

Clinical approach for the classification of congenital uterine malformations.

[Gynecol Surg.](#) 2012 May;9(2):119-129. Epub 2012 Mar 10.

[Grimbizis GF, Campo R; On behalf of the Scientific Committee of the Congenital Uterine Malformations \(CONUTA\) common ESHRE/ESGE working group: Stephan Gordts, Sara Brucker, Marco Gergolet, Vasilios Tanos, T.-C. Li, Carlo De Angelis, Attilio Di Spiezio Sardo.](#)

Abstract

A more objective, accurate and non-invasive estimation of uterine morphology is nowadays feasible based on the use of modern imaging techniques. The validity of the current classification systems in effective categorization of the female genital malformations has been already challenged. A new clinical approach for the classification of uterine anomalies is proposed. Deviation from normal uterine anatomy is the basic characteristic used in analogy to the American Fertility Society classification. The embryological origin of the anomalies is used as a secondary parameter. Uterine anomalies are classified into the following classes: 0, normal uterus; I, dysmorphic uterus; II, septate uterus (absorption defect); III, dysfused uterus (fusion defect); IV, unilateral formed uterus (formation defect); V, aplastic or dysplastic uterus (formation defect); VI, for still unclassified cases. A subdivision of these main classes to further anatomical varieties with clinical significance is also presented. The new proposal has been designed taking into account the experience gained from the use of the currently available classification systems and intending to be as simple as possible, clear enough and accurate as well as open for further development. This proposal could be used as a starting point for a working group of experts in the field.

No clinical relevance of the height of fundal indentation in subseptate or arcuate uterus: a prospective study.

[Reprod Biomed Online.](#) 2012 May;24(5):576-82. doi: 10.1016/j.rbmo.2012.01.025. Epub 2012 Feb 3.

[Gergolet M, Campo R, Verdenik I, Kenda Suster N, Gordts S, Gianaroli L.](#)

Source

S.I.F.E.S. d.o.o., Reproductive Surgery, Sedejeva 6, 5000 Nova Gorica, Slovenia.

marco.gergolet@gmail.com

Abstract

The American Fertility Society has classified the arcuate uterus as a minor malformation with a benign clinical behaviour. The aim of this prospective study was to verify whether there is any scientific basis for this differentiation. Patients with at least one early miscarriage and a subseptate or arcuate uterus were admitted for hysteroscopic metroplasty. Patients were allocated to a subseptate uterus group, with an indentation of 1.5 cm or more, or an arcuate uterus group, with a smaller indentation. The miscarriage rates after metroplasty were similar between the two groups (14.0% in the subseptate uterus group versus 11.1% in the arcuate uterus group). Before metroplasty, the miscarriage rates were significantly higher in subseptate uterus group, as well as in the arcuate uterus group (both $P < 0.001$). According to these results, there is no evidence to support that the arcuate uterus has a different effect on the reproductive outcome in comparison to the subseptate uterus, neither before nor after surgical correction of the anomaly. Since there is no scientific basis for a separate

classification of the arcuate uterus, a review of the classifications of uterine congenital anomalies should be considered as necessary. Congenital uterine malformations have been classified by the American Fertility Society (AFS) since 1988. Although the AFS classification received wide acceptance and is still the most broadly used system, it is associated with various limitations in effective categorization of the anomalies. It is interesting that, until now, none of the other available options have been able to effectively replace the AFS system. Numerous papers indicate septate or subseptate (partial septate) uterus (AFS class V) is a possible cause of an unfavourable pregnancy outcome. Arcuate uterus (AFS class VI), a slight malformation similar to septate uterus, should differ from septate or subseptate uterus, because this 'minor' malformation should behave benignly with respect to the septate uterus. The aim of this study was to scientifically validate the difference between the arcuate and subseptate uterus in their effect on reproductive outcome through the results of a metroplasty in both groups of patients. A group of 96 patients, who underwent metroplasty after at least one early miscarriage, was divided into two groups according to the severity of the congenital uterine malformation. Our results indicate that there are no differences in pregnancy outcome after metroplasty either in patients with septate or arcuate utera. The poor pregnancy outcome in women with septate uterus seems not to be correlated to the dimension of the septum itself. There are no scientific bases for a separate classification of the arcuate uterus and it is proposed that a review of the classification of uterine congenital anomalies is necessary.

Copyright © 2012 Reproductive Healthcare Ltd. Published by Elsevier Ltd. All rights reserved.

Treatment of congenital malformations.

[Semin Reprod Med.](#) 2011 Mar;29(2):101-12. doi: 10.1055/s-0031-1272472. Epub 2011 Mar 24.

[Brucker SY](#), [Rall K](#), [Campo R](#), [Oppelt P](#), [Isaacson K](#).

Source

Department of Obstetrics and Gynecology, Tübingen University Hospital, Tübingen, Germany. sara.brucker@med.uni-tuebingen.de

Abstract

The prevalence of müllerian malformations is 1 in 200, or 0.5%. A third of the anomalies are septate, a third bicornuate uteri, 10% arcuate uterus, 10% didelphis and unicornuate uterus, and < 5% uterine and vaginal aplasia. Correct diagnosis of the malformation is most important but often very difficult. Correct treatment can only be performed if the malformation is clear. Longitudinal vaginal septums have to be removed due to potential obstetric problems. Transverse vaginal septums can cause hematocolpos and pain and have to be incised crosswise and excised so as not to shorten the vagina at the same time. Congenital vaginal agenesis occurs in Mayer-Rokitansky-Kuster-Hauser syndrome patients and in androgen insensitivity syndrome. The first choice for surgical treatment should be the new laparoscopic-assisted creation of a neovagina. Septate uterus has to be distinguished from a bicornuate uterus. Even if it is not proven to be a cause for infertility, the chance of miscarriage can be diminished by performing hysteroscopic metroplasty. Repair of a uterine

septum in infertility patients often improves pregnancy rates. In contrast, surgical repair of a bicornuate uterus requires an abdominal metroplasty. This should only be performed if the patient has recurrent fetal loss due to the uterine structural defect. In a unicornuate uterus it is most important to determine if there is a second uterine horn that can cause cyclic pain if it has functioning endometrium. The only surgical option in these cases is to remove the rudimentary uterus with endometrium and hematometra, respectively.

