THE ROLE OF DIAGNOSTIC OF HYSTERO LAPAROSCOPY IN EVALUATION OF THE INFERTILITY

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ABSTRACT

Background: Female infertility constitutes one of the commonest problems in gynecological practice. Infertility is defined as failure to achieve pregnancy during one year of frequent, unprotected intercourse. This study aimed to evaluate the role of the combined laparoscopy and hysteroscopy in the diagnosis and treatment of infertile female. Patients and Methods: This retrospective study was conducted at gynecologic endoscopic unit in zagazig university hospital during the period from December 2020 to May 2021. Included two hundred infertile women were divided by the following percent 1:1 primary to secondary infertile cases. Group I; 50% patients with primary infertility, Group II; 50% patients with secondary infertility. Women aged 20-40 years with normal hormone profile without male factor infertility were included. Results: The frequency of women with arcuate uterus is significantly increased in group I than group II, Frequency of women with arcuate uterus; bicornuate and very small uterine cavity are significantly increased in group I than group II and the frequency of women with intrauterine synechia and bilateral narrow cornal end are significantly higher in group II than group I. Conclusions: laparoscopy and hysteroscopy play very important role as diagnostic and therapeutic tools in the infertile women. Combined diagnostic simultaneous laparoscopy and hysteroscopy should be performed in all infertile patients before the treatment.

Keywords: Hysteroscopy; infertility; laparoscopy

I. INTRODUCTION:

Infertility is defined in specific terms as failure to conceive after one year of unprotected regular intercourse. A broader view of infertility includes, not being able to carry a pregnancy to term and have a baby(1). Infertility affects about 10% - 15% of couples of childbearing ages. A malfunction in the fallopian tubes is responsible for 40 50% of cases, while uterine problems are estimated at about 15% of cases and other factors include an ovulation defect of 20 30% of cases. Laparoscopic findings of endometriosis in majority of primary infertility and PCOS in majority of secondary infertility patients along with other pathologies(2). Laparoscopic surgery, is a minimally invasive surgery (MIS), band aid surgery, or keyhole surgery, is a modern surgical technique in which operations in the abdomen are performed through small incisions (usually 0.5–1.5cm) as opposed to the larger incisions needed in laparotomy. Keyhole surgery displays images on TV monitors to magnify the surgical elements. Laparoscopic surgery includes operations within the abdominal or pelvic cavities. It belongs to the broader field of endoscopy(3). Hysteroscopy is a well-established diagnostic and operative technique. Hysteroscopic procedures are highly appreciated mainly for their minimal invasiveness, suitability for office gynecology, cost effectiveness and safety(4). Combined laparoscopy and hysteroscopy is considered the gold standard for evaluation of causes infertility; as the advantages of combined hysteroscopic and laparoscopic approach is proper assessment of the distal tubes and ovaries, peritoneal cavity, and the elimination of tubal spasm as a factor of infertility, absence of radiation, more precise application of instruments and confirmation of achievement of tubal patency during the procedure(5). So,
the aim of this study was to evaluatethe role of the combined laparoscopy and hysteroscopy in the diagnosis and
treatment of infertile female..

Patients and Methods:

This retrospective study was conducted at gynecologic endoscopic unit in zagazig university hospital during the
period from December 2020 to May 2021. included two hundred infertile women who were divided into two
groups; Group I; 50% patients with primary infertility, Group II; 50% patients with secondary infertility.The
study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work was
carried out for studies involving humans in accordance with the World Medical Association's Code of Ethics
(Helsinki Declaration).

Sample size:two hundred patients were involved in the study, all fulfilled the following criteria; Patients between
20 and 40 years of age. Primary or secondary infertility of more than 1 year duration were included in the study.
Primary infertility patients were those who had never conceived before, while secondary infertile patients had at
least one prior conception, irrespective of the outcome. Normal hormonal profiles for infertility e.g. (serum FSH,
LH). Ultrasonic folliculometry was suggestive of ovulation. Normal thyroid function.Normal prolactin
level.Normal semen analysis.

