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Role of Diagnostic Laparoscopy in the Evaluation of Pelvic Adnexal Masses

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Abstract:

PURPOSE- To evaluate the causative etiology of pelvic adnexal masses by laparoscopy and to study correlation of findings on clinical examination with that of ultrasound and compare it with findings of diagnostic laparoscopy in patients with pelvic adnexal masses.

METHODOLOGY- The present study was conducted in department of Obstetrics and Gynaecology in Kasturba Hospital, Delhi over a period of 2 years (2012-2014). 50 patients with any gynaecological complaint and with suspected pelvic adnexal mass (group 1) and 50 asymptomatic patients with normal pelvic examination (Group 2) coming for laparoscopic sterilization were taken up for the study. Pelvic examination, ultrasonography and laparoscopy were done in all patients.

RESULTS: On diagnostic laparoscopy, 48(96%) patients had abnormal findings. In group 1, majority of adnexal masses 14 cases (28%) were found to be ovarian cyst. Polycystic ovaries were found in 10 (20%) cases. Endometriotic cyst was detected in 7 cases. Chronic pelvic inflammatory disease (6 cases of tuboovarian mass and 5 cases of hydrosalpinx) was found in 11 cases (22%). No abnormality was found in 2 (4%) cases. 23(46%) cases had adnexal mass on clinical examination and 36 (72%) had positive USG findings in group1. All the cases which had normal laparoscopic findings were also found to have normal clinical and ultrasound findings. In group 2 all 50 patients had normal clinical and ultrasound examination, but only 5(10%) cases had abnormal findings on laparoscopy). The sensitivity of pelvic examination, diagnose the pelvic adnexal mass was 43.34% and that of ultrasonography was 67.9%.

CONCLUSION: Laparoscopy triumphs in detecting many pelvic adnexal masses which clinical methods and USG sometimes fail to identify. This enforces position of laparoscopy as a gold standard for the evaluation of patients with pelvic adnexal masses.

Keywords: Pelvic adnexal mass, laparoscopy, ultrasonography, clinical examination

1. Introduction

In the female reproductive tract the differential diagnosis of pelvic mass is quite variable. Gynaecological masses can either arise from uterus or from the adnexa of uterus i.e. ovaries, fallopian tubes, uterine ligaments and associated blood and nerve supply¹. While non gynaecological sources of pelvic masses are those arising from bladder, ureter, rectum, colon, blood vessels and nerves in the pelvis². The broad differential diagnosis of an adnexal mass includes lesions of infectious origin, such as a hydrosalpinx or tubo-ovarian mass, physiologic or functional cysts, endometriomas, both benign and malignant neoplasms, and masses originating in organs or tissues proximal to the adnexa³. Gynaecologists are often confronted with the dilemma of differentiating malignant tumours from benign in patients presenting with a pelvic mass².

Evaluation of the adnexa is an integral part of the gynaecological examination and pelvic examination serves as a primary screening method for asymptomatic adnexal disease. An accurate adnexal assessment is even more important in postmenopausal women because of higher incidence of ovarian cancer, often with no early signs and symptoms. The standard evaluation of adnexal masses includes history, physical examination, ultrasound evaluation, tumours markers and final confirmation after biopsy². Often the clinical history and examination are not conclusive for exact diagnosis of the pelvic adnexal masses. Hence the final diagnosis is made on diagnostic laparoscopy. Since the late 1960s laparoscopy, has been used as both a diagnostic and therapeutic modality in patients with pelvic adnexal masses. The advantage of laparoscopy is that simultaneous treatment of evident cause can be undertaken at the same sitting.

Our study aims to analyse the various causes of pelvic adnexal masses in women of reproductive age group and to establish the place of diagnostic laparoscopy in evaluating the pelvic adnexal mass. It also aims to compare the efficacy of clinical examination and abdomino-pelvic ultrasonography in evaluating the pelvic adnexal masses.

