ORIGINAL ARTICLE

The comparison of microlaparoscopy and laparoscopy in pelvic region assessment in infertile women

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Abstract

OBJECTIVES: To compare the efficacy of microlaparoscopy and laparoscopy in the assessment of pelvic region in infertile women.

MATERIALS AND METHODS: 47 patients (aged 24–35) had microlaparoscopy and subsequent laparoscopy performed in order to diagnose the cause of infertility. Pelvic region assessment was performed in both procedures and the results were afterwards compared in regard to duration of the operations and findings reported by independent surgeons. The data was statistically analyzed using Statistica for Windows 5.1.

RESULTS: There were no major differences in the assessment of the pelvic region and found abnormalities in the analyzed postoperative protocols. All the diagnosed abnormalities were described similarly by both surgeons; the differences referred only to subjectively evaluated sizes of findings. The assessment of the pelvic region during microlaparoscopy was fully satisfactory in all cases, none required earlier than scheduled conversion to laparoscopy. The duration of endoscopic procedures was calculated from the moment of trocars insertion into the peritoneal cavity. The average duration time of microlaparoscopic evaluation was 6'20"±45", while in laparoscopy – 3'40"±32" ($p<0.0001$).

CONCLUSIONS: Microlaparoscopy and laparoscopy are of similar efficacy in the assessment of small pelvis organs and in detecting pathological changes. Both procedures differ significantly only in regard to the duration.

INTRODUCTION

Nowadays it is difficult to imagine the effective diagnosis of infertility without endoscopic tools, especially laparoscopy. It is widely used in precise diagnosis and treatment of diseases and congenital abnormalities of female genital tracts. Over the last two decades, the dynamic technical progress resulted in a widespread of this method. Such diseases as uterine myomas, endometriosis, polycystic ovarian syndrome and benign ovarian tumors are successfully treated with laparoscopy with the same result as in laparotomy, but the overall risk (intraoperative complications, infections, duration of recovery, cosmetic effect) of the operation is much lower [9]. According to the general tendency in medicine to introduce the procedures of lower invasiveness, some of the laparoscopic operations may now be performed in microlaparoscopy, where the diameter of tools is 5 to 10 times smaller than in conventional laparoscopy [4,11,15]. Microlaparoscopy is mainly used in reproductive medicine, as it fulfills the expectations of both the patient and the doctor. For women of reproductive ages, the result of the operation is often subjectively judged by the scarring, not by the real clinical outcome, which is the same in microlaparoscopy as in laparoscopy. However, it should be remembered that microlaparoscopy as a surgical procedure has its limitations.

MATERIAL AND METHODS

The study group consisted of 47 patients, ages 24 to 35 (average 29±5.4), who were admitted to the 1st Clinic of Obstetrics and Gynaecology, Medical University of Warsaw, in order to have the cause of infertility diagnosed. The pelvic region was assessed with the use of microlaparoscopy, and subsequently laparoscopy, in each of the patients.

Microlaparoscopy was performed with 2.2 mm trocars (Pajunk), 2.2 mm graspers and monopolar needle (Pajunk) and 2.0 mm optics by Stryker. The technique of the procedure was almost the same as conventional laparoscopy with 5–10 mm graspers and trocars, only with lower pressure in peritoneal cavity (12 mmHg). The incisions after microlaparoscopy do not require sutures, strips are usually placed for a few days to close the margins of the skin. Photographs 1 and 2 show both procedures.

The results were compared afterwards in regard to the duration of the operations and the findings in the pelvic region reported by surgeons during both types of procedures.

The assessment of the pelvic region was performed according to the routine protocol: uterus, oviducts, ovaries, peritoneal surface, appendix, liver and bowels. The presence of adhesions and/or fluid in peritoneal cavity and characterization of abnormalities were precisely described in the specially prepared protocol. For endometriosis the AFS (American Fertility Society) scale was used.

The introduction of microlaparoscopic tools was the first step in all patients. After the assessment was performed by one surgeon, the tools were changed to conventional laparoscopy and the evaluation was repeated by another surgeon not present in the operating room during microlaparoscopy. In order to avoid intraobserver bias, the protocols were afterwards completed by the two independently. Both protocols were compared. The special protocol is shown in Figure 1.

