European Journal of Obstetrics & Gynecology and Reproductive Biology 158 (2011) 285–288

Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Predisposition of subtle endometriotic lesions predominantly on the left side assessed by transvaginal hydrolaparoscopy (THL)

S. Kissler [a,*], K. Marx [a], M. Scholtes [a], S. Pfeiffer [b], W. Meier [c], J. Neulen [d]

[a] Interdisciplinary IVF-Centre Duesseldorf, Germany
[b] Laboratory Benrath, Interdisciplinary IVF-Centre Duesseldorf, Germany
[c] Department of Gynaecology & Obstetrics, Evangelisches Krankenhaus Duesseldorf, Academic Teaching Hospital of the Heinrich Heine University Duesseldorf, Germany
[d] Department of Gynaecologic Endocrinology and Reproductive Medicine, RWTH Aachen, Germany

ARTICLE INFO

Article history:
Received 23 January 2011
Received in revised form 4 April 2011
Accepted 30 April 2011

Keywords:
Transvaginal hydrolaparoscopy (THL)
Endometriosis
Adenomyosis
Utero-tubal transport disorder

ABSTRACT

Objective: Endometriosis is one of the most frequent gynaecological disorders being associated with infertility. Hence, the early detection of endometriosis in infertility patients is of importance for the treatment modalities in infertility. Transvaginal hydrolaparoscopy (THL) offers an accurate, safe and quick diagnostic tool, not only for the evaluation of the fallopian tubes but also for the detection of very subtle endometriotic lesions in the early stages of endometriosis.
Study design: Between January 2008 and January 2010, we conducted a study in order to evaluate the prevalence, extent and localisation of endometriosis via the new technique of THL in infertility patients. 239 patients with a mean age of 33.9 years underwent THL after having given informed consent.
Results: In 237 patients, access to the cul-de-sac was successfully achieved. Endometriosis was detected in 77 of 237 cases (32.5%). In 85.7% of cases, the endometriotic lesions were classified as very small (ASRM stage I°). Predominantly, the small lesions were found merely on the left side of the patient's peritoneal cavity: in 43 cases (55.8%), endometriosis was detected strictly on the left side, whereas the disease was detected on the right side in only 5 patients (6.5%). In 29 patients, endometriosis could be detected in both sides of the pelvis (37.7%). The differences in the side-dependent distribution were statistically highly significant ($p < 0.0001$). In most of the cases, the subtle endometriotic lesions affected the ovarian surface superficially (53.5%) or the peritoneum of the lateral pelvic wall (25.6%).
Conclusions: These data clearly indicate that there is a high prevalence of endometriosis in patients with infertility. THL is an accurate, safe and quick method for a thorough examination of the female pelvis besides the patency of the fallopian tubes. The high prevalence of left-sided subtle endometriotic lesions must be interpreted that during THL a very early process in the development of endometriosis can be observed. Even minimal to mild endometriosis might lead to a significant restriction in uterotubal transport capacity whose integrity is directly correlated to normal pregnancy rates. The extent of the accompanying adenomyosis is directly correlated to the loss of intact uterotubal transport capacity.

1. Introduction

Endometriosis is still defined by the presence of viable endometrial tissue outside the uterine cavity and is one of the most common gynaecological disorders in women's reproductive age [1]. This definition is based on Sampson's observation that retrograde menstruation is the underlying condition for the development of pelvic endometriosis [2].

Based on more recent results from endometriosis research, the disease might be regarded as a displacement of basal endometrium with stem cell potential into the peritoneal cavity due to uterine hyperperistalsis [3]. At the same time, chronic uterine hyperperistaltic activity can lead to the infiltration of basal endometrium into myometrial dehiscences that are simultaneously caused by the disturbed uterine peristaltic activity. This inevitably leads to adenomyosis (endometriosis genitalis interna) that can be regarded as a phenomenon developing simultaneously with the progress of pelvic endometriosis via metaplasia of the endometrial stroma within the deepest muscular layers of the uterus [4].

According to the most recent literature, the development of endometriosis and adenomyosis can even be regarded as signs of chronic uterine tissue injury and repair (TIAR), where chronic uterine peristaltic activity induces microtraumatisation whose

* Corresponding author at: Academic Teaching Praxis, Interdisciplinary IVF-Centre Duesseldorf, Voelklinger Strasse 4, 40219 Duesseldorf, Germany.
Tel.: +49 0211901970; fax: +49 02119019750.
E-mail address: s.kissler@ivf-duesseldorf.de (S. Kissler).

0301-2115/$ – see front matter © 2011 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ejogrb.2011.04.044

repair is accompanied by increased local paracrine oestrogen synthesis. The permanent hyperperistalsis continues like a self-perpetuation of the disease process [5].

Adenomyosis, which can be diagnosed via MRI in a high percentage of up to 75–87% in patients with proven endometriosis [6,7], may play a crucial role in infertility [4,8]. Hysterosalpingoscintigraphy (HSSG) is a method used to evaluate the active sperm transport inside the female genital tract by uterine muscular contractions. While this method gives evidence that patients suffering from endometriosis show impeded hyperperistaltic or dysperistaltic utero-tubal transport capacity, the transport capacity is almost abolished if an adenomyotic component can be diagnosed [8,9]. As a result, pregnancy rates in impaired utero-tubal transport function – as in the condition of endometriosis – remain low [10].

Therefore, the early detection of even low-grade endometriosis of the pelvis in patients with infertility remains of crucial importance. Transvaginal hydrolaparoscopy (THL) enables a rapid and accurate diagnosis of pelvic abnormalities, such as very subtle lesions of endometriosis on the ovarian surface or the pelvic peritoneum, in addition to the status of the fallopian tubes.