Congenital malformations of the female genital tract: the need for a new classification system.

[Fertil Steril](#). 2010 Jul;94(2):401-7. doi: 10.1016/j.fertnstert.2010.02.030. Epub 2010 Mar 31.

[Grimbizis GF](#), [Campo R](#).

Abstract

Current proposals for classifying female genital anomalies seem to be associated with limitations in effective categorization, creating the need for a new classification system that is as simple as possible, clear and accurate in its definitions, comprehensive, and correlated with patients' clinical presentation, prognosis, and treatment on an evidence-based foundation. Although creating a new classification system is not an easy task, it is feasible when taking into account the experience gained from applying the existing classification systems, mainly that of the American Fertility Society.

Copyright 2010 American Society for Reproductive Medicine. Published by Elsevier Inc. All rights reserved.

A multi-centre randomised controlled study of pre-IVF outpatient hysteroscopy in women with recurrent IVF implantation failure: Trial of Outpatient Hysteroscopy - [TROPHY] in IVF.

[Reprod Health](#). 2009 Dec 3;6:20. doi: 10.1186/1742-4755-6-20.

[El-Toukhy T](#), [Campo R](#), [Sunkara SK](#), [Khalaf Y](#), [Coomarasamy A](#).

Source

Assisted Conception Unit, Guy's and St Thomas' Foundation Trust, London, SE1 9RT, UK.
tarek.el-toukhy@gstt.nhs.uk.

Abstract

Background

The success rate of IVF treatment is low. A recent systematic review and meta-analysis found that the outcome of IVF treatment could be improved in patients who have experienced recurrent implantation failure if an outpatient hysteroscopy (OH) is performed before starting the new treatment cycle. However, the trials were of variable quality, leading to a call for a large and high-quality randomised trial. This protocol describes a multi-centre randomised controlled trial to test the hypothesis that performing an OH prior to starting an IVF cycle improves the live birth rate of the subsequent IVF cycle in women who have experienced two to four failed IVF cycles.

Methods and design

Eligible and consenting women will be randomised to either OH or no OH using an internet based trial management programme that ensures allocation concealment and employs minimisation for important stratification variables including age, body mass index, basal follicle stimulating hormone level and number of previous failed IVF cycles. The primary outcome is live birth rate per IVF cycle started. Other outcomes include implantation, clinical pregnancy and miscarriage rates. The sample size for this study has been estimated as 758 participants with 379 participants in each arm. Interim analysis will be conducted by an independent Data Monitoring Committee (DMC), and final analysis will be by intention to treat. A favourable ethical opinion has been obtained (REC reference: 09/H0804/32).

Trial registration

The trial has been assigned the following ISRCTN number: ISRCTN35859078.

Clinical factors determining pregnancy outcome after microsurgical tubal reanastomosis.

[Fertil Steril](#). 2009 Oct;92(4):1198-202. doi: 10.1016/j.fertnstert.2008.08.028. Epub 2008 Oct 18.

[Gordts S](#), [Campo R](#), [Puttemans P](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Leuven, Belgium.

Abstract

Objective

To evaluate pregnancy rates after tubal microsurgical anastomosis.

Design

Retrospective study.

Setting

Private tertiary care center.

Patient(s)

Two hundred sixty-one women undergoing tubal microsurgical anastomosis.

Intervention(s)

Tubal anastomoses were performed by minilaparotomy using microsurgical principles and approximating proximal and distal tubal ends in a two-layer technique with 8-0 ethylon.

Main outcome measure(s)

Pregnancy outcome was analyzed for the technique of sterilization, location of anastomosis, tubal length, age, and semen parameters.

Result(s)

After exclusion of 89 patients lost to follow-up (34%) and 8 who did not attempt to conceive, 164 of the 261 patients were analyzed. The overall intrauterine pregnancy rate was 72.5%, with a miscarriage rate of 18% and a tubal pregnancy rate of 7.7%. Related to age, the cumulative intrauterine pregnancy rate was, respectively, 81%, 67%, 50%, and 12.5% for patients <36, 36-40, 40-43, and >43 years. Mean time to pregnancy was respectively 6.9, 6.2,

and 12.7 months, respectively, for patients aged <36, 36-39, and 40-43 years. According to the type of sterilization, intrauterine pregnancies occurred in 72% after ring sterilization, 78% after clip sterilization, 68% after coagulation, and 67% after Pomeroy sterilization.

Intrauterine pregnancies and ectopic pregnancies, respectively, occurred in 80% and 3.4% in the isthmo-isthmic, 63% and 18% in the isthmo-ampullar, 75% and 8.3% in the isthmo-cornual, 100% and 0% in the ampullo-ampullar, and 60% and 0% in the ampullo-cornual anastomosis groups. Tubal length after anastomosis did not influence the pregnancy rate. In case of fertile sperm, the pregnancy rate was found to be 80%, and it decreased to 50% in case of subfertile semen.

Conclusion(s)

Our results clearly demonstrate the validity of tubal microsurgical anastomosis, establishing a quasinnormalization of the fertility potential and offering the opportunity for a spontaneous conception.

Transvaginal hydrolaparoscopy in the treatment of polycystic ovary syndrome.

[Fertil Steril](#). 2009 Jun;91(6):2520-6. doi: 10.1016/j.fertnstert.2008.04.020. Epub 2008 Aug 16.

[Gordts S](#), [Gordts S](#), [Puttemans P](#), [Valkenburg M](#), [Campo R](#), [Brosens I](#).