Exclusion Criteria:

Women under 20 or above 40 years old.Hormonal abnormalities known to cause anovulation like thyroid
having any contra-indication for laparoscopy as chronic chest disease, cardiac and marked obesity.…
etc.Womenwho have marked adhesions suggested by history.Suspicion of pregnancy, to avoid the possibility of
disrupting an implanting gestation. So, patients examined in the early proliferative phase of the cycle.Symptoms
suggestive of pelvic or lower genital tract infection, to avoid exacerbating the symptoms.Patients with advanced
or uncontrolled medical disease e.g. DM or rheumatic fever or T.B.

All patients subjected to the following; History taking from patient records. Physical examination from patient
records: complete physical examination including (blood pressure, height, weight, thyroid examination, breast
examination and bimanual examination). Male partner is evaluated by urologist for congenital anomalies,
testicular……etc.

Female partner has so many factors to be evaluated for infertility includes the following factors; Ovarian factor,
Pelvic adhesion, Bilateral tubal obstruction, Uterine factor, Cervical factor and Vaginal factor.

Investigation of infertility has been observed including (semen analysis for her husbanded, serum F.S.H, L.H,
serum prolactin level, ovulation assessment and hysterosalpingography …etc.). Transvaginal ultrasound and
folliculometry. Routine preoperative investigations has be done (CBC, random blood sugar, liver function,
kidney function, PT, PTT, INR, ECG, Viral markers HBV, HCV, HIV, and urine analysis).

Hysteroscopy surgical technique:

The patient was placed in the dorsal lithotomy position. The thighs should be at a 90 degree angle to the table in
order to create enough space for the surgeon to manipulate the hysteroscopy. The patient perineum should be just
out the edge of the table. Normal saline was used for uterine distension connected to the inflow channel on the
sheath with intravenous tubing. A vaginal disinfection with a non-irritating watery disinfection solution was
performed without placing speculum. Before the hysteroscopy and sheath were inserted into the external os, the
sheath was flushed to remove the air.

The tip of the hysteroscopy was positioned in the vaginal introitus, the labia being slightly separated with fingers.
The vagina was distended with saline. The scope was driven to the posterior fornix to readily visualize the portio
and slowly backwards to identify the external cervical os. When this is become visible, the scope was carefully
moved forward to the internal os to follow the black spot to internal os and toward uterine cavity, titled 30 degree
trying not to touch side walls to be pain free and with least possible trauma.

The uterine cavity was systematically explored by rotating the fore-oblique scope in order to identify any
anomaly in the uterine walls and/or the right and left tubal ostia. Systematic examination of all four walls of the
uterine cavity and the tubal openings is carried out with axial movements of the telescope. The endometrium is
smooth and pink white in color during the proliferative phase and lush and velvety in the secretory phase. Any abnormal pathology was documented.

Finally the evaluation and finding data were written in details by the surgeon and the technique of the procedure was done according to the surgeon evaluation and patient condition. Any complications in the form of pain, bleeding, vasovagal attack and perforation, were registered in the patient sheet.

**Laparoscopic surgical technique**

The patient is placed in a supine position with abduction of lower limbs and with flexion of the thighs onto the pelvis of about 20°. This position allows concomitant abdominal and vaginal access without the need to change the position of the patient. In order to avoid injuries of the brachial plexus, the two arms are positioned alongside the body. The placement of the lower limbs should avoid compression of the sciatic nerve, external popliteal nerve, and calves. The buttocks of the patient should project slightly beyond the edge of the operating table to facilitate the uterine manipulation.

Classically, pneumoperitoneum is insufflated using the Veress needle placed at the Palmer’s point (left hypochondrium, 2–3 cm below the costal margin, at the mid clavicular line). At this level, pneumoperitoneum creation is easy even in obese patients

After the skin incision, a 10 mm trocar is placed inside the umbilicus for the zero-degree laparoscope. Systematically, we use three ancillary trocars: two 5 mm trocars for the main surgeon and one 5 mm trocar for the assistant surgeon. The two lateral trocars are placed about 2 cm medial to the anterior-superior iliac spine (and always lateral to the inferior epigastric vessels), and the third trocar is infra umbilical, in the midline, about 8–10 cm below the umbilical trocar.