The durations of both procedures were calculated very thoroughly, from the introduction of trocars to their replacement (microlaparoscopy to laparoscopy) and then to their withdrawal.

The results were statistically analyzed, using Statistica for Windows 5.1, where p-value <0.05 was statistically significant.

RESULTS

There were no major differences in the assessment of the pelvic region and found abnormalities in the analyzed postoperative protocols. All the diagnosed abnormalities (ovarian cysts, adhesions, uterine myomas) were described similarly by both surgeons; the differences referred only to subjectively evaluated sizes of findings.

In two cases of laparoscopy ovarian cysts were found, and their descriptions did not vary between the observers. There were five cases of subserous uterine myomas, 1–2 cm in diameter. Two patients had peritoneal adhesions. Both surgeons described changes typical of endometriosis in 13 patients: in two of them I°according to AFS, in four - II°, in six - III° and in one patient - IV°. In two cases minimal superficial endometrial foci (up to 5 mm in diameter), localized on the peritoneum in the neighborhood of urinary bladder, were not detected. However, it had no influence on the endometriosis total in AFS. Free peritoneal fluid was present in 12 women – in all cases it was a small amount of reddish follicular fluid in the pouch of Douglas. Fresh blood was not observed in any of the cases. Six patients had small periovuductal cysts (up to 15 mm in diameter). Nine women had no abnormalities found during the operation.

The assessment of the pelvic region during microlaparoscopy was fully satisfactory in all cases, none required earlier than scheduled conversion to laparoscopy.

The duration of endoscopic procedures was calculated from the moment of trocars insertion into the peritoneal cavity. The average time of the assessment in laparoscopy was 3'40"±32" and microlaparoscopy – 6'20"±45". T-Student test for paired samples was used to compare both groups, resulting in p-value <0.0001, thus there is a statistically significant difference in the two procedures.

DISCUSSION

In the beginning of the new century, doctors dealing with human reproduction are facing a great challenge. The lifestyle and carrier requirements make women

postpone their decision of childbearing closer to the age of 30, which results in the increasing number of infertility. However, the diagnostic possibilities in the field of infertility have indeed benefited in the technical progress. Infertility clinics have become popular in many countries. They get more information about patients in a shorter time, using least invasive procedures [12,16]. Microlaparoscopy is one of the tools to do it. Since the introduction of this procedure, several studies have been published describing the use of microlaparoscopy in the pelvic region assessment.

Childers et al. described successful use of 1.8 mm optics in gynecological oncology in cancer staging [3]. Risquez et al. published the results of the peritoneal cavity assessment in 30 patients with the use of tools 1.4 mm in diameter. The time of the procedure varied from 1 to 15 minutes, the ability to visualize the region was judged as "acceptable". It should be stated that the study was conducted in 1993 and endoscopic tools were very thin even as for that time [13]. According to Risquez, microlaparoscopy can be used as an alternative to laparoscopy but the quality of the view is worse, which may result in misdiagnosis [14]. Bauer et al. conducted microlaparoscopy (1.9 mm optics), followed by laparoscopy, in 54 patients. They did not notice any statistically significant differences in diagnosis, although in two cases of microlaparoscopy smaller abnormalities were not described (a change in the oviduct and a change on ovarian surface) [2]. Karabacak et al. compared both endoscopic methods in 37 women – according to them microlaparoscopy is not a good diagnostic method in cases of infertility and chronic pelvic pain. To support their opinion they mentioned lesser view quality and the difficulties resulting from the fragility of tools. In many cases the tools 1.75 mm in diameter prevented the operator from moving the organs and getting the credible view [10]. It therefore seems that the appropriate qualification of patients to the procedure is of basic importance before microlaparoscopy is successfully applied.

Faber et al. compared the effectiveness of microlaparoscopic (2 mm) assessment of abdominal cavity organs and AFS endometriosis totals. It was followed by laparoscopic evaluation. Each procedure was conducted by a different surgeon, who dictated his report to an independent person directly after the operation was finished. No significant differences were noticed in regard to intraoperative diagnosis, and the difference in AFS total of endometriosis did not exceed 6 points [5]. We obtained similar results in the above study. However, in the majority of endoscopic operations in youngsters, the abnormalities cannot be removed through the small incisions. Therefore the application of microlaparoscopy is justified in an early diagnostic stage of an operation only. If an abnormality of a bigger size is expected, the conventional laparoscopic operation should be scheduled [8].