Source

Leuven Institute for Fertility and Embryology, Leuven, Belgium. lifelieven@lifelieven.be

Abstract

Objective

To evaluate the efficacy of transvaginal endoscopic ovarian capsule drilling.

Design

Retrospective efficacy study.

Setting

Private tertiary care center.

Patient(s)

Thirty-nine PCOS patients with previously failed ovulation induction; mean duration of infertility 26.5 months (SD +/-2.6); mean age 30.38 years (SD +/-3.8); mean body mass index of 29.4 (SD +/-9.7).

Intervention(s)

Through transvaginal hydrolaparoscopy in a 1-day clinic setting, drilling of the ovarian capsule is performed with a 5-Fr bipolar needle (Karl Storz, Tuttlingen, Germany) creating 10-15 holes of +/-0.20 mm in each ovary.

Main outcome measure(s)

Evaluation of feasibility, spontaneous resumption of ovulatory cycles and pregnancy rates.

Result(s)

Ovarian capsule drilling was performed in 39 patients. Six patients were lost of follow-up. In total, 25 out of 33 patients (76%) became pregnant with a mean duration between procedure and onset of pregnancy of 7.2 months (SD +/-5.4). Natural conception with or without

controlled ovarian hyperstimulation and/or intrauterine insemination occurred in 13 of the 16 patients (81%). Of the 17 patients referred to our IVF program, 12 became pregnant. There were no multiple pregnancies or complications.

Conclusion(s)

The transvaginal approach for ovarian capsule drilling offers a valuable alternative to the standard laparoscopic procedure.

Affordable IVF for developing countries.

[Reprod Biomed Online](#). 2007 Sep;15(3):257-65.

[Ombelet W](#), [Campo R](#).

Source

Genk Institute for Fertility Technology, Department of Obstetrics and Gynaecology, Genk, Belgium. willem.ombelet@telenet.be

Abstract

Worldwide, more than 80 million couples suffer from infertility; the majority are residents of developing countries. Residents of developing countries encounter a lack of facilities at all levels of health care, but especially infertility diagnosis and treatment. Infertility defined as a disease has a much stronger negative consequence in developing countries compared with Western societies. Social isolation, economic deprivation and violence are commonly observed. Tubal infertility due to sexually transmitted diseases, unsafe abortion and post-partum pelvic infections are the main causes of infertility in developing countries. Very often those conditions are only treatable by assisted reproductive technologies. Although preventative measures are undoubtedly the most cost-effective approach, not offering assisted reproduction is not an alternative. This study proposes a specially designed infertility care programme leading to cost-effective simplified assisted reproduction as a valid treatment protocol in developing countries when prevention or alternative methods have failed. Special attention should be given to avoid adverse outcomes such as ovarian hyperstimulation and multiple embryo pregnancy.

Endometriomas--more careful examination in vivo and communication with the pathologist.

[Fertil Steril](#). 2007 Aug;88(2):534; author reply 534-5. Epub 2007 Jun 28.

[Brosens IA](#), [Puttemans P](#), [Campo R](#), [Gordts S](#), [Gordts S](#).

Comment on

[Histologic analysis of endometriomas: what the surgeon needs to know](#). [Fertil Steril. 2007]

Office hysteroscopy and adenomyosis.

[Best Pract Res Clin Obstet Gynaecol](#). 2006 Aug;20(4):557-67. Epub 2006 Mar 22.

[Molinas CR](#), [Campo R](#).

Source

Centre for Gynaecological Endoscopy (Cendogyn), Centro Médico La Costa, Asunción, Paraguay. roger.molinas@lifeleuven.be

Abstract

Adenomyosis, the heterotopic presence of endometrial glands and stroma within the myometrium, has traditionally been diagnosed by the pathologist in hysterectomy specimens. However, the recent development of high-quality non-invasive techniques such as transvaginal sonography (TVS), magnetic resonance imaging (MRI) and hysteroscopy has renewed interest in diagnosing adenomyosis in the office prior to any treatment. Hysteroscopy offers the advantage of direct visualization of the uterine cavity, and since nowadays it is performed in the office, it can be offered as a first-line diagnostic tool for evaluation of uterine abnormalities in patients with abnormal uterine bleeding and/or infertility. The available data clearly indicate that high-quality mini-hysteroscopes, saline as a distension medium, and atraumatic insertion technique are essential for the success of office hysteroscopy. The procedure is indicated in any situation in which an intrauterine anomaly is suspected; it is immediately preceded by a physical exam and a TVS to evaluate uterine characteristics, and it is followed by a second TVS to take advantage of the intracavitary fluid for a contrast image of the uterus. Although diagnostic hysteroscopy does not provide pathognomonic signs for adenomyosis, some evidence suggests that irregular endometrium with endometrial defects, altered vascularization, and cystic haemorrhagic lesion are possibly associated with the entity. In addition to the direct visualization of the uterine cavity, the hysteroscopic approach offers the possibility of obtaining endometrial/myometrial biopsies under visual control. Since they can be performed in the office, the combination of TVS, fluid hysteroscopy and contrast sonography is therefore a powerful screening tool for detecting endometrial and myometrial abnormalities in association with adenomyosis.

Adhesion formation and interanimal variability in a laparoscopic mouse model varies with strains.

[Fertil Steril](#). 2005 Jun;83(6):1871-4.

[Molinas CR](#), [Binda MM](#), [Campo R](#), [Koninckx PR](#).

Source

Laboratory of Experimental Gynecology, Department of Obstetrics and Gynecology, University Hospital Gasthuisberg, Katholieke Universiteit Leuven, Belgium.

Roger.Molinas@uz.kuleuven.ac.be

Abstract

Adhesion formation after laparoscopic surgery was evaluated in mice of different strains. More adhesions were observed in Swiss, NMRI, and BALB/c mice, with less interanimal variability in BALB/c mice. These data point to genetics effects on adhesion formation, which open new insights in its pathogenesis and indicate the importance of a careful strain selection for animal studies.

