

LAPAROSCOPIC TREATMENT OF WOMEN IN THEIR REPRODUCTIVE AGE WITH PELVIC INFLAMMATORY DISEASE

Efthimios Deligeoroglou, Antonios Kondoravdis, Ioannis Koutoukos, Panagiotis Christopoulos, Dimitrios Giannaris, Nikolaos Kondoravdis

2nd Department of Obstetrics and Gynaecology, University of Athens, - Aretaieion Hospital, Athens, Greece

Indirizzo per corrispondenza: Panagiotis Christopoulos, MD

1 Hariton Str., Kifissia, - 14564 Athens, Greece

Tel. +30 210 7217835; fax +30 210 7233330; e-mail: edeligeo@aretaicio.uoa.gr

ABSTRACT

To evaluate the use of laparoscopy in pelvic inflammatory disease (PID) of women in their reproductive age. Forty-seven women aged between 18 and 38 years old, with PID were admitted to our Hospital from January 1998 to January 2001 and were retrospectively reviewed. Twenty-two patients showed minor signs of inflammation and were treated with antibiotics. The remaining twenty-five patients were treated both laparoscopically and with antibiotics. Fourteen of these patients were treated laparoscopically, of whom several for the second time, due to recurrence of the disease. Within the second group, 71.2% of the patients had acute PID, 13.4% had multiple adhesions and signs of past inflammation and the remaining 15.4% had no signs of inflammation. Diagnosis and treatment were more valuable and more accurate when laparoscopy was performed and a higher ASRM (American Society of Reproductive Medicine) score, although statistically non significant, was achieved. Laparoscopy does not seem to affect the fertility of the women subjected to it.

Key words: *pelvic inflammatory disease, laparoscopy, fertility, reproduction*

INTRODUCTION

Pelvic Inflammatory Disease (PID) is an infection of the upper genital tract, which probably results in ectopic pregnancy, infertility and chronic pelvic pain. Its diagnosis and treatment have been of major interest to gynecologists. Clinical criteria (1), laboratory findings, ultrasound (transvaginal and transabdominal) (2), magnetic resonance imaging (MRI) (3) and laparoscopy provide the necessary information regarding PID. The clinical diagnosis is often inaccurate and since laparoscopy has long been the standard of reference in the diagnosis of PID (4, 5), ultrasound (especially transvaginal.) (6-8) and MRI (9), assist the gynecologist in the differential diagnosis of PID. Laparoscopic confirmation of the disease not only avoids delays in implementing directed therapy, but it also allows an accurate assessment of its severity (9). It substantially affects recurrence of the disease and minimizes adhesion formation according to the American Society of Reproductive Medicine (ASRM) score – providing good diagnosis and fertility rate to the woman during her reproductive age (10). Having in mind that the purpose of this study is to emphasize on the prognostic and therapeutic value of laparoscopy in adolescents and women in a reproductive state with PID, we nevertheless should acknowledge the necessity of laparoscopy in puberty, to avoid infertility in the succeeding reproductive life.

MATERIALS AND METHODS

The population included in this retrospective review, consisted of forty-seven women aged between 18 and 38 years, studied from

January 1998 to January 2001. Approval was obtained from the "Aretaieion" Hospital Ethics Committee and informed consent from the patients participating in the study. Women eligible for the study were those complaining of lower abdominal pain of less than three weeks duration, cervical motion pain, adnexal tenderness and positive rebound. The patients were divided into two groups, according to the severity of their clinical evaluation. The first group consisted of twenty-two women with minor signs of PID and the second group consisted of twenty-five women with more obvious signs of infection. Pyrexia higher than 38°C, erythrocyte sedimentation rate higher than 15mm/h and a white blood cell count higher than 10.000 / mm³ were evaluated; abnormal vaginal discharge and irregular vaginal bleeding were also assessed. Urinary frequency and dysuria were recorded on urinary symptoms (4) (Table I).

A palpable mass was detected in several of these women. Women who were pregnant (β -hCG in urine) or had undergone an abortion, labor, or other surgical procedures within ten weeks were excluded (1). The groups were then submitted to ultrasound in order to evaluate the morphology and circumstantial pathology of their pelvises.

