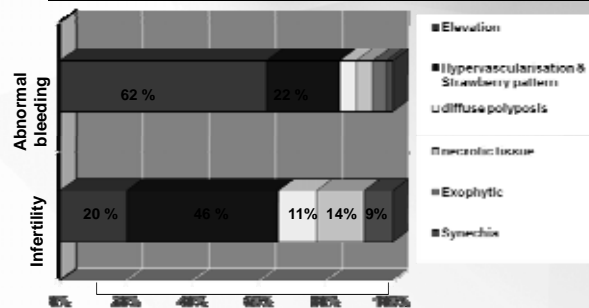
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Subtle lesions a sign for Junctional Zone Pathology ?



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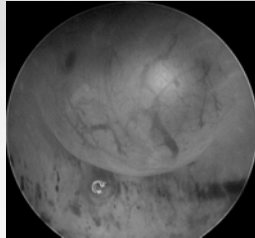
Subtle lesions



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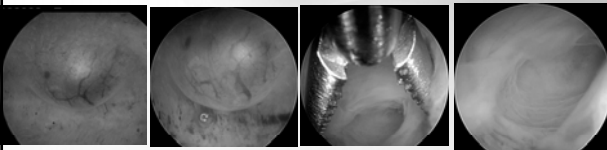
Subtle lesions and infertility?

23-year-old patient of Indo-African origin with a primary infertility of 20 months . A cystic lesion is seen at HSC



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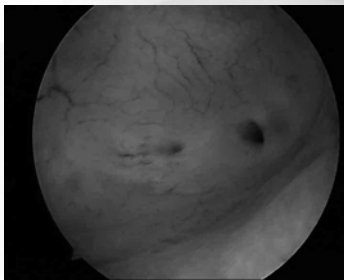
Subtle lesions and infertility ?



Pathology of subtle lesion seen at HSC revealed adenomyosis Spontaneous pregnancy occurred within 3 months after hysteroscopic removal of subtle lesion

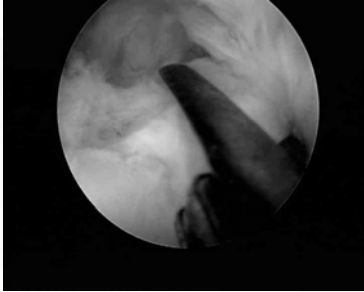
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Subtle lesions and adenomyosis ?



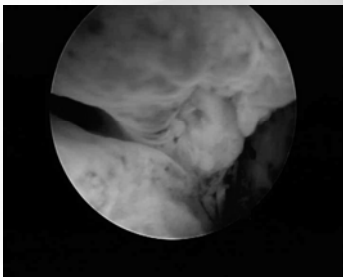
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Resection of adnomyotic cyst



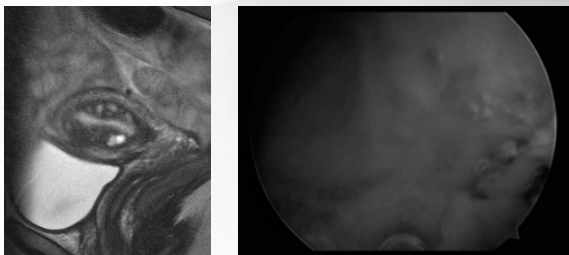
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Resection of adnomyotic cyst



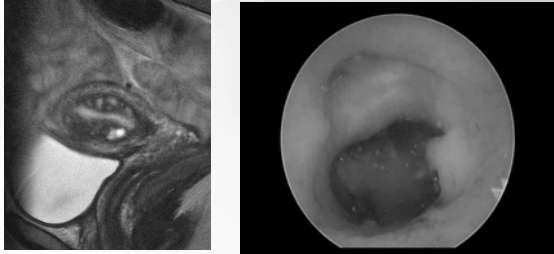
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coagulation of adnomyotic cystic wall



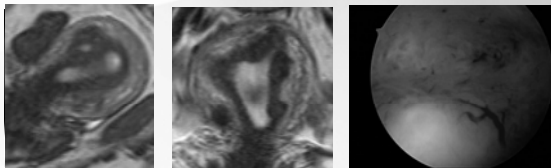
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Postoperative Result