Hysteroscopic images of an isolated lesion of unknown origin in a young infertile patient.

[J Minim Invasive Gynecol](#). 2005 Mar-Apr;12(2):104-5.

[Puttemans P](#), [Molinas R](#), [Gordts S](#), [Peperstraete L](#), [Campo R](#), [Brosens I](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Heilig Hart Hospital Leuven, Belgium.

Effect of inner myometrium fibroid on reproductive outcome after IVF.

[Reprod Biomed Online](#). 2005 Apr;10(4):473-7.

[Gianaroli L](#), [Gordts S](#), [D'Angelo A](#), [Magli MC](#), [Brosens I](#), [Cetera C](#), [Campo R](#), [Ferraretti AP](#).

Source

SISMeR Reproductive Medicine Unit, Via Mazzini, 12 40138 Bologna, Italy.

Abstract

To evaluate the influence of inner myometrium fibroids (myomas) on the outcome of IVF cycles, a retrospective age-matched controlled study was performed at SISMeR Reproductive Medicine Unit. The study group included 129 IVF/intracytoplasmic sperm injection cycles in 75 patients with one or more intramural and/or submucosal fibroids, while the control group consisted of 129 cycles in 127 patients without fibroids. The two groups were similar for mean oestradiol concentration at human chorionic gonadotrophin administration (1205.16 +/- 874 versus 1395 +/- 821 pg/ml), mean number of transferred embryos (2.02 +/- 0.4 versus 2.14 +/- 0.6) and clinical pregnancy rate (34.9 versus 41.1%). Conversely, the implantation rate was significantly lower in the study group (18.0%) than in the control group (26.5%; $\chi^2 = 4.81$, $P < 0.05$), whereas the rate of spontaneous abortion demonstrated an opposite trend (40 versus 18.9%; $\chi^2 = 4.34$, $P < 0.05$). Further research should be aimed at classifying fibroids on the basis of their location, especially when they are positioned in the junctional zone of the myometrium. Whether this classification will be superior in predicting the impact of fibroids on the reproductive outcome should be elaborated in a large multicentric study.

Prospective multicentre randomized controlled trial to evaluate factors influencing the success rate of office diagnostic hysteroscopy.

[Hum Reprod](#). 2005 Jan;20(1):258-63. Epub 2004 Nov 18.

[Campo R](#), [Molinas CR](#), [Rombauts L](#), [Mestdagh G](#), [Lauwers M](#), [Braekmans P](#), [Brosens I](#), [Van Belle Y](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology (LIFE), Leuven, Belgium.

Abstract

Background

Diagnostic hysteroscopy is not widely performed in the office setting, one of the reasons being the discomfort produced by the procedure. This randomized controlled trial was performed to evaluate the effects of instrument diameter, patient parity and surgeon experience on the pain suffered and success rate of the procedure.

Methods

Patients were randomly assigned to undergo office diagnostic hysteroscopy either with 5.0 mm conventional instruments (n=240) or with 3.5 mm mini-instruments (n=240). Procedures were stratified according to patient parity and surgeon's previous experience. The pain experienced during the procedure (0-10), the quality of visualization of the uterine cavity (0-3) and the complications were recorded. The examination was considered successful when the pain score was <4, visualization score was >1 and no complication occurred.

Results

Less pain, better visualization and higher success rates were observed with mini-hysteroscopy (P <0.0001, P <0.0001 and P <0.0001, respectively), in patients with vaginal deliveries (P <0.0001, P <0.0001 and P <0.0001, respectively) and in procedures performed by experienced surgeons (P=0.02, P=NS and P=NS, respectively). The effects of patient parity and surgeon experience were no longer important when mini-hysteroscopy was used.

Conclusions

Our data demonstrate the advantages of mini-hysteroscopy and the importance of patient parity and surgeon experience, suggesting that mini-hysteroscopy should always be used, especially for inexperienced surgeons and when difficult access to the uterine cavity is anticipated. They indicate that mini-hysteroscopy can be offered as a first line office diagnostic procedure.

Progress in transvaginal hydrolaparoscopy.

[Obstet Gynecol Clin North Am.](#) 2004 Sep;31(3):631-9, x.

[Gordts S](#), [Brosens I](#), [Gordts S](#), [Puttemans P](#), [Campo R](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, 3000 Leuven, Belgium.

stephan.gordts@lifeleuven.be

Abstract

Reproductive performance is now more than ever determining the choice of treatment for each individual couple. The easy access to ART treatments, their financial benefits, and the relative high success rate per cycle are at the basis of a liberal referral to these treatments without an accurate diagnosis. The easy and comprehensive investigation by a transvaginal endoscopy as a first-line diagnostic procedure allows for an accurate diagnosis and the choice of the most appropriate treatment.

Investigation of the infertile couple: when is the appropriate time to explore female infertility?

[Hum Reprod.](#) 2004 Aug;19(8):1689-92.

[Brosens I](#), [Gordts S](#), [Valkenburg M](#), [Puttemans P](#), [Campo R](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, B-3000, Leuven, Belgium.

ivo.brosens@med.kuleuven.ac.be

Abstract

While the appropriate method for the investigation of female infertility continues to be debated, the timing of the investigation has received less attention. The current approach is time-consuming, and paradoxically may lead to overtreatment as well as undertreatment. Recent findings on fecundity and the conception window in humans have important implications for the timing of the investigation of female infertility. The findings support the view that fertility-oriented intercourse may have a major impact in reducing the time to pregnancy. Procedures for the investigation of female infertility are becoming less invasive and more accurate, while the therapies for infertility are more effective. It is proposed that under appropriate circumstances female infertility should be investigated after 6 months of fertility-oriented intercourse.

Copyright 2004 European Society of Human Reproduction and Embryology

Comment in

- [Investigation of the infertile couple: a basic fertility work-up performed within 12 months of trying to conceive generates costs and complications for no particular benefit.](#) [Hum Reprod. 2005]

Diagnosis of endometriosis: pelvic endoscopy and imaging techniques.