Pyosalpinx and hydrosalpinx, tubo - ovarian abscess or complex formation, salpingitis, concomitant salpingitis and endometrioma, ovarian tumor, abdominal fluid in the Douglas pouch, endometrioma, ovarian cyst, with or without torsion, were observed. There was no ultrasound information regarding some of the patients in the test. Transvaginal and transabdominal sonography were both used in the patients subjected to it, since transvaginal sonography qualifies for the identification of inflamed fallopian tubes, periovarian inflammation and the differential diagnosis of pyosalpinx, tubo-ovarian complex

Table I: Clinical features

Symptoms	Group A		Group B	
	n	%	n	%
Lower abdominal pain & cervical motion pain with adnexal tenderness & positive rebound less than 3 weeks	22	100	25	100
Pyrexia (Temp>38°C)	4	18	10	40
Abnormal vaginal discharge	16	72	20	80
Irregular vaginal bleeding	6	27	10	40
Dysuria	8	36	13	52
ESR>15mm/h	8	36	13	52
W.B.C.>10000	10	45	23	92
Palpable mass	0	0	13	52
PID history> 1 month	22	100	25	100
Negative pregnancy test	22	100	25	100
Contraceptive method	22	100	25	100
Abortion, labour, surgical procedure <10 weeks	0	0	0	0

and tubo-ovarian abscess. Transabdominal sonography is superior in recognizing fluid in the Morrison pouch and loculated pelvic fluid collections (3, 9, 8, 2). (Table II)

Table II: Ultrasound features

Ultrasound features	Group A	Group B
Pyosalpinx – hydrosalpinx	1	6
Tubo ovarian abscess	0	8
Salpingitis	6	3
Endometrioma & salpingitis	0	2
Ovarian mass	0	2
Fluid in the Douglas pouch	2	1
Endometrioma	2	1
Ovarian cyst – torsion	0	1
No features	11	1
Total	22	25

Microbiological examination for the detection of Chlamydia trachomatis, Neisseria gonorrhoea, Mycoplasma Hominis, anaerobic and aerobic bacteria was performed. The specimens were collected from the uterine cervix, vagina and ovaries, at the time of laparoscopy. The specimens from the vagina were placed in Stuart's (CLR) transport medium and following that inoculated in agar plates for due detection of bacteria (blood agar, McConkey, Chapman, Sabouraux). For the culture of N. gonorrhoea, the same media as well as chocolate agar were used. In order to make the sensitivity test, antibiogram was performed, using the ATB-plus system. An Amplicor Chlamydia trachomatis (Roche) diagnostic system was used for C. trachomatis. Using the polymerase chain reaction (PCR) in a Gene Amp PCR system 2400 (Perkin Elmer), we achieved enzymatic multiplication of

the target DNA. The reaction follows a 30-circle program in two different temperatures. Multiplication of the DNA, after hybridization, is measured by the ELISA chromatometric method in 450nm. For this purpose, Abidine-horseradish peroxidase was used as a conjugate and tetramethylbenzidine (TMB) as a chromogen.

When laparoscopy was indicated, a pneumoperitoneum with 2 liters of CO₂ was achieved under general anesthesia. Two trocars were used, a 10mm umbilical and a 5mm suprapubic, through which needle aspiration of the pyosalpinges was achieved. Laparoscopy was performed in all patients of the second group and evaluation was achieved by using the Jacobson and Westrom Grade of acute pelvic inflammation (11, 12). Grade I is a mild inflammation characterized by erythema and oedema of the ovary and remain observable with no laparoscopic sign of exudate. Grade II is a moderate pelvic inflammation with erythema, oedema, and decreased mobility of the ovaries, total occlusion and exudate. Grade III represents a severe form of PID with laparoscopic findings of pyosalpinx or tubo-ovarian abscess. Diagnostic laparoscopy involves the culture of microbes, abdominal cavity and fallopian tube morphology, while reparative laparoscopy is necessary for the aspiration of pyosalpinx, hydrosalpinx and abscess, fallopian mobilization, adhesiolysis, removal of the fallopian tube(s), salpingotomy and excision of endometriomas.

