Jinekoloji - Obstetrik ve Neonatoloji Tıp Dergisi

Cilt / Vol: 8 Haziran / June 2011 Sayı / No: 30 ISSN 1304 - 5512

The Journal of Gynecology - Obstetrics and Neonatology

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WHICH ENDOSCOPIC WAY IS TRUE TO PREDICT TUBAL PATENCY FOR INFERTILE PATIENT: TRANSABDOMINAL OR TRASVAGINAL

TÜPLERİN AÇIKLIĞININ ÖNGÖRÜLMESİNDE TRANSVAJINAL VEYA TRANSDOMINAL ENDOSKOPIK YONTEMLERDEN HANGİSİ GEÇERLİDİR?

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Geliş Tarihi: 16.04.2011 Kabul Tarihi: 08.05.2011

Abstract

Tubal pathology is a main cause of subfertility. A fallopian tube obstruction occurs in 12% to 33% of infertile couples, and so tubal patency should be investigated early. Transabdominal laparoscopy is suggested as the gold standart for the examination of infertile patient. The aim of this review is to clarify whether transabdominal laparoscopy or transvaginal hydrolaparoscopy is preferable to investigate of tubal patency. Transvaginal hyrolaparoscopy can be the primary diagnostic endoscopic procedure for subfertile women to predict tubal patency.

Keywords: Diagnostic laparoscopy, transvaginal hydrolaparoscopy, fertiloscopy, infertility, tubal patency.

Özet

Tüp patolojileri subferilitenin esas nedenlerindendir. Fallop tüplerinde tıkanıklık infertil çiftlerinin % 13-35'inde oluşur; bu nedenle tüplerin açık olup olmadığı erken dönemde araştırılmalıdır. Bu derlemede transabdominal laparoskopi mi, transvajinal hidrolaparoskopinin mi tüplerin açık olup olmadığının belirlenmesinde tercih edilmesi gerektiği hususuna açıklık getirmesi amaçlanmaktadır.

Transvajinal hidrolaparoskopi subfertil kadınlarda tubal açıklığının ortaya konmasında primer tanısal işlemdir.

Anahtar Kelimeler: Transvajinal laparoskopi, transvajinal hidrolaparoskopi, fertiloskopi, infertilite, tubal açıklık.

Introduction

Patent fallopian tubes are very important for normal human fertility. The fallopian tubes have a critical role in picking up eggs and transporting eggs, sperm, and the embryo. The egg is fertilized in the fallopian tubes. They are needed for sperm capacitation and egg fertilization. The tubes are also important in nutrition and development of fertilized egg. Unfortunately the fallopian tubes are vulnerable to infection and surgical damage, which may impair function of fimbria and endosalphinks.

Tubal pathology is a main cause of subfertility. A fallopian tube obstruction occurs in 12% to 33% of infertile couples, and so tubal patency should be investigated early.

There are several types of tests for the assessment of the functional status of the tubes. Hysterosalpingography (HSG) is the most frequently used imaging method. Meta-analysis has demonstrated that the sensitivity of HSG is 65% for a specificity of 83%. The measurement of chlamydia-antibody-titre (CAT) allows risk assessment

structures, limited degree of manipulation, possibility of only diagnostic examination, necessarity of training and contraindications which comprise retroverted uterus, genital tract infection and cul-de-sac.

Conculusion

Today we can say transabdominal laparoscopy will remain the preferred approach if pelvic pathology requiring surgical treatment is suspected when planning endoscopic surgery. Transvaginal hydrolaparoscopy can be the primary diagnostic endoscopic procedure for subfertile women to predict tubal patency. In the future THL can be alternative to traditional laparoscopy with adequate traning and new instruments.

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both tubes, 1 case had bilateral tubal obstruction).

In contrast to other studies they concluded that transvaginal hydrolaparoscopy may allow limited detailed exploration of the tubo-ovarian structure in some infertile patients. The procedure can be combined with hysteroscopy and dye hydrotubation. Visualization is restricted to the posterior part of the uterus and can judge the uterine contour effectively. However, the whole pelvic inspection process is inferior to that achieved by conventional laparoscopy.