[Best Pract Res Clin Obstet Gynaecol.](#) 2004 Apr;18(2):285-303.

[Brosens I](#), [Puttemans P](#), [Campo R](#), [Gordts S](#), [Kinkel K](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, Leuven B-3000, Belgium.

ivo.brosens@med.kuleuven.ac.be

Abstract

Although laparoscopy is the gold standard for the diagnosis of endometriosis, the need for this invasive diagnostic tool is a major stumbling-block in both effective clinical management and for research into this common and debilitating disease. As visual inspection of the pelvis has also major limitations, particularly for the diagnosis of posterior pelvis, bowel and bladder endometriosis, it is not surprising that considerable efforts are being made to improve the diagnosis by imaging techniques. Peritoneal endometriosis and ovarian endometriomata are predominantly haemorrhagic lesions. During laparoscopy, these lesions are readily identified by the presence of old or recent bleeding. Both transvaginal sonography and magnetic resonance (MR) imaging have a low sensitivity for the diagnosis of peritoneal and ovarian implants and adhesions. Transvaginal sonography is useful in the diagnosis of ovarian endometriomata, providing the diameter is larger than 2 cm. As transvaginal sonography costs less than MR imaging, transvaginal sonography might be the preferred method of confirming a sizeable endometrioma. Posterior pelvis endometriosis is an infiltrating adenomyotic lesion with microendometriomata. High-resolution transvaginal ultrasonography, and in particular MR imaging, are increasingly used to diagnose the presence and extent of infiltrating lesions and the involvement of rectosigmoid and ureters.

High endometrial aromatase P450 mRNA expression is associated with poor IVF outcome.

[Hum Reprod.](#) 2004 Feb;19(2):352-6.

[Brosens J](#), [Verhoeven H](#), [Campo R](#), [Gianaroli L](#), [Gordts S](#), [Hazekamp J](#), [Hägglund L](#), [Mardesic T](#), [Varila E](#), [Zech J](#), [Brosens I](#).

Source

Institute for Reproductive and Developmental Biology, Wolfson & Weston Research Centre for Family Health, Imperial College London, Hammersmith Hospital, Du Cane Road, London W12 ONN, UK. j.brosens@imperial.ac.uk

Abstract

Background

The success of IVF treatment is dependent upon embryo quality and coordinated growth and differentiation of the endometrium. Aromatase P450 expression in the human endometrium is thought to be restricted to women with proliferative reproductive tract disorders such as endometriosis, leiomyomas and adenomyosis.

Methods

To determine whether endometrial aromatase P450 mRNA expression is prognostic of IVF outcome, we quantified transcript levels in biopsy specimens from a cohort of subfertile patients awaiting IVF treatment using real-time quantitative PCR.

Results

Aromatase P450 transcripts were detected in all endometria examined, although the levels varied considerably between samples, ranging from 0.22 to 486.6 arbitrary units (a.u.). The clinical pregnancy rate in women with high endometrial aromatase P450 mRNA levels ($> \text{or} = 8.3 \text{ a.u.}$; $n = 21$) was 9.5% compared with 30.1% in those patients with low expression levels ($< 8.3 \text{ a.u.}$; $n = 101$) ($P < 0.05$). The cycle day of the endometrial biopsy, cause of infertility, age, parity, number of oocytes collected and number of embryos transferred did not differ between patients with high versus low endometrial aromatase P450 mRNA levels ($P > 0.1$).

Conclusion

Our results indicate that endometrial P450 mRNA levels can identify women at increased risk of IVF treatment failure.

Non-invasive methods of diagnosis of endometriosis.

[Curr Opin Obstet Gynecol.](#) 2003 Dec;15(6):519-22.

[Brosens I](#), [Puttemans P](#), [Campo R](#), [Gordts S](#), [Brosens J](#).

Source

Leuven Institute for Fertility and Embryology, Leuven, Belgium.

ivo.brosens@med.kuleuven.ac.be

Abstract

Purpose of review

Laparoscopy is the gold standard for the diagnosis of endometriosis but the need for visual evidence of the disease is a major stumbling-block for both effective clinical management of

affected patients as well as for research into this common and debilitating reproductive disease. Laparoscopy is invasive and often causes a delay in diagnosis and treatment, especially in symptomatic teenagers and young women. Moreover, the visual inspection of the pelvis has major limitations, particularly for the diagnosis of retroperitoneal lesions. It is therefore not surprising that considerable efforts are being made to improve imaging techniques and to evaluate the diagnostic value of potential molecular markers of disease.

Recent findings

High-resolution transvaginal ultrasonography and, in selected cases, magnetic resonance imaging improve the diagnosis of retroperitoneal pelvic endometriosis as well as the identification of lesions that involve pelvic organs. A variety of serum and endometrial markers are being evaluated for their diagnostic potential, particularly in endometriosis associated infertility. The first gene profiling studies are showing positive results and proteomic technology is being applied to identify novel diagnostic protein expression patterns.

Summary

Current imaging techniques, such as transvaginal ultrasonography, are useful to screen the pelvis for the presence of retroperitoneal endometriosis but fail to diagnose peritoneal lesions, small ovarian endometriomas and adhesions. Postgenomic technologies and identification of novel serum and endometrial markers are likely to revolutionize future diagnosis of endometriosis.

Role of vascular endothelial growth factor and placental growth factor in basal adhesion formation and in carbon dioxide pneumoperitoneum-enhanced adhesion formation after laparoscopic surgery in transgenic mice.

[Fertil Steril](#). 2003 Sep;80 Suppl 2:803-11.

[Molinas CR](#), [Campo R](#), [Dewerchin M](#), [Eriksson U](#), [Carmeliet P](#), [Koninckx PR](#).