Haeusler et al. conducted a very interesting research on 52 women. They performed diagnostic laparoscopy on patients with infertility, chronic pelvic pain and suspected endometriosis. Microlaparoscopy was again followed by laparoscopy. The picture was registered on the video tape and watched by an independent endoscopic surgeon afterwards. He graded the ability of small pelvis organs visualization as perfect, sufficient or insufficient. The quality of view did not differ in the majority of cases, where the diagnostic abilities were graded as perfect or sufficient. However, the significant difference was noted in patients with intraperitoneal adhesions: microlaparoscopic image was usually insufficient, whereas laparoscopic sufficient [6].

The above statement also confirms our thesis that microlaparoscopy can be useful in simple diagnostic operations. In case of any doubts, conversion to laparoscopy is essential. Moreover, microlaparoscopy requires more time to examine the same area, because of the smaller diameter of optics. Additionally, rapid movements can result in the loss of continuation in the field of vision, thus, gentle slower movements of the tools and experience of the surgeon are crucial for the results. The longer duration of microlaparoscopy is described in most of the cited literature, which was also confirmed in our research.

The majority of studies showed similarities in the assessment of small pelvis region in both laparoscopy and microlaparoscopy. The differences usually applied to small superficial endometrial foci, omitted in microlaparoscopy. However, it generally had no influence on further treatment.

The abilities of visualizing organs and structures of the peritoneal cavity are smaller in microlaparoscopy comparing to laparoscopy. First of all, the length of microscopic tools (12 cm) is not sufficient for example, to visualize the pouch of Douglas or to perform the procedure in obese women. Secondly, the microlaparoscopic image on the screen is about half the size of the one gained during laparoscopy. Moreover, the intensity of light is much smaller because of the diameter of the optics and it results in a darker view. In practice the view gets lighter when the optics are closer to the organs. That causes the above mentioned problems with movements and easiness of losing the field of vision. In most microlaparoscopic optics produced so far the angle of the field of vision is 0 ° comparing to 30 ° in conventional laparoscopy, which causes difficulties in visualizing the structures of the pouch of Douglas. The additional difficulty during microlaparoscopy is the necessity to have tools and optics very close to the organ surface, which can be hazardous. It therefore requires more precision and experience of both surgeons performing the procedure.

The small size of microlaparoscopic tools is in most cases at its disadvantage, although sometimes it can be beneficial. In patients after abdominal surgeries, the presence of peritoneal adhesions with bowels may be the main reason of organ damage in laparoscopy (especially gastrointestinal tract). The introduction of a "safe" trocar, 2 mm in diameter, with a possibility of instant placement of optics into peritoneal cavity reduces the risk of

complication. On the other hand, microlaparoscopic optics inserted in the lower abdomen, in mid-clavicular line, may serve as a control for "safe" introduction of main laparoscopic trocar in the umbilical site [1].

Endoscopy is generally harder to perform with the large amount of fluid (blood) in the peritoneal cavity. Apart from the difficulty in visualizing the structures in the small pelvis, the vaporization of optics occurs. Such a situation causes major problems during microlaparoscopy, where the field of vision and the ability of fast reaction are limited. Conversion to laparoscopy or laparotomy in these cases is much safer. However, taking modern diagnostic possibilities into account (ultrasonography, blood morphology, biochemical examination), the qualification to a proper procedure can be done before the surgery.

Microlaparoscopy will never replace conventional laparoscopic surgery, but it can be successfully used for diagnostic purposes. Moreover, it is the only one of the above mentioned operations to be performed in local anesthesia with mild sedation, which proves its usefulness for example, in one day infertility clinics [12]. The possibility of performing surgery under sedation may result in shorter hospitalization, lower hospital costs, and easier anesthetic procedures [7].

CONCLUSIONS

Microlaparoscopy and laparoscopy are of similar efficacy in the assessment of small pelvis organs and in detecting pathological changes. Both procedures differ significantly only in regard to the duration.

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