2. Materials and Methods

This was a detailed prospective study conducted at Kasturba hospital, Delhi on one hundred women attending the Gynae OPD and family planning department over the period of 2 years (2012 -2014) after taking clearance from the Ethical committee of the institution. 50 subjects between 18-50 years were included in the study with any gynaecological complaint and with suspected pelvic adnexal mass (group 1) and 50 asymptomatic patients with normal pelvic examination (Group 2) coming for laparoscopic sterilization. Pregnant women, patients with active genital infection, cardiac or pulmonary disease, coagulopathy, multiple abdominal surgeries were excluded from the study group. In all cases, a detailed history was taken and a general physical examination and systemic examination including per abdominal examination was done. Per Speculum Examination was done to rule out cervical and vaginal pathology such as infection, erosion, polyp, abnormal growth, discharge and bleeding. Bimanual pelvic examination was done for assessment of uterine size in weeks, size of mass in cm, characteristics of the mass such as surface, mobility and consistency. Thickening, tenderness and fullness in pouch of douglas was also noted. Per Rectal examination was performed where indicated. Routine blood investigation, x-ray and ECG were done. Ultrasound was performed in Radiology Department of Kasturba Hospital using Toshiba 3.5-5 MHz. Entire pelvis and lower abdomen in both transverse and longitudinal planes was scanned. Diagnostic Laparoscopy was performed under general anaesthesia after written informed consent in the postmenstrual phase with a 5 mm karl storz 30° angle laparoscope was used. Pneumo-peritoneum created with carbon-dioxide with a 15-gauge verses needle. Second puncture was established in every case lateral to the rectus muscle to improve visualization and careful evaluation of entire pelvic peritoneum along with manipulation of pelvic organs. A third port was established similarly on other side whenever an operative procedure was undertaken. Adhesiolysis, fulguration of endometriotic lesions, excision of cyst wall was done during the same sitting after obtaining informed consent. The findings of clinical examination and ultrasonography were finally compared with those on diagnostic laparoscopy. The data was statistically analysed using the Yates chi-square test to calculate the p values for the associations between the variables studied and to compare the sensitivity, specificity and predictive value of clinical examination, ultrasound and laparoscopic evaluation.

3. Results

The study included 100 patients and the mean age of patients in group 1 was 32.04 years and in group 2 was 34.64 years Maximum number of patients (36%) in Group 1 were nulliparous whereas in Group 2 majority 50% patients were para 3. In the study group, 68% patients had normal blood flow during their menstrual cycles. 24% cases complained of either oligomenorrhoea or hypomenorrhoea during menses while only 8% of cases had menorrhagia. In group 2 all of the patients had normal blood flow during their menstrual cycle. 64% in group 1 and 84% in group 2 were not using any method of contraception. The primary complaints in the study group were dysmenorrhoea in 54% followed by inability to conceive in 42%. 36% women complained of dyspareunia. 32 percent of the subjects were also distressed due to abnormal uterine bleeding along with pelvic pain. 18 percent of the patient reported presence of discharge per vaginum and only 4% presented with lump in abdomen.

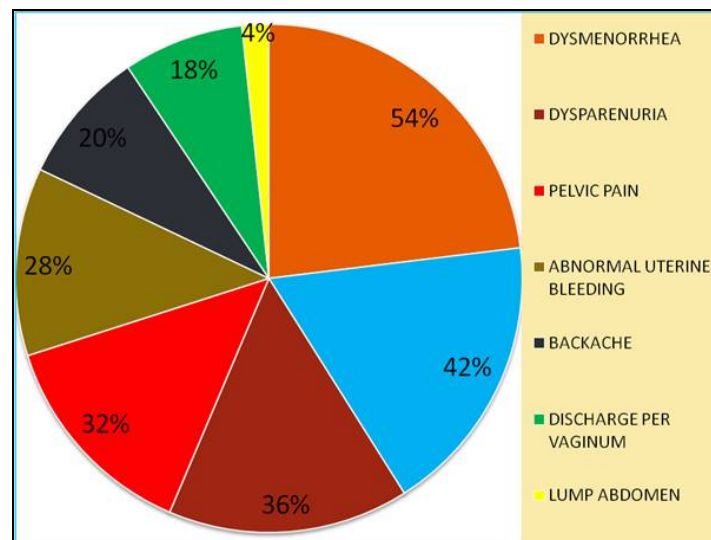


Figure 1: Presenting Symptoms in Group 1

On clinical examination, mass in fornices and Pouch of douglas (POD) was found in 23 cases (46%). Restricted mobility of uterus was seen in 18 (36%) cases and thickening in the fornices in 17 (34%) cases. Tenderness in fornices was elicited in 14 (28%) cases and cul de sac nodularity in 4 cases (8%). Uterus was enlarged in 1 case (2%). 27 cases (54%) had no palpable mass on bimanual pelvic examination. The sensitivity of pelvic examination to diagnose pelvic adnexal mass was 43.34%.