Source

Center for Surgical Technologies, Katholieke Universiteit Leuven, Leuven, Belgium.

roger.molinas@uz.kuleuven.ac.be

Abstract

Objective

To evaluate the role of vascular endothelial growth factor (VEGF) and placental growth factor (PIGF) in adhesion formation after laparoscopic surgery.

Design

Prospective, randomized study.

Setting

Academic research center.

Animal(s)

Female wild-type mice and transgenic mice (n = 110), expressing exclusively VEGF-A(164) (VEGF-A(164/164)) or deficient for VEGF-B (VEGF-B(-/-)) or for PIGF (PIGF(-/-)).

Intervention(s)

Adhesions were induced during laparoscopy. To evaluate "basal adhesions" and "CO(2) pneumoperitoneum-enhanced adhesions," the pneumoperitoneum was maintained for a minimum (10 minutes) or prolonged (60 minutes) period. The role of PlGF was also evaluated by administration of antibodies.

Main outcome measure(s)

Adhesions were blindly scored after 7 days.

Result(s)

In all wild-type mice, CO(2) pneumoperitoneum enhanced adhesion formation. In comparison with wild-type mice, basal adhesions were higher in VEGF-A(164/164) mice and similar in VEGF-B(-/-) and PlGF(-/-) mice. Pneumoperitoneum did not enhance adhesions in any of these transgenic mice. The effects observed in PlGF(-/-) mice were confirmed in PlGF antibody-treated mice.

Conclusion(s)

The data demonstrate that the VEGF family plays a role in adhesion formation and confirm that CO(2) pneumoperitoneum enhances adhesions. VEGF-A(164) has a direct role in basal adhesions. Absence of pneumoperitoneum-enhanced adhesions in VEGF-A(164/164), VEGF-B(-/-), and PlGF(-/-) mice indicates up-regulation of VEGF-A(164), VEGF-B, and PlGF by CO(2) pneumoperitoneum as a mechanism for pneumoperitoneum-enhanced adhesion formation.

Role of hypoxia inducible factors 1alpha and 2alpha in basal adhesion formation and in carbon dioxide pneumoperitoneum-enhanced adhesion formation after laparoscopic surgery in transgenic mice.

[Fertil Steril](#). 2003 Sep;80 Suppl 2:795-802.

[Molinas CR](#), [Campo R](#), [Elkelani OA](#), [Binda MM](#), [Carmeliet P](#), [Koninckx PR](#).

Source

Center for Surgical Technologies, Katholieke Universiteit Leuven, Leuven, Belgium.

roger.molinas@uz.kuleuven.ac.be

Abstract

Objective

To evaluate the role of hypoxia inducible factors (HIFs) 1alpha and 2alpha in adhesion formation after laparoscopic surgery.

Design

Prospective, randomized study.

Setting

Academic research center.

Animal(s)

Forty Swiss/129SvJ wild-type mice and transgenic mice partially deficient for the genes encoding for HIF-1alpha (HIF-1alpha(+/-)) or HIF-2alpha (HIF-2alpha(+/-)).

Intervention(s)

Adhesions were induced by standardized lesions during laparoscopy. To evaluate "basal

adhesions" and "pneumoperitoneum-enhanced adhesions," the pneumoperitoneum was maintained for a minimum (10 minutes) or prolonged (60 minutes) period, respectively.

Main outcome measure(s)

Adhesions were blindly scored after 7 days.

Result(s)

In both HIF-1alpha and HIF-2alpha wild-type mice, pneumoperitoneum enhanced adhesion formation. In comparison with wild-type mice, basal adhesions were lower in HIF-1alpha(+/-) and similar in HIF-2alpha(+/-) mice. Pneumoperitoneum did not enhance adhesion formation in HIF-1alpha(+/-) or in HIF-2alpha(+/-) mice. Therefore, in comparison with the correspondent wild-type mice, pneumoperitoneum-enhanced adhesions were lower in HIF-1alpha(+/-) and HIF-2alpha(+/-) mice.

Conclusion(s)

These data confirm that CO(2) pneumoperitoneum enhances adhesion formation and indicate that this effect is mediated, at least in part, by an up-regulation of HIF-1alpha and HIF-2alpha.

Role of the plasminogen system in basal adhesion formation and carbon dioxide pneumoperitoneum-enhanced adhesion formation after laparoscopic surgery in transgenic mice.

[Fertil Steril](#). 2003 Jul;80(1):184-92.

[Molinas CR](#), [Elkelani O](#), [Campo R](#), [Luttun A](#), [Carmeliet P](#), [Koninckx PR](#).

Source

Center for Surgical Technologies, University Hospital Gasthuisberg, Katholieke Universiteit Leuven, Leuven, Belgium. roger.molinas@uz.kuleuven.ac.be

Abstract

Objective

To evaluate the role of plasminogen activator inhibitor-1 (PAI-1), urokinase plasminogen activator (uPA), and tissue-type plasminogen activator (tPA) in adhesion formation after laparoscopic surgery.

Design

Prospective, randomized study.

Setting

Academic research center.

Animal(s)

Seventy female wild-type and transgenic knockout mice for PAI-1 (PAI-1(-/-)), uPA (uPA(-/-)) or tPA (tPA(-/-)).

Intervention(s)

Standardized lesions to induce peritoneal adhesions were performed during laparoscopy. To evaluate basal adhesions and pneumoperitoneum-enhanced adhesions, the pneumoperitoneum was maintained for 10 minutes or 60 minutes, respectively. Peritoneal biopsy samples were obtained during and after 60 minutes of carbon dioxide pneumoperitoneum.

Main outcome measure(s)

Adhesions were blindly scored after 7 days. Concentrations of PAI-1 and tPA were measured by using enzyme-linked immunosorbent assay.

Result(s)

In PAI-1, uPA, and tPA wild-type mice, pneumoperitoneum enhanced adhesions. Compared with wild-type mice, basal adhesions were fewer in PAI-1(-/-) mice and more in uPA(-/-) and tPA(-/-) mice. Pneumoperitoneum did not enhance adhesions in these transgenic mice. PAI-1 concentration increased after 60 minutes of pneumoperitoneum whereas tPA concentration did not change.

