

## Is Laparoscopy Necessary In All Infertile Patients?

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### Summary:

This study has assessed the value of clinical examination and transvaginal sonography as alternative to laparoscopy in the investigation of infertility. Between January 1997 and December 1997, 245 cases of infertility (primary and secondary) were evaluated. Depending upon the duration of infertility, cases were categorized into two groups:-

Group I (n = 135), long term infertility of more than 5 years.

Group II (n = 110), short term infertility of less than 5 years.

In both groups, laparoscopic findings were compared with clinical feature (C.F.) and transvaginal ultrasonographic findings (TVUS). Group I gave a sensitivity of 34.2%, a specificity of 83.7% and positive and negative predictive value of 74.3% and 50% respectively while Group II gave a sensitivity of 60.6%, a specificity of 100% and positive and negative predictive values of 100% and 67.1% respectively. This shows that, in patients with short term infertility, laparoscopy is optional, justified only when clinical findings and transvaginal sonography findings are abnormal. In long term infertility, laparoscopy is imperative for diagnosis as well as treatment of pelvic pathologies.

### Introduction:

The current practice of performing laparoscopy to investigate all infertile women, may not be necessary. In theory, women with normal pelvis could avoid surgery if they were initially screened, using less invasive tests such as transvaginal sonography. Transvaginal sonography has been successfully introduced in the treatment of infertility, and plays an important role in the diagnosis and treatment of infertile women. It enables identification of pelvic pathologies, monitoring and follicular growth during controlled ovarian hyperstimulation for assisted reproductive techniques, oocyte retrieval in invitro fertilization cycles and diagnosis of intrauterine and extrauterine early pregnancy. However, diagnostic laparoscopy is still considered the gold standard in the infertility workup, to assess the presence of pelvic pathologies that might interfere with fertility.

The aim of this study, was to investigate

prospectively the role of clinical examination and transvaginal sonography in infertile women, undergoing laparoscopy for infertility workup and to analyse the predictive value of clinical examination and transvaginal sonography in differentiating the normal from the pathological pelvis in comparison with laparoscopy.

### Materials and Methods:

This study was conducted at the department of OBGYN, KMC Manipal from January 1997 to December 1997, in all infertility patients (Primary and secondary) attending our clinic.

A total of 245 patients were subjected to clinical examination, transvaginal sonography and HSG or laparoscopy.

Signs and symptoms of dysmenorrhoea, dyspareunia, dull aching pain and menstrual irregularities were taken into account.

A scan was considered normal when uterus had normal morphology, no abnormal uterine contour, absence of en bloc movement of uterus and adnexa, and adnexae in their normal anatomical position, free of ovarian masses, hydrosalpinges and other pelvic pathologies. On laparoscopy, the uterus, pelvic peritoneum, tubes and the ovaries were carefully observed.

To analyse the predictive value of clinical examination and transvaginal sonography, in differentiating normal pelvis from pelvic pathologies that might benefit from surgery, the sensitivity, specificity, positive and negative predictive values were calculated. The patients were categorized into two groups:- Group I (n= 135) with long term infertility of >5 years; Group II (n=110) with short term infertility of < 5 years.

### Results:

Comparison between clinical examination and laparoscopy in screening of pelvic pathology is shown in Table I. Normal clinical features were reported in 205 patients, in remaining 40, 5 patients had abnormality diagnosed by clinical examination and history. A normal pelvic finding was confirmed in 119 (58.4%) patients by laparoscopy. Of the 86 (41.6%) patients with normal clinical examination and abnormal laparoscopic findings, majority had tubal pathology (hydrosalpinx, cornual block), minimal endometriosis and adnexal, omental and bowel adhesions, thus indicating presence of subtle disease.

Laparoscopic confirmation of pelvic pathology was reported in 35 (87.5%) patients with abnormal clinical findings. Abnormal clinical findings in 5 (12.5%) patients was not confirmed on laparoscopy. The sensitivity (indication of accuracy in predicting normal pelvis) was 28.9% and specificity (indication of accuracy in predicting abnormal pelvis) was 95.9%. The positive and negative predictive value was 87.5% and 58.5%. Correlation between transvaginal ultrasonography and laparoscopy in screening of pelvic pathology is shown in Table II. Normal transvaginal sonography was reported in 193 patients, in remaining 52, 3 had pathology diagnosed by transvaginal sonography. Normal pelvic findings were confirmed in 115 (59.5%) patients by laparoscopy. Seventy eight (40.4%) patients with normal transvaginal sonography and abnormal laparoscopic findings had tubal pathology (hydrosalpinx, cornual block), minimal endometriosis and pelvic adhesions, thus showing that TVUS was unable to detect subtle endometriosis.