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DD adenomyoma – JZ myoma

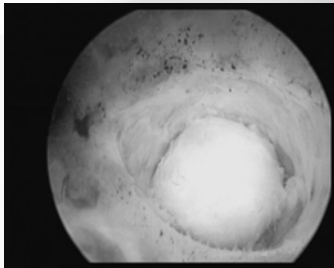


**Focal subendometrial
myometrial pathology seen
at MRI**

Subtle lesions

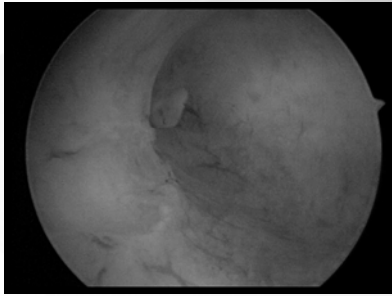
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Resection JZ Myoma



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Resection adenomyoma



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Uterine cavity assessment prior to IVF

One stop uterine diagnosis

Feasibility of ambulatory Hysteroscopy (PRCT)

Findings in the infertile patient (PRCT)

Scientific evidence value of hysteroscopy prior to IVF

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Hysteroscopic findings in patients with repeated IVF failure and normal HSG

Normal	30
Abnormal	25 (45%)
Submucous myoma	2
Polyp	10
Adhesion	6
Endometritis	7

Oliveira et al. Fertil Steril, 80, 2004

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Hysteroscopy prior to IVF cycle improves pregnancy outcome

A systematic review and meta analysis of two randomized (n = 941) and three non-randomized studies (n = 750). (1691 participants)

Evidence of benefit from Office Hysteroscopy in increasing the chance of pregnancy in the subsequent IVF cycle.

Pooled RR = 1.75, 95% CI 1.51–2.03, $P < 0.00001$
 number needed to treat (NNT) to achieve an additional pregnancy was 6 (95% CI 5–8).

Meta analysis of 2 Randomised and 3 Non Randomised studies

Table 3. Patient characteristics and hysteroscopy details in the included studies.

Reference	Type of infertility	Previous investigations	IVF history	Timing of hysteroscopy	Distension medium	Abnormal findings (%)	
Demirol and Gurgan, 2004	Primary	HSG	≥2 failed cycles	In follicular phase	Normal saline	26	R
Raju <i>et al.</i> , 2006	Primary	HSG	≥2 failed cycles	In follicular phase	Glycine	37	
Mooney and Milks, 2003	Not reported	TVS	First or subsequent cycle	In an OCP cycle	Normal saline	56	NR
Doldi <i>et al.</i> , 2005	73% primary	HSG	First or subsequent cycle	In follicular phase	Normal saline	40	
Chung <i>et al.</i> , 2006	Not reported	HSG	≥2 failed cycles	Not reported	Not reported	25	

HSG = hysterosalpingogram, OCP = oral contraceptive pill, TVS = transvaginal sonography.

Hysteroscopy prior to IVF cycle improves pregnancy outcome

Also in case of a normal uterine cavity ?

There remained a significant improvement in the outcome of the normal hysteroscopy subgroup compared with controls.

RR= 1.63, 95% CI 1.35–1.98, $P < 0.001$
 NNT of 7 (95% CI 5–11).

Hysteroscopy prior to IVF cycle improves pregnancy outcome

This positive impact on IVF outcome could be related to the ability of OH to reliably detect and potentially treat intrauterine pathologies encountered during the procedure.

Also a fertility-enhancing effect of OH independent of the correction of intrauterine pathology seems to be evident.

facilitate future embryo transfers ?
Immune repons induced by the OH ?

Conclusions 1

Diagnostic fluid mini - hysteroscopy is an accurate diagnostic tool accessible for any specialist in reproductive medicine (Grade A evidence).

The one stop uterine diagnosis combines the transvaginal ultrasound, fluid mini hysteroscopy and contrastsonography to improve the accuracy of uterine diagnosis.

Conclusions 2

MRI divides the myometrium in two structural and functional different zones.

Subtle laesions seen at diagnostic hysteroscopy can be a sign of junctional zone myometrium pathology.

Conclusions 3

Fluid mini hysteroscopy with concomitant ultrasound offers a new minimal invasive dimension to explore the sub endometrial myometrium in an out patient or ambulatory procedure.

Conclusions 4

Scientific evidence is provided that a fluid hysteroscopy prior to the ivf cycle could improve the pregnancy rates, also when the findings are normal.

There is no valuable reason not to check the uterus prior to any fertility treatment.

Leuven Institute for Fertility & Embryology



Rudi Campo
Stephan Gordts
Patrick Puttemans
Roger Molinas
Sylvie Gordts
Marion Valkenburg
Ivo Brosens