Clinical Findings	Abnormality	No. Of Patients
Uterus	Enlarged	1(2%)
	Restricted Uterine Mobility	18(36%)
Fornices	Thickened	17 (34%)
	Tender	14(28%)
	Mass	20(40%)
Pod	Mass	3(6%)
Cul De Sac	Nodularity	4 (8%)

Table 1: Clinical finding in group 1 patients

Ultrasonography was abnormal in 36 cases (72%) and normal in 14 (28%) of the cases. The commonest finding being ovarian cysts in 26% of the cases followed by polycystic ovaries in 18% cases and endometriotic cyst in 12% cases. Tuboovarian mass was found in 4 cases (8%) and hydrosalpinx in 3 cases (6%).

Findings	Abnormality	No. of Patients
Uterus	Enlarged	1(2%)
Ovaries	Ovarian Cyst	13(26%)
	Polycystic Ovary	9(18%)
	Endometriotic Cyst	6(12%)
	Tubo-Ovarian Mass	4(8%)
Pod	Free Fluid	8(16%)
Tubes	Hydrosalpinx	3(6%)
Broadligament	Cyst	1(2%)

Table 2: Ultrasonography findings in group 1 patients

On statistical analysis sensitivity of ultrasonography in diagnosing adnexal mass was found to be 67.9% and negative predictive value was 73.4%. It was observed that out of the 48 patients with abnormal laparoscopy, Pelvic adnexal mass was detected on ultrasonography in 36 patients in group 1. No abnormalities were found on ultrasonography in 12 cases in group 1. In the control group no adnexal mass was diagnosed on ultrasonography where as on laparoscopy 5 adnexal masses were detected out of 50 patients and rest 45 patients did not reveal any abnormality, thereby demonstrating a positive predictive value of 100%. All patients showing findings on ultrasound were positive on laparoscopy.

Structure	Abnormality	Group-1 (N=50)		Group-2 (N=50)	
		No.	%	No.	%
Uterus	Tubercles	3	6	0	0
	Enlarged	1	2	0	0
	Endometriotic Implants	2	4	0	0
Tubes	Hydrosalpinx	5	10	0	0
	Tortuous	3	6	0	0
	Inflamed	5	10	1	2
	Dilated	6	12	0	0
	Beaded	2	4	0	0
	Agglutn.Of Fimbriae	4	8	0	0
	Peritubal Adhesion	9	18	4	8
	Ovarian Cyst	14	28	3	6
Ovary	Endometriotic Cyst	7	14	1	2
	Tuboovarian Mass	6	12	1	2
	Polycystic Ovary	10	20	0	0
	Periovarian Adhesions	6	12	2	4
	Pod	Adhesions	4	8	2
Pod	Endometriotic Nodules	4	8	0	0
	Omentum	Adhesions	5	10	4
Br.Ligament	Cyst	2	4	0	0
Add. Findings	Frozen Pelvis	2	4	0	0
	Free Fluid In Pod	11	22	0	0

Table 3: Findings of diagnostic laparoscopy in group 1 and group 2

Diagnosis	Laparoscopy Findings	Usg Findings	Clinical Findings
	No.	No.	No.
Normal	2	14	27
Ovarian Cyst	14	13	10
Polycystic Ovary	10	9	0
Endometriotic Cyst	7	6	4
Tuboovarian Mass	6	4	3
Hydrosalpinx	5	3	2
Broad Ligament Cyst	2	1	1
Endometriotic Nodule Pod	4	0	3