All patients were treated with intravenous Metronidazole, Cefoxitine and Doxycycline for the first three days and oral antibiotic therapy for the subsequent twelve days according to the antibiogram of the culture media (Metronidazole, Doxycycline, or Cefaclor).

Statistical analysis was done using the chi-squared test (x²), to compare distributions, while the probability was calculated with the standard value of p=0.05.

RESULTS

Forty-seven women were referred to hospital for PID. Sonography demonstrated: 1 woman with pyosalpinx / hydrosalpinx, 6 with salpingitis, 2 with abdominal fluid in the pouch of Douglas, 2 with endometrioma and 11 women with no visual

sign of pathology for group A. In group B, 6 women were sonographically suspected to have pyosalpinx or hydrosalpinx, 8 with tubo-ovarian abscess, 3 with salpingitis, 2 women with concomitant endometrioma and salpingitis, 2 with ovarian tumor, and 1 with fluid in the pouch of Douglas, 1 with endometrioma, 1 with ovarian cyst and 1 with no sign of pathology.

The microbiological examination of the vagina, cervix and ovaries of these women revealed a high prevalence of Chlamydia trachomatis (Table III).

Acute Chlamydial salpingitis (n = 25 / 47) involved 52% of the patients, while Neisseria gonorrhoea isolated from 8 women (n = 8 / 47) involved 16%. Mycoplasma hominis (n = 19 / 47) involved 40%. Anaerobes (n = 15 / 47) 32% and aerobes (n = 4 / 47) represented 8%

Table III: Microbiological examination

Microbiological examination	n=47: A + B groups	%
<i>Chlamydia trachomatis</i>	25	52
<i>Neisseria gonorrhoea</i>	8	16
<i>Mycoplasma hominis</i>	19	40
Anaerobes	15	32
Aerobes	4	8

of the population.

At laparoscopy, involving only the study group B, 2 women were evaluated as grade I according to Jacobson and Westrom, 3 in grade II and 12 in grade III representing 71,2% of the total subjected population (n = 47) with PID.

The patients included in laparoscopic grade III were equally divided, since 6 had a tubo-ovarian abscess and 6 pyosalpinx.

One patient with acute appendicitis was found and was subjected to appendectomy. Adhesions with no sign of acute inflammation of the pelvis represented 12% of the Group B (n = 3 / 25). Although Group B had major clinical prevalence, 4 women (n = 4 / 25) (16 %) had no signs of acute inflammation. Pelvic adhesions, according to the ASRM, were found in 1 patient of grade I and were characterized as minimal, one mild adhesion in the women of grade II and 11 in grade III. These were mostly mild and moderate implying the importance of their lysis. There were 2 minimal and 1 mild adhesions among the women without obvious laparoscopic acute inflammation; however these were signs of adhesions and there was 1 minimal adhesion among the 4 women with no laparoscopic sign of inflammation.

Recurrence of the disease in 9 woman of Group A (n = 9 / 22) (41 %) was actually greater than that of Group B (n = 5 / 25) (20 %) but the difference was not statistically significant ($\chi^2=1.55$, Pr=0.213, p>0.10 N.S.).

These women were subjected to further laparoscopy. Three (n = 3/9) women of Group A (33%) were laparoscopically graded with: 1 for PID, 3 (n = 3/9) (33%) with grade II and 2 (n = 2/9) (22%) with grade III. One (= 1/9) (11%) woman had no sign of acute inflammation with adhesions. The entire population in this group had established adhesions (n = 9/9) (100%). The Group B had a better prognosis with 2 (n = 2/5) (40%) women of grade I, one (n=1/5) 20% of grade II and there was no one with grade III of laparoscopic severity of the disease. Two (n = 2/5) (40%) women had only adhesions in their pelvises and a much higher ASRM adhesion score was given to the recurrence PID patients of the second group (n = 4/5) (80%), although comparing the ASRM adhesion scores of the two groups there was no statistically significant difference ($\chi^2=0.096$, Pr=0.7570 N.S., Fisher test Prob.=0.305). There were 8 complications in the series. Four patients (16%) presented nausea and vomiting, 3 (12%) scapular pain and there was 1 case (4%) with emphysema. 2 cases resulted in laparotomy (Table IV).