Laparoscopic confirmation of pelvic pathology was reported in 49 (94.2%) patients with abnormal scans. Accuracy of transvaginal sonography in predicting normal pelvis was 34.8% and abnormal pelvis was 97.4%. The positive and negative predictive values being 94.2% and 59.5%.

Correlation between clinical examination and transvaginal sonography with laparoscopy in group I (long term infertility), is shown in Table III. Normal clinical

**Table 1: Correlation between clinical examination and laparoscopy in screening of pelvic pathology**

| Clinical examination<br>(Symptoms & signs) | Laparoscopy results |                 |       |
|--|---------------------|-----------------|-------|
|  | Abnormal Findings   | Normal Findings | Total |
| Abnormal findings<br>(n=40)                | 35 (87.5%)          | 5 (12.5%)       | 40    |
| Normal findings<br>(n=205)                 | 86 (41.6%)          | 119 (58.4%)     | 205   |
| Total                                      | 121                 | 124             | 245   |

Sensitivity : 28.9%                      Specificity : 95.9%  
Positive predictive value : 87.5%      Negative Predictive value : 58.5%

**Table II: Correlation between transvaginal ultrasonography (TVUS) and laparoscopy in screening of pelvic pathology**

| TVUS Findings               | Laparoscopy results |                 |       |
|-----------------------------|---------------------|-----------------|-------|
|                             | Abnormal Findings   | Normal Findings | Total |
| Abnormal findings<br>(n=52) | 49 (94.2%)          | 3 (5.8%)        | 52    |
| Normal findings<br>(n=193)  | 78 (40.4%)          | 115 (59.5%)     | 193   |
| Total                       | 137                 | 118             | 245   |

Sensitivity : 35.8%                      Specificity : 97.4%  
Positive predictive value : 94.2%      Negative predictive value : 59.5%

**Table III : Long term infertility (> 5 years) (n=135) Correlation between clinical examination and TVUS with laparoscopy in screening of pelvic pathology.**

| Clinical examination<br>& TVUS findings | Laparoscopy results |                 | Total |
|---|---------------------|-----------------|-------|
|   | Abnormal Findings   | Normal Findings |       |
| Normal finding<br>(n=35)                | 26 (74.3%)          | 9 (25.7%)       | 35    |
| Abnormal findings<br>(n=100)            | 50 (50%)            | 50 (50%)        | 100   |
| Total 135                               | 76                  | 59              | 135   |

Sensitivity : 34.2%      Specificity : 83.7%  
 Positive predictive value : 74.3%      Negative predictive value : 50%

findings and transvaginal sonography findings were reported in 100 patients while in remaining 35, 9 were diagnosed by clinical findings and transvaginal sonography and abnormal laparoscopic findings, consisted of tubal pathology, mild endometriosis and pelvic adhesions group, again indicating the role of laparoscopy in detection of occult pathology. Laparoscopic confirmation of pelvic pathology was reported in 26 (74.3%) patients with abnormal scans. In 5 (25.7%) patients with normal pelvis, clinical findings and scan showed menstrual irregularities associated with polycystic ovaries in two cases, ovarian cyst in one case and small submucous leiomyoma in two cases. Indication of accuracy of clinical examination and transvaginal sonography in predicting normal pelvis was 34.2%, abnormal pelvis was 83.7% and positive and negative predictive value were 74.3% and 50% respectively.

Correlation between clinical features and transvaginal sonography with laparoscopy in screening of pelvic pathology in group II (short term infertility), is shown in Table IV.