Table 4: Comparison of clinical examination, ultrasonography and diagnostic laparoscopy findings

Of the total of 48 cases (96%) in whom diagnostic laparoscopy revealed pelvic adnexal mass, only 23 cases (46%) were suspected on clinical examination and 36 cases (72%) were detected on USG. The most common finding was ovarian cyst by clinical examination, on USG and also on diagnostic laparoscopy. None of the cases of polycystic ovary was diagnosed by clinical examination while ultrasound detected 9 cases and on laparoscopy 10 cases of polycystic ovary were found. In group 1, of the 7 cases of endometriotic cyst confirmed on laparoscopy, 4 cases were suspected on bimanual pelvic examination in the form of thickening and palpable mass in fornices and POD. 6 cases were detected on ultrasonography by the presence of anechoic/hypoechoic cysts. Chronic PID was seen in the form of tuboovarian mass and hydrosalpinx on laparoscopy. Tuboovarian mass were present in 6 cases on laparoscopy, detected in 4 cases on ultrasound and suspected in 3 cases by clinical examination. 2 cases of hydrosalpinx were detected by clinical examination, 3 cases by ultrasound and laparoscopy detected 5 cases of hydrosalpinx. Laparoscopy detected broad ligament cysts in 2 cases, while both by ultrasound and clinical examination only 1 case of the broad ligament cyst was suspected. No endometriotic nodule was seen by USG while on clinical examination, it was suspected in 3 cases and laparoscopy confirmed 4 cases of endometriotic nodule in Pouch of Douglas.

4. Discussion

Accuracy of clinical examination is limited by the presence of objective physical signs and symptom. In our study, the sensitivity of clinical examination in diagnosing the pelvic adnexal mass was found to be 43.34% and specificity was 100%. The positive predictive value was 100% and negative predictive value was 61%. The correlation between clinical examination findings and laparoscopic findings was not found to be statistically significant, applying the chi square test ($p > 0.05$). Gourisankar's study in 2005 in a similar study also showed poor correlation ($k=0.57$) between pelvic examination findings and laparoscopy⁴. Ultrasonography is a useful noninvasive method of diagnosing adnexal mass. The sensitivity and specificity of ultrasonography for the detection of pelvic adnexal mass was 67.9% and 100%. While positive predictive value and negative predictive value were 100% and 73.4% respectively. Safia Sultana Munir² 2010 in their study evaluated sensitivity of 80%, specificity of 95.9%, predictive value of positive test was 66.6% and of negative test was 97.9% for detection of pelvic adnexal mass. Though there was poor correlation between clinical examination and ultrasonography ($p > 0.05$) but significant association ($p = 0.016$) was seen between ultrasonography and laparoscopy for detection of pelvic adnexal mass. Thus laparoscopy proved to be more sensitive than clinical examination and ultrasonography in the detection of pelvic adnexal masses.

On comparing clinical examination and laparoscopy in diagnosing ovarian cyst the sensitivity of clinical examination was found to be 71.4% and on comparing ultrasonography and laparoscopy the sensitivity of USG was found to be 92.9%. Cunnan et al⁵ in 1983 in their study found the sensitivity of clinical examination to be 54%. Stefano Guerriero et al in 2009 in their study showed the sensitivity of transvaginal ultrasonography in differentiating serous cyst from other masses was 78%–86%, with a specificity of 96% which is comparable to our study⁶.

On comparing diagnosis of tuboovarian mass strong agreement is found between laparoscopy and ultrasonography ($kappa$ value = 0.77), and moderate agreement ($k=0.63$) was found between clinical examination with laparoscopy. This proves that laparoscopy is a better diagnostic tool than both clinical examination and ultrasonography for the diagnosis of tuboovarian mass. For the diagnosis of hydrosalpinx there was strong agreement between laparoscopy and ultrasonography ($kappa$ value = 0.72), and moderate agreement ($k=0.54$) between clinical examination with laparoscopy. Thus proving that laparoscopy is a better diagnostic tool than clinical examination and ultrasonography for diagnosis of hydrosalpinx. The sensitivity of clinical examination for diagnosing endometriomas was found to be 57.14% and of USG was found to be 