Shibara et al performed the study to investigate the usefulness of THL to evaluate chlamydia trachomatis tubal infertility [9]. Forty-one women with primary and secondary infertility participated in this study. Fourteen had past C. trachomatis infection. In 38 (92.7%) of the 41, access to the pouch of Douglas was obtained. In total, 71 (93.4%) out of 76 adnexa were clearly visualized. Thirty-seven patients were analysed and compared their tubal passages and peritubal adhesions using both hysterosalpingography (HSG) and THL. As a result there were no significant differences in the discrepancy rates between HSG and THL, in patients with and without past C. trachomatis infection. In 14 (58.3%) of the 24 tubes from patients with past C. trachomatis infection and in eight (18.2%) of the 44 tubes from patients without infection, peritubal adhesion was diagnosed only by THL. There was a significant difference in the discrepancy rates of the diagnosis of peritubal adhesion between HSG and THL in the two groups ($P = 0.0007$). These results suggest that C. trachomatis infection is highly associated with peritubal adhesion which is difficult to diagnose by HSG. Therefore, in C. trachomatis antibody-positive patients, exclusion of tubal pathology by THL or standard laparoscopy should be carried out to consider appropriate treatments. Although THL is not a substitute for laparoscopy, it can be proposed as a first line procedure in the early stages of the infertility investigation.

Shibara et al also perfomed THL in 177 infertile women to examine the risk of diagnostic and operative THL and analyzed a review of literature [10]. They disgnosed two cases of bowel injury. In total, the incidence of bowel injury was 1.1%. Ten studies in the literature reported a total of 4232 procedures, including 26 bowel injuries (0.61%) and one perforation of a retroflexed uterus (0.02%). Brosens at al. reported that bowel injury risk is %0.008 for diagnostic laparoscopy but delayed diagnosis and death can be seen.

Discussion

Endoscopic examination of the female genital tract can be performed trough either the abdominal or vaginal route. Decker et al. initially designed vaginal approach in the U.S.A. , in 1944 and subsequently Kelly and Rock depicted in words particularly with detail using the term `Culdoscopy', a technique in which the endoscope is introduced through the posterior vaginal fornix in 1956 . This procedure was later left behind. Because culdoscopy is required the knee-chest position. In addition this difficulty the procedure have view of only the pelvic cavity and risk of infection. More recently, Odent et al. Described the concept of hydroculdoscopy in 1973. Then Mintz et al. modified this technique to perform dorsal decubitus position in 1987.

Approximately ten years later the procedure of transvaginal hydrolaparoscopy (THL) was introduced by Gordts et al. in 1998 [11]. The new concept of fertiloscopy which comprises THL as well as salpingoscopy, microsalpingoscopy and hysteroscopy was introduced in 1998 by Watrelot et al.

Laparoscopy is considered to be the gold standard of pelvic endoscopic procedures. Because it provides panoramic view of the pelvic and abdominal cavities. In addition to diagnostic examination the opportunity to perform extensive surgery is possible with laparoscopy. Disadvantages of diagnostic laparoscopy comprise the need for general anaesthesia, patient's anxiety, the possibility of adhesion formation and risk of complication which can be delayed bowel injury or vessel injury. Some investigators showed that the diagnostic laparoscopy did not show any pathology or only minimal and mild endometriosis in 40–70% of all cases. These findings persuaded some authors to challenge the need for this procedure in the work-up of infertility [12].

Currently fertiloscopy is discussed as an alternative diagnostic laparoscopy in the routine assessment of an infertile woman. In the fertiloscop there is no need for abdominal incisions so scars, and there is almost no risk of vessel injury. Some authors demonstrated that the procedure is considered less painful than standard hysterosalpingography [13]. Many advantages of THL have been claimed: easier use under local anesthesia, lesser risks of complication [14, 15], better cosmetic outcome with, better acceptability by the patients. An examination of the cul-de-sac in which the ovaries and their relation to the fimbriae of the fallopian tubes are easily, where most probably the major event in reproduction, oocyte retrieval by the fimbria, occurs can be performed by THL. More recently, some investigators showed periovarian and peritubal adhesions with THL, which are not easily detected using transabdominal laparoscopy [16 ,17]. Disadvantages of THL include unfamiliar view of pelvic

Casa et al designed a prospectively study on sixty concetive women with unexplained primary infertility [4]. In this study after examination of the whole pelvic cavity, tubal patency was evaluated and immediately after THL, conventional laparoscopy was performed. As a result success rate of accessing the pouch of Douglas and performing THL was found 93.3%. The rate of complete evaluation of all the pelvic structures was 76.8%. In studying tubal pathology, 77.8% agreement was found between the two techniques. Diagnosis of endometriosis was correct in 55.5% of patients. Overall, THL results correlated closely with conventional laparoscopic results in 92.86%, but the diagnostic accuracy of THL was 100% in cases of complete pelvic evaluation.They concluded that THL is a feasible, reliable and safe procedure and can be considered an alternative procedure for evaluating infertility in women. In cases of incomplete pelvic evaluation or abnormal findings, conventional laparoscopy is indicated as the second step in the evaluation.