Conclusion(s)

Impaired fibrinolysis increases basal adhesions. The absence of pneumoperitoneum-enhanced adhesions in PAI-1(-/-), uPA(-/-), and tPA(-/-) mice and the increase in PAI-1 expression indicate that PAI-1 up-regulation by carbon dioxide pneumoperitoneum is a mechanism of pneumoperitoneum-enhanced adhesion formation.

Submucous and outer myometrium leiomyomas are two distinct clinical entities.

[Fertil Steril](#). 2003 Jun;79(6):1452-4.

[Brosens J](#), [Campo R](#), [Gordts S](#), [Brosens I](#).

Does the editorial board live up to September 10, 2001, expectations?

[J Am Assoc Gynecol Laparosc](#). 2003 May;10(2):308; author reply 308.

[Brosens I](#), [Puttemans P](#), [Campo R](#), [Gordts S](#).

Comment on

- [Transvaginal hydrolaparoscopy](#). [J Am Assoc Gynecol Laparosc. 2002]

Transvaginal laparoscopy.

[Clin Obstet Gynecol](#). 2003 Mar;46(1):117-22.

[Brosens I](#), [Campo R](#), [Puttemans P](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Belgium. ivo.brosens@med.kuleuven.ac.be

Bowel injury in gynecologic laparoscopy.

[J Am Assoc Gynecol Laparosc](#). 2003 Feb;10(1):9-13.

[Brosens I](#), [Gordon A](#), [Campo R](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, B-3000 Leuven, Belgium.

Abstract

Study objective

To review surveys of the last decade on bowel injuries to evaluate the prevalence, causes, management, and outcomes of these events occurring during or as a result of laparoscopy.

Design

Retrospective evaluation (Canadian Task Force classification II-2).

Setting

Surveys and databases.

Patients

None.

Intervention

Data analysis.

Measurements and main results

Combined data show that diagnostic and minor operative laparoscopy are associated with a 0.08% risk of bowel injury, and in major operative laparoscopy the risk increases to 0.33%. Injuries occurring during access and operative procedure decrease significantly with experience, but even in experienced hands injury during access cannot be avoided. Delayed diagnosis remains a major problem. Up to 15% of these injuries are not diagnosed during laparoscopy, and one of five cases of delayed diagnosis results in death. Perioperative diagnosis and immediate repair by laparoscopy or laparotomy reduce the likelihood of severe complications and consequently medicolegal actions.

Conclusions

Several surveys on complications of gynecologic laparoscopy tend to underestimate the risk of bowel injury. Prevention starts by awareness that such injury is an inherent risk of the technique, even in hands of experienced surgeons.

Experience with transvaginal hydrolaparoscopy for reconstructive tubo-ovarian surgery.

[Reprod Biomed Online](#). 2002;4 Suppl 3:72-5.

[Gordts S](#), [Campo R](#), [Brosens I](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, 3000 Leuven, Belgium.

life@lifeleuven.be

Abstract

The transvaginal approach to tubo-ovarian surgery allows easy and direct access to the tubo-ovarian structures and the fossa ovarica without additional manipulation. In the absence of a

panoramic view, the proximity of the tubo-ovarian structures allows operative procedures for treatment of superficial and cystic ovarian endometriosis, drilling of the ovarian capsule, adhesiolysis and salpingostomy. Operative procedures were performed in 78 patients. No conversion to standard laparoscopy was necessary, and no complications occurred. All procedures were carried out on an ambulatory basis with a very low morbidity.

Reproductive disorders affecting fertility in endometriosis.

[Reprod Biomed Online](#). 2002;4 Suppl 3:59-63.

[Brosens I](#), [Campo R](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, B-3000 Leuven, Belgium.

ivo.brosens@kuleuven.ac.be

Abstract

The classical concept of endometriosis as a cause of infertility is challenged. Traditionally, both surgical and medical therapy of endometriosis-associated infertility has focused on eliminating or reducing the visible implants. The classic 6-month medical approach has been a failure, and surgery may moderately enhance fertility, but its benefit in the absence of adhesions is still doubtful. Recent studies have shown that endometriosis is characterized by an aberrant response to sex steroid hormones, resulting in pleiotropic dysfunctions of the reproductive system involving the uterine, peritoneal and ovarian micro-environment. Studies on endometriosis and IVF have been highly relevant in revealing the pleiotropic dysfunctions in patients with endometriosis, although the results should be interpreted with caution. The conclusion seems to support the view that infertility in patients with endometriosis is primarily dysfunctional, rather than lesional, in origin. It is concluded that the place of medical therapy in endometriosis should be reviewed and that the surgical approach needs to be complemented by appropriate medical therapy to restore fertility.

Minimally invasive exploration of the female reproductive tract in infertility.

[Reprod Biomed Online](#). 2002;4 Suppl 3:40-5.

[Campo R](#), [Gordts S](#), [Brosens I](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, 3000 Leuven, Belgium.

rd@pophost.eunet.be

Abstract

Classically, invasive and non-invasive tests are performed to evaluate the causes of infertility. Transvaginal hydrolaparoscopy (THL) allows the exploration of the pelvic structures with a mini-endoscope, using a vaginal needle-guided trocar introduction

technique and saline as a distension medium. A first study on 349 patients demonstrated the feasibility of the procedure and gave a high patient satisfaction. Access to the pouch of Douglas was achieved in 330 patients (94.5%) under local anaesthesia and in an ambulatory environment. The mean pain score measured on a visual analogue scale of 10 was 2.7, comparable to the score of mini-hysteroscopy only and significantly lower than the scores of hysterosalpingography with either metal cannula or balloon catheter. A total of 96% of the patients agreed to repeat the procedure under the same circumstances if required. The diagnostic accuracy of the technique was demonstrated in a prospective study, in which two independent endoscopists explored 10 patients with both THL and standard laparoscopy. The inter-observer agreement for ovarian adhesions was 75% for standard laparoscopy and 90% for THL. In addition, in patients with mild endometriosis, more peri-ovarian adhesions were detected with THL than with standard laparoscopy. A multinational survey to evaluate the risk and outcome of bowel injury during THL registered 24 (0.65%) cases in 3667 procedures. In all cases, the diagnosis was made immediately and the treatment was conservative without complications.