DISCUSSION

The majority of women reporting pelvic pain symptoms may be expected to explicit physical abnormality during laparoscopy. According to an assessment, made by Stout, Steege, Hudes (4), this is mainly endometriosis or adhesions, and the location of the abnormality almost always corresponds to the location of the pain. During another case study, Wagaarachchi and Fernando (5) demonstrated that if laparoscopy had not been used to confirm acute PID,

24% of patients with possible PID would have been over treated with expensive broad-spectrum antibiotics.

It is imperative that appropriate diagnosis and treatment be established in all patients with pelvic pain in order to prevent any further establishment of future infertility and chronic pelvic pain, secondary to adhesion formation due to pelvic inflammation. Antibiotic therapy of tubo-ovarian complexes is insufficient because of fibrin deposition at the inflammatory sites, which serves as a barrier to in situ destruction of pathogens by neutrophils (13). Removal of fibrinous exudate and purulent material, intraovarian abscess aspiration and povidone iodine lavage, complemented by proper antibiotic therapy, appears to minimize the risk of future problems according to Sanfillipo and Lobe (13). Appropriate chemotherapy for acute salpingitis should always include a specific antichlamydial agent (1). Acute chlamydial salpingitis is seen in younger women (mean age 23) who tend to present with later than women with non-chlamydial disease,

Table IV: Second look laparoscopy

Laparoscopy due to recurrence of PID	Group A		Group B	
Laparoscopic grade	n	%	n	%
Grade 1	3	33	2	40
Grade 2	3	33	1	20
Grade 3	2	22	0	0
Past inflammation – Adhesions	1	11	2	40
No sign of inflammation	0	0	0	0
Total	9		5	
ASRM adhesions				
Minimal	2		3	
Mild	4		1	
Moderate	3		0	
Total	9	100	4	80

are more likely to give a history of irregular vaginal bleeding (1). Laparoscopy evaluates the salpinx, ovaries and pelvic organs, making possible the diagnosis of endometrioma and pelvic adhesions. The ovarian tubes are seen during laparoscopy by methylene blue infusion although it is possible to evaluate the mucosa of the salpinx by direct salpingoscopy using a non-flexible salpingoscope. Compared to salpingography, laparoscopy is more effective in revealing perisalpingeal adhesions (10). According to the same assessment, 50% of the patients undergoing laparoscopy, revealed some degree of pathology. Where laparoscopy represents the standard of reference in the diagnosis of PID, magnetic resonance imaging has an overall accuracy of 93% and ultrasonography 80% (9), with transvaginal sonography providing superior anatomical detail in the evaluation of patients with PID, thus demonstrating abnormalities not seen in 71% of patients (6). Diagnostic laparoscopy performed in patients with acute abdominal pain of unknown etiology provides diagnostic accuracy as well as therapeutic capabilities and prevents unnecessary laparotomy (14). It provides fast and accurate information regarding the female pelvis, without impairing fertility (15). Clinical, laboratory and laparoscopic findings of the women in these series, revealed an important

decrease in the recurrence of the disease in women subjected to early laparoscopy for PID diagnosis and treatment (1). Being worthwhile in patients with chronic iliac fossa pain, laparoscopic appendicectomy should also be considered in the young (16). Laparoscopy has minimized the non-PID cases that were managed in the acute phase, which is highly cost effective (17). Second-look laparoscopy after treating acute salpingitis carries accurate evaluation of the reproductive function (18). Even though laparoscopy is a surgical procedure and the majority of women with the disease continue to be diagnosed and managed as outpatients, as they were a decade ago (19), the women in our study achieved a higher, although non-statistically significant, ASRM score. We believe that further data is required to provide accurate evidence on fertility. There is strong belief that fertility is not only similar, but it also improves in those women subjected to early laparoscopy for PID, compared to those treated with conventional methods. Recurrent clinical symptoms and laboratory signs of PID should be an indication for confirming or excluding the clinical diagnosis by laparoscopy (20). Recent studies have shown that future fertility is not compromised and in some cases may be improved with laparoscopic treatment (21).

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