The method of transvaginal hydrolaparoscopy was first published by Gordts et al. [11] and continued its development by Watrelot et al. [12]. Besides its very low complication rate, it was moreover reported that very subtle changes in the anatomy of the female pelvis in endometriosis can be diagnosed accurately, while they might be overlooked during standard laparoscopy [13,14].

It has been reported in recent literature that ovarian endometriomas are more common in the left ovary than in the right ovary [15], an observation which has been confirmed in a limited number of studies [1,16]. This encouraged us to examine our infertility patients using the THL procedure in order to study the prevalence, extent and localisation of endometriosis in our infertility patients.

In the context of the new data regarding the pathogenesis of endometriosis, infertile patients can be properly advised on optimum treatment of endometriosis-related infertility.

2. Materials and methods

Between January 2008 and January 2010, $n = 239$ patients with unexplained infertility underwent THL at the IVF Centre in Duesseldorf. The mean age of the patients was 33.9 years (min: 22 years, max: 45 years). During infertility work-up, every new patient at our IVF Centre is advised to undergo THL. There was no predominant inclusion in the study because of endometriosis-related symptoms such as dysmenorrhoea. All surgery was carried out by the responsible author (SK) and was performed in an ambulatory surgery setting. Informed consent for surgery and participation in the study was obtained from all patients. Fixed retroflection of the uterus or obliteration of the cul-de-sac served as contraindications for THL. In all cases, a short general anaesthesia via larynx mask was performed. Mean duration of anaesthesia was 18 min. Patients were dismissed 60 min after the end of the anaesthesia after the control of vital parameters. All surgery was started with a diagnostic hysteroscopy which was performed using the same optic. Access to the cul-de-sac was achieved via a special transvaginal endoscopy set for hydrolaparoscopy (Karl Storz®, Tuttlingen, Germany) consisting of a special Veress needle, a dilatation trocar and a 2.9 mm endoscope with a 30° optic angle. After accessing the peritoneal cavity, a sterile sodium infusion of approximately 200 ml served as dilution medium for THL. The examination starts with a thorough inspection of both ovaries, pelvic walls with peritoneal surface (fossae ovaricae) and both fallopian tubes. The back side of the uterus serves as a landmark for exact orientation. During this inspection, very subtle lesions mainly of the serosal surface of the ovary (Figs. 1 and 2) or on the pelvic peritoneum can be observed.

After inspection of the female pelvis, dye pertubation of the fallopian tubes is performed using an intrauterine catheter system (Rüschcatheter®, Teleflex Medical GmbH, Kernen, Germany) and a diluted blue contrast solution.

After completing inspection of the female pelvis, the trocar system and the optic are removed; the vaginal incision is inspected and remains open.

The patients return for a postoperative visit after one week.

3. Results

Access to the cul-de-sac was achieved in 237 of 239 patients (99.2%). In 2 cases, access to the pelvic cavity was not possible. In another 3 cases, minor complications were noticed such as difficult general view (2 cases) or one minor bleeding from the peritoneum (1 case). Thus, the total complication rate was 2.1%.

In the 237 patients, endometriosis was detected in 77 cases (32.5%). Most findings showed very subtle lesions of endometriosis on the ovarian surface or the peritoneum of the pelvic wall including the sacro-uterine ligaments as shown in Figs. 1 and 2. Sixty-six cases (85.7%) were estimated as stage I° according to the revised classification of the American Fertility Society, 1985 [17]. Nine patients (11.7%) showed stage II° endometriosis and 2 patients (2.6%) were classified as stage III° endometriosis. Predominantly, endometriosis was found on the left side of the patients: in 43 cases (55.8%) endometriosis was detected strictly on the left side, whereas the disease was only detected in 5 cases on the right side (6.5%). In 29 cases, endometriosis could be detected on both sides of the pelvis (37.7%), (Table 1). Altogether, in 72 cases (93.5%), besides other localisations, minimal endometriosis could at least be detected on the left side of the peritoneal cavity. The differences were statistically highly significant ($p < 0.0001$, two-sided binomial test). Concerning the left-sided endometriosis, in most cases (23/43) the surface of the ovary was affected superficially (53.5%). None of these patients showed an ovarian endometrioma. In 11 cases (25.6%) endometriosis was detected strictly on the peritoneum of the left pelvic wall and sacro-uterine ligaments, and in 9 cases (20.9%) both the ovary and peritoneum were affected by endometriosis (Table 2).

In the examined patients in whom endometriosis was detected, a bilateral tubal occlusion was diagnosed in 2 cases (2.6%) and a unilateral tubal occlusion in 15 cases (19.5%). The sides of tubal closure were equally distributed.

The 2 patients who were classified as having endometriosis of stage III° were advised to undergo an operative laparoscopy. One patient followed this advice, one conceived after a successful IVF-treatment.

4. Comments

THL is a safe, accurate and very convenient method for the patient. It is used to evaluate fallopian tube patency and, even more importantly, to examine patients' pelvic conditions such as endometriosis. Due to its convenience for the patient, THL can be performed at a very early stage in infertility work-up and therefore provides a timely, accurate diagnosis. Delay in the diagnosis of endometriosis is a well-known phenomenon since patients often refuse to undergo standard laparoscopy. Delay in the diagnosis of endometriosis is estimated at approximately 8–11 years in patients with pain as the cardinal symptom of endometriosis [18].

The data in this study clearly show that there is a high prevalence of endometriosis in patients with infertility (32.5%),