Normal clinical findings and transvaginal sonography were reported in 73 patients, and in remaining 37 no pathology was found. A normal pelvic finding was confirmed in 49 (67.1%) patients on laparoscopy. Twenty (32.9%) patients with normal clinical features and transvaginal sonography, had abnormal laparoscopic findings, mainly tubal pathology, minimal endometriosis and pelvic adhesions. Laparoscopic confirmation of pelvic pathology was reported in 37 (100%) patients with abnormal clinical features and transvaginal sonography findings. The indication of accuracy of clinical features and transvaginal sonography in predicting normal pelvis was 60.6%, abnormal pelvis was 100% and positive and negative predictive value were 100% and 67% respectively.

#### Discussion:

In this study, we investigated the sensitivity, specificity, positive and negative predictive values and the accuracy of clinical examination and transvaginal sonography in screening of pelvic pathologies in an infertile population, submitted to laparoscopy.

**Table IV : Short term infertility (< 5 years) (n=110) Correlation between clinical examination and TVUS with laparoscopy in screening of pelvic pathology.**

| Clinical examination<br>& TVUS findings | Laparoscopy results |                 | Total |
|---|---------------------|-----------------|-------|
|   | Abnormal Findings   | Normal Findings |       |
| Normal finding<br>(n=37)                | 37 (100%)           | 0               | 37    |
| Abnormal findings<br>(n=73)             | 24 (32.9%)          | 49 (67.1%)      | 73    |
| Total 110                               | 61                  | 49              | 110   |

Sensitivity : 60.6%      Specificity : 100%  
 Positive predictive value : 100%      Negative predictive value : 67.1%



Clinical examination alone had a sensitivity of 28.9% and specificity of 95.9%. Transvaginal sonography had a sensitivity of 35.8% and specificity of 97.4%.

In patients with long term infertility of more than 5 years, combined clinical examination and transvaginal sonography had a sensitivity of 34.2%. Analysis of false negative cases indicated mainly tubal pathology (hydrosalpinx, cornual block, rigid tube), followed by mild endometriosis and pelvic adhesions. The specificity was 83.7%. Analysis of false positive cases revealed small submucous leiomyomas, small ovarian cyst and polycystic ovaries. In patients with short term infertility of less than 5 years, combined clinical features and transvaginal sonography had sensitivity of 60.6%. Analysis of false negative cases revealed mainly tubal pathology, mild endometriosis and pelvic adhesions. The specificity and positive predictive value were high that is 100%, thereby indicating the high accuracy of clinical history and examination and transvaginal sonography in detecting abnormal pathology. Laparoscopy mainly helps in detection of cases with tubal pathology, mild endometriosis and pelvic adhesions whereas transvaginal sonography and clinical features can identify cases of endometriomas and polycystic ovarian disease.

Freidman et al (1985) showed pelvic sonography has no role in detection of minimal or mild endometriosis. Mais et al (1993) reported an efficiency of transvaginal ultrasonography in screening endometriomas of 97%, compared to the 80% reported in earlier studies, where transabdominal ultrasonography had been used (Cochrane and Thomas 1974). Ubaldi et al (1998) demonstrated that transvaginal sonography has sensitivity of 86.2% in detecting pelvic pathology mainly endometriomas and specificity of 98.6%. Laparoscopy and dye insufflation with or without hysteroscopy is recommended by the Royal College of Obstetricians and Gynaecologists as the tubal patency investigation of choice for infertility (Fertility Committee of RCOG 1992).

The cost and associated surgical morbidity have traditionally been justified because Laparoscopy, unlike hysterosalpingography, allows pelvic diseases such as endometriosis and adhesions to be detected besides enabling the assessment of fallopian tube patency.

#### Conclusion:

The present study suggests, that clinical examination and transvaginal sonography have a low sensitivity, but a high specificity, proving that their ability to predict normal pelvic findings is low, but can accurately predict abnormal pelvic pathology, in 95.9% and 97.4% of patients respectively. This shows, when women have positive symptoms and signs or positive transvaginal sonography findings, Laparoscopy is mandatory in such cases and should be deferred in others, and may be done when conservative line of treatment fails.

In a short term infertile woman, laparoscopy is optional, may be deferred till conservative line has been tried and failed, and when there are no positive clinical and transvaginal sonography findings. A hysterosalpingogram can be done for tubal patency in patients with short term infertility.

In patients with long term infertility, Laparoscopy is imperative in diagnosis as well as treatment of pelvic pathologies.

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