Nawroth et al evaluated THL in comparison with the already established chromolaparoscopy in the detection of tubal factors, adhesions as well as endometriosis [5]. In this study 43 infertile patients without previous pelvic operations and with an inconspicuous clinical examination were included in a prospective comparative study of THL and chromolaparoscopy. THL succeeded in 40 patients (93.0%). Both methods showed 100% agreement with regard to tubal factors and adhesions. However, only 72/80 tubes (90.0%) could be portrayed by THL. In contrast to this, THL failed to identify 8 of 10 laparoscopically verified endometrioses (isolated endometriosis of the bladder peritoneum in 2). No complications occurred with THL. They concluded THL could be the method of choice for the clarification of mechanical infertility factors in symptom-free patients with no suspicion of pelvic pathologies. Tubal pathologies and/or adhesions (visible during THL) should be indications for laparoscopy. In the case of inconspicuous genitals during THL and a still unfulfilled desire for offspring postoperatively, laparoscopy should be considered in order to exclude the possibility of unidentified endometriosis. Retroflexio uteri should at least be a relative contraindication for THL. Further studies are necessary to evaluate the role of THL in the diagnostic concept of infertility in the future.

Papaioannou et al reviwed the tubal evaluation in the investigation of subfertility [6]. According to this review the authors concluded that when pelvic pathology (adhesions, endometriosis) is not suspected, outpatient procedures (HSG or hysterosalpingo-contrast sonography) are an excellent choice for initial testing. When the findings are inconclusive, or when the patient is suspected to have pelvic pathology, more invasive procedures (laparoscopy, transvaginal hydrolaparoscopy) are recommended for evaluation.

Verhoeven et al. reported on a continuous series of 1,000 patients with infertility and without obvious pelvic pathology who is performed THL [7]. They obtained access and good visualization in 96.8% of the patients. Intraperitoneal bleeding and bowel perforation were the main complications, which after the initial period occurred respectively in 1.9 and 0.1%. They managed all complications conservatively, and no major complication occurred. In 25% of the patients clinically significant pathology was diagnosed, which allowed immediate triage of the patients for further management. They concluded that transvaginal hydrolaparoscopy can be proposed as a first line technique to replace hysterosalpingography and diagnostic laparoscopy in the exploration of patients with unexplained infertility. Because THL is a valuable tool to explore tubo-ovarian structures in patients without obvious pathology. Unnecessary laparoscopy can be avoided in 79 % of the patients. In 21 % of them pathology is diagnosed at an early stage . THL is easy to combine with hysteroscopy and salpingoscopy. The technique is cheap, reproducible, safe, outpatient and without general anesthesia. In their experience, local anesthesia is insufficient, so they prefer analgesia/sedation. On the other hand with THL only diagnostic viewing is possible, as instruments for surgery are not yet available. THL is not easy to learn. Adequate training is mandatory.

Shalakany et al performed the study on twenty two women being referred for diagnostic fertility investigation or for performing benign hysteroscopic surgery (e.g., myomectomy, septum resection) for infertility or recurrent miscarriage reasons [8]. They carried out transvaginal hydrolaparoscopy in all participants under general anaesthesia. As a result entry into the peritoneal cavity was successful in 21 out of 22 (95.5%) cases. The mean duration of the TVHL procedure was 15.6 ±3.2 minutes with a time range from 12 to 19 minutes. The pelvic inspection was excellent in 10 (45.5%), satisfactory in 3(13.6%), unsatisfactory in 7 (31.8%), and failed in 2 (9.1%). In 3 women traditional laparoscopy was performed in the same setting. There were no difficulties in inspecting the posterior wall of the uterus and the uterine contour in all women with septate or bicornuate uterus (n=7) to guide the procedure of septum resection. TVHL detected pelvic pathological findings in 12 (54%) women (4 endometriosis, 3 polycystic ovaries, 2peritubal adhesions, 3 hydrosalpinx). Tubal patency was tested by transcervical dye hydrotubation with methylene blue in 5 (22.7%) cases only (4 of them had normal patent

for tubal pathology. Transvaginal sonography is important to detect hydrosalpinges. Removal of these hydrosalpinges improves the pregnancy chances for IVF.