Endoscopic visualization of oocyte release and oocyte retrieval in humans.

[Reprod Biomed Online](#). 2002;4 Suppl 3:10-3.

[Gordts S](#), [Campo R](#), [Brosens J](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, 3000 Leuven, Belgium.

life@lifeleuven.be

Abstract

Transvaginal hydrolaparoscopy (THL) allows the inspection of the tubo-ovarian structures in their natural position without supplementary manipulation. Saline is used at 37 degrees C as distension medium, which keeps the organs afloat. Using this technique it was possible to visualize and record for the first time the process of oocyte release and capture by the fimbriae in humans. THL was performed in the peri-ovulatory period, in order to collect data that would give a better insight into events at the moment of ovulation.

Aromatase P450 messenger RNA expression in eutopic endometrium is not a specific marker for pelvic endometriosis.

[Fertil Steril](#). 2002 Oct;78(4):825-9.

[Dheenadayalu K](#), [Mak I](#), [Gordts S](#), [Campo R](#), [Higham J](#), [Puttemans P](#), [White J](#), [Christian M](#), [Fusi L](#), [Brosens J](#).

Source

Department of Obstetrics and Gynaecology, Ealing Hospital, London, United Kingdom.

Abstract

Objective

To determine whether expression of aromatase P450 mRNA in eutopic endometrium is predictive of the presence of pelvic endometriosis.

Design

A prospective, multicenter, observational study.

Setting

Four tertiary centers for reproductive medicine.

Patient(s)

Sixty subjects of reproductive age undergoing laparoscopy for subfertility exploration, pain assessment, or sterilization.

Intervention(s)

Endometrial biopsy at time of laparoscopy.

Main outcome measure(s)

The expression of aromatase P450 mRNA in endometrial specimens was determined by single-tube reverse transcription-polymerase chain reaction (RT-PCR). Glyceraldehyde-3-phosphate dehydrogenase (GAPDH) mRNA was amplified in parallel to exclude amplification failure.

Result(s)

The RT-PCR amplification was successful in 56 of the 60 biopsies (93%). Pelvic endometriosis was diagnosed in 34 patients (61%) and was strongly associated with aromatase P450 mRNA expression in eutopic endometrium. As a diagnostic marker for endometriosis, aromatase P450 mRNA expression yielded a sensitivity of 82%, a specificity of 59%, a positive predictive value of 76%, and a negative predictive value of 67%. If additional uterine pathology was taken in account, the sensitivity increased to 84%, the specificity to 72%, the positive predictive value to 87%, but the negative predictive value remained unchanged (67%).

Conclusion(s)

Although endometrial aromatase P450 gene expression is highly predictive of the presence of pelvic disease, the relative high incidence of false-negative results and lack of specificity is likely to impair clinical application.

One-stop endoscopy-based infertility clinic.

[Curr Opin Obstet Gynecol.](#) 2002 Aug;14(4):397-400.

[Brosens I](#), [Campo R](#), [Puttemans P](#), [Gordts S](#).

Source

Leuven Institute for Fertility and Embryology, Leuven, Belgium.

ivo.brosens@med.kuleuven.ac.be

Abstract

Purpose of review

The investigation of the infertile couple is currently a highly debated issue. The purpose is to review whether transvaginal hydrolaparoscopy in combination with mini-hysteroscopy and

chromopertubation can be offered as a one-stop infertility investigation.

Recent findings

The technique is based on the direct visualization of the reproductive organs and the presence of tubal patency, and has been clinically validated during the past year for its accuracy, safety and patient tolerance.

Summary

Further prospective randomized studies are required to prove the superiority of transvaginal hydrolaparoscopy in comparison with hysterosalpingography as a first-line **investigation in predicting the fertility outcome.**

Surgical management of endometriomas--compromised ovarian function?

[Fertil Steril.](#) 2002 Jul;78(1):206-7; author reply 207.

[Brosens I](#), [Gordts S](#), [Campo R](#).

Comment on

- [Does ovarian surgery for endometriomas impair the ovarian response to gonadotropin?](#) [Fertil Steril. 2001]

Investigation of the infertile couple: a one-stop outpatient endoscopy-based approach.

[Hum Reprod.](#) 2002 Jul;17(7):1684-7.

[Gordts S](#), [Campo R](#), [Puttemans P](#), [Verhoeven H](#), [Gianaroli L](#), [Brosens J](#), [Brosens I](#).

Source

Leuven Institute for Fertility and Embryology, Tiensevest 168, B-3000 Leuven, Belgium.

Abstract

Transvaginal hydrolaparoscopy (THL) is a new culdoscopic technique for exploration of the pelvic cavity that takes advantage of micro-endoscopic technology and uses aquaflotation for inspection of the tubo-ovarian structures. In infertility patients, THL is systematically combined with mini-hysteroscopy, chromopertubation, fimbrioscropy and, when indicated, salpingoscopy. Mini-hysteroscopy in combination with the chromopertubation test allows accurate assessment of the uterine cavity and tubal patency. The transvaginal access combined with the aquaflotation during THL facilitates detailed inspection of the tubo-ovarian structures and detection of subtle pelvic disease. This combined transvaginal endoscopic approach allows complete evaluation of the reproductive tract. THL is better tolerated than hysterosalpingography, less invasive than standard laparoscopy, and can be used safely as a first line investigation of the female partner in a one-stop infertility clinic.