**II. STATISTICAL ANALYSIS:**

Statistical analysis was done using IBM© SPSS© Statistics version 22 (IBM© Corp., Armonk, NY, USA) and MedCalc© version 13 (MedCalc© Software bvba, Ostend, Belgium). Data were expressed as mean ± standard deviation for quantitative variables and as number and percentage for qualitative ones. The chi-square, ANOVA and paired t tests were used for interpretation of results. A P-value of $\leq 0.05$ was considered statistically significant.

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**III. RESULTS:**

**Table (1): Demographic data.**

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>p</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>25.7±3.8</td>
<td>30.1±3.3</td>
<td>0.001</td>
<td>6.05</td>
</tr>
<tr>
<td>X±SD range</td>
<td>18-35</td>
<td>24-38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of infertility</td>
<td>4.5±2.8</td>
<td>5.86±2.6</td>
<td>0.012</td>
<td>2.5</td>
</tr>
<tr>
<td>(years)</td>
<td>1-13</td>
<td>2-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X±SD range</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic findings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group I</td>
<td>Group II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=100</td>
<td>N=100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal findings</td>
<td>14</td>
<td>12</td>
<td>0.09</td>
<td>0.76</td>
</tr>
<tr>
<td>N %</td>
<td>14.0</td>
<td>12.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1; showed that age of women and duration of infertility were significantly lower in group I compared to group II. Abnormal findings by laparoscopy were comparable between two groups.

**Table (2): Uterine laparoscopic findings in both groups**

<table>
<thead>
<tr>
<th>Laparoscopic findings</th>
<th>Group I N=100</th>
<th>Group II N=100</th>
<th>p</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N %</td>
<td>N %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Abnormal uterine findings

<table>
<thead>
<tr>
<th></th>
<th>Group Π</th>
<th>Group Ι</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcuate uterus</td>
<td>4.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Subserous fibroid</td>
<td>3.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Table 2; showed that the frequency of women with arcuate uterus is significantly increased in group Ι than group Π.

Figure 1; showed that the frequency of women with bilateral distal tubal block in group Π than group Ι.

Table 3; showed that there is significance differences among the frequency of women with endometriosis in both two groups.

Table 3: Peritoneal laparoscopic findings in both groups.

<table>
<thead>
<tr>
<th>Laparoscopic findings</th>
<th>Group Π</th>
<th>Group Ι</th>
<th>P</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=100</td>
<td>N=100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endometriosis</td>
<td>5  5.0</td>
<td>3  3.0</td>
<td>0.005*</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* significance

Table 3; showed that there is significance differences among the frequency of women with endometriosis in both two groups.

Figure 2; showed that there was significant differences as regard tubal milking, linear salpingotomy and salpigectomy significantly increased in group Π than group Ι.
Figure (2): Surgical procedure by laparoscope among the two groups.

Figure (3): showed that the frequency of women with arcuate uterus, bicornuate uterus and very small uterine cavity are significantly increased in group I than group II. And the frequency of women with intrauterine synechia and bilateral narrow corneal end are significantly higher in group II than group I.
The results of this study showed that, the mean age of patients in group one was 25.7±3.8 and of group two was 30.1±3.3, so the age of group one was significantly lower than the age of group two. And the result also showed that the mean of duration of infertility in group one was 4.5±2.8, but the mean of duration of infertility in group two was 5.86±2.9, so the mean of duration of infertility was significantly lower in group one compared to group two. This comes with Haider et al (6), who reported that Out of 200 subfertile patients total 30 patients were selected for laparoscopy. 20 (66%) patients were in primary infertility group while 10 (33%) patients were in secondary infertility group. 11 (55%) patients of primary infertility belong to age group of 18-25 years while 6 (60%) patients of secondary infertility belong to age group of 26-33 years. Mean duration of subfertility at time of presentation in primary infertility group was 1.95 years while in secondary infertility was 2.70 years.