Laparoscopy give the change of direct visualization of the fallopian tubes, and patency of the tubes can be tested with pertubation with methylene blue. Laparoscopy also allows surgical treatment of mild endometriosis which can be caused proximal tubal oclusion.

Transvaginal hydro-laparoscopy (THL) also allows direct visualization of the fallopian tubes. In contrast to the traditional laparoscopy, can be performed as an office procedure. THL has the advantages of simplicity. In addition simplicity of this procedure, a greater degree of accuracy in evaluation of the ovaries and the distal region of the tubes is possible because of the high magnification used. Falloposcopy and salpingoscopy also can be used for detection of tubal patency. These methods are excluded in this study because of the difficulties of application .

This review is performed to compare traditional laparoscopy with transvaginal hydrolaparoscopy to predict tubal patency for infertile patient.

Material and Methods

A literature search was performed using search engine Google, Highwire Press, Springer Link and library facility available at Laparoscopic Hospital. The following search terms was used : Diagnostic laparoscopy , transvaginal hydrolaparoscopy, fertiloscopy, infertility, tubal patency.

Results

There are a few study to compare traditional laparoscopy with transvaginal hydrolaparoscopy according to diagnostic accuracy, simplicity, duration and complication.

Watrelot et al performed the FLY (Fertiloscopy-Laparoscopy) study to compare the two endoscopic techniques of laparoscopy and fertiloscopy in routine evaluation of the pelvis in infertile women [1]. This study refers, for the first time, to a prospective randomized multicentre study where fertiloscopy was compared with laparoscopy. In this study total of 92 women was selected in 14 University Hospitals to undergo fertiloscopy followed by transabdominal laparoscopy by a team of two surgeons in each hospital. A high degree of concordance was observed between these two techniques, in that if fertiloscopy did not detect any abnormalities, this was also confirmed by laparoscopy. Discordance was observed in similar numbers of cases: eight after laparoscopy and nine after fertiloscopy. The diagnostic index for fertiloscopy and laparoscopy was calculated; sensitivity (86 and 87% respectively) and negative predictive value (64 and 67% respectively) were similar. The kappa index was also calculated for each of the six structures/regions (right/left tube; right/left ovary; peritoneum of pouch of Douglas; posterior uterus), and concordance (0.78 to 0.91) was considered almost complete. They concluded that these results confirm fertiloscopy as a minimall invasive safe procedure that may be considered as an alternative to diagnostic laparoscopy in the routine assessment of women without clinical or ultrasound evidence of pelvic disease. This is considered that fertiloscopy could replace laparoscopy as a routine procedure in such women.

Darai et al conducted a prospective comparative blind trial to assess the feasibility and accuracy of THL compared with diagnostic laparoscopy in infertile women [2]. In this study sixty women were assigned to undergo THL prior to laparoscopy. Findings in terms of tubal pathology, endometriosis and adhesion were analysed. They found the success rate of accessing the pouch of Douglas was 90.2% and complication rate was 1.6 %. THL diagnosis was correlated with that of laparoscopy in 92.3 % of cases. This pilot study showed that THL is a safe and reproductive method. Retroverted uterus should be considered as a relative contraindication to THL. They concluded that when a complete evaluaton by THL is available , it is a highly accurate technique in comparison with the laparoscopy.

Reljic M. and Vlaisavljevic V. showed their own experiences for 24 THL procedures as well as the experiences of foreign authors with this new technique [3]. They reported that THL diagnosis was correlated with that of laparoscopy in 82–93% of cases and no false positive observations were establish. The diagnostic accuracy of THL was 100%, in cases of complete pelvic evaluation. In evaluating tubal patency, they found that there was agreement between the THL and hysterosalpingography in 95% of cases, but THL was superior for the diagnosis of peritubal adhesions. Access to pouch of douglas was successful in 90–96% and both adnexae were fully visualized in 77–93% of women. They reported In 0.65% of procedures extraperitoneal rectum injury, which was also the most common complication of THL. They concluded that. THL is a safe, accurate, minimal invasive and well tolerated diagnostic method which could replace HSG and/or laparoscopy in some cases but its role in infertility evaluation is not yet clearly defined.