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 lesions.

Feasibility of ambulatory Hysteroscopy (PRCT)

Findings in the infertile patient (PRCT)

Scientific evidence value of hysteroscopy prior to IVF
### One Stop Uterine diagnosis

<table>
<thead>
<tr>
<th><strong>1. Ultrasound</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distortion of homogenous myometrium?</td>
</tr>
<tr>
<td>Endometrial Lining?</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th><strong>Fluid Mini-Hysteroscopy</strong></th>
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<td>Cavity form?, Endometrium?, Cervical canal?</td>
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<td>Subtle lesions?</td>
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### One Stop Uterine diagnosis

<table>
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<td>Endometrium?</td>
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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

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

Possible findings at MRI?

- Normal
- Diffuse
- Focal
2. Hysteroscopic exploration of the JZ myometrium in case of focal pathology.

Enlarge the diagnosis in the infertile patient?

LIFE vzw. Leuven Institute for Fertility & Embryology

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

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!!!
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

Ambulatory endoscopic – IVF unit

Watery distension medium

Grade A evidence
Less painful than CO₂
Hydro-flotation subtle lesions !!
Saline for bipolar surgery
Watery distension medium

Fluid mini-Hysteroscopy

Effect of magnifying and hydroflotation

Subtle lesions ??

Small Instrument

<table>
<thead>
<tr>
<th>Hysteroscope</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 30° rod lens optic:</td>
<td>2.0 mm</td>
</tr>
<tr>
<td>• Diagnostic single flow sheath:</td>
<td>2.8 mm</td>
</tr>
<tr>
<td>• Operative single flow sheath:</td>
<td>3.6 mm</td>
</tr>
<tr>
<td>• Operative continuous flow sheath :</td>
<td>4.2 mm</td>
</tr>
</tbody>
</table>

Atraumatic insertion technique

- No speculum
- No tenaculum
- No cervical dilatation
- No anaesthesia, no analgesia
- Atraumatic and site controled insertion of the hysteroscope.
Atraumatic insertion technique

Success rate

Prospective multi-centre randomized clinical trial

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

Campo R, Molinas CR et al, Hum Reprod 2005
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.

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

Findings

Normal

Abnormal
- Congenital malformations 13
- Polyp – Myoma
- Adhesions

Subtle lesions
- Lesions of unknown pathological significance
Findings

Prospective multi-centre randomized clinical trial

Different pathology in infertile versus AUB patients

Abnormal findings

Abnormal uterine bleeding

Infertility

Diagnostic Procedure congenital malformation

Trans vaginal Ultrasound
Fluid Mini Hysteroscopy Kontrast Sonography
Incidence of congenital anomalies in 530 consecutive HSC in the LIFE institute

<table>
<thead>
<tr>
<th>Malformation</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterus septus</td>
<td>44</td>
<td>63</td>
</tr>
<tr>
<td>T-Shaped</td>
<td>23</td>
<td>33</td>
</tr>
<tr>
<td>Uterus unicornis</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Proper diagnosis of fibroids

- Ultrasound
- Hysteroscopy
- Contrast sonography

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

<table>
<thead>
<tr>
<th>Fertile environment?</th>
<th>Infertile environment?</th>
</tr>
</thead>
</table>

**Subtle lesions**

Abnormal endometrial images with an unclear clinical significance

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

**Diffuse polyposis**
Strawberry pattern

Mucosal elevation

Marked localised vascular pattern
Endometrial defects

Subtle lesions a sign for Junctional Zone Pathology?

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

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

coagulation of adnomyotic cystic wall
**Postoperative Result**

DD adenomyoma – JZ myoma

Focal subendometrial myometrial pathology seen at MRI

Subtle lesions

---

**DD adenomyoma – JZ myoma**

Focal subendometrial myometrial pathology seen at MRI

Subtle lesions

---

**Resection JZ Myoma**
Resection adenomyoma

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Hysteroscopic findings in patients with repeated IVF failure and normal HSG

<table>
<thead>
<tr>
<th>Normal</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal</td>
<td>25 (45%)</td>
</tr>
<tr>
<td>Submucous myoma</td>
<td>2</td>
</tr>
<tr>
<td>Polyp</td>
<td>10</td>
</tr>
<tr>
<td>Adhesion</td>
<td>6</td>
</tr>
<tr>
<td>Endometritis</td>
<td>7</td>
</tr>
</tbody>
</table>

Oliveira et al. Fertil Steril, 86, 2004
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>
<thead>
<tr>
<th>Reference</th>
<th>Type of surgery</th>
<th>Previous investigations</th>
<th>IVF history</th>
<th>Dating of pregnancy</th>
<th>Repeated sections</th>
<th>Absorbed Pathology (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard and Goga, 2004</td>
<td>Primary</td>
<td>Biopsy cycles</td>
<td>In-difficult cases</td>
<td>Normal saline</td>
<td>25</td>
<td>R</td>
</tr>
<tr>
<td>El-Toukhy et al., 2006</td>
<td>Primary</td>
<td>Biopsy cycles</td>
<td>In-difficult cases</td>
<td>Glycine</td>
<td>37</td>
<td>NR</td>
</tr>
<tr>
<td>El-Nagashi et al., 2003</td>
<td>TVS</td>
<td>Partial or  ovarian cycle</td>
<td>In-difficult cases</td>
<td>Normal saline</td>
<td>56</td>
<td>SR</td>
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<td>40</td>
<td>SR</td>
</tr>
<tr>
<td>El-Nagashi et al., 2003</td>
<td>TVS</td>
<td>Biopsy cycles</td>
<td>Not reported</td>
<td>Not reported</td>
<td>28</td>
<td>SR</td>
</tr>
</tbody>
</table>

RR = hysteroscopy/ovarian cycle, 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 lesions 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.