The current study showed that, Laparoscopic findings in group one was abnormal in 14 (14%) women and in group two was abnormal in 12 (12%) women, this means that there is no significant difference regarding abnormal laparoscopic findings in the two groups. This is not in agreement with Shetty (7), who reported that 50 infertile women underwent laparoscopy during the study period, 32(64%) had primary infertility while 18 (36%)
secondary infertility, 8 (25%) patients with primary and 2 (11.1%) patients with secondary had no visible abnormality.

In this study, the frequency of women with arcuate uterus in group one was 4 (4%), but was 2 in group two. This means that the frequency of women with arcuate uterus is significantly higher in group one than group two. This is in agreement with Chan et al(3), who reported that, the prevalence of uterine anomalies diagnosed by laparoscopy was 8.0% in infertile women, 13.3% in those with a history of miscarriage and 24.5% in those with miscarriage and infertility.

In this study, the frequency of women with endometriosis in group one was 5 (5%) and in group two was 3 (3%). This means that there was significant difference between two groups that was higher in in primary infertility group. This is in agreement with Haider et al(6), who reported that, 30 patients were selected for laparoscopy. 20 (66%) patients were in primary infertility group while 10 (33%) patients were in secondary infertility group. The most common cause observed in patients with primary infertility, was endometriosis spots which accounted for 11 (55%) with associated symptoms (dysmenorrheal, dyspareunia and irregular cycles). In secondary infertility tubal occlusion was more common which accounted for 3 (30%).

In this study, tubal laparoscopic findings in both two groups were defined as the frequency of women with peritubal adhesion in group one was 2 (2%) and in group two was 4(4%).This means that the preitubal adhesion was significantly higher in group two than in group one. This is in agreement with Shetty(7), in his study reported that, Pelvic inflammatory disease (PID) was found in 1 (3.1%) and 2 (16.7%) cases of primary and secondary infertility respectively. Peritubal adhesions were detected in 2 (6.3%) cases with primary infertility and 4 (22.2%) cases with secondary infertility.

Also Hu XL et al(8), reported that there was no significant difference in the percentage of uni- and bilateral tubal patency cases between two groups (69.4% versus 68.9%). There was significant difference in the percentage of pelvic adhesions in primary infertility cases and in secondary infertility cases (42.9%, versus 60.7%). Similar to ours, Bhandari et al(9), reported endometriosis and adnexal adhesions as the commonest abnormalities detected at laparoscopy evaluation of 546 patients with infertility.

According to our results with abnormal laparoscopic findings in studied patients with, laparoscopic evaluation of these patients is a useful tool in the work-up of those patients with both diagnostic and therapeutic benefits.

In this study, hysteroscopic findings was normal in 58% in group one and 48% in group two. This is not in agreement with Elbareg et al(12), who reported that out of 200 patients with infertility in whom standard infertility investigations were normal who underwent hysteroscopic evaluation 135 (67.5%) patients showed normal uterine cavity, while abnormal cavity was detected in 65 (32.5%) of patients.

Intrauterine adhesions was 7% in second group and no detected cases of first one. This is not in agreement with, Elbareg et al(12),reported mild endometrial adhesions in their patients with infertility was (28/200,14%) .

Single endometrial polyp was 7% in the first group and 6% in the second one. Endometrial polyps impair endometrial receptivity as evidenced by lower endometrial HOXA10, and HOXA 11 receptivity markers in patients with endometrial polyps.

Endometrial polyp was the commonest hysteroscopic uterine abnormality representing (10.13%) and (19.05%) in 100 women with primary and secondary infertility respectively reported by Shobha et al(13).
uterine anomalies were significantly higher in group one than group two, while the frequency of women with intrauterine synechiae was 0 in group one but was 7 in group two, the frequency of women with bilateral narrow corneal ends was 3 in group one but was 10 in group two, this means that intrauterine synechiae and bilateral narrow corneal ends were significantly increased in group two than group one.

V. CONCLUSIONS:
Combined laparoscopy and hysteroscopy is important in evaluating the infertile women, where the combined procedures shorten the investigation time, proper assessment of the distal tubes and ovaries, the elimination of spasm as a factor, absence of radiation, more precise application of instruments and confirmation of achievement of tubal patency during the procedure.

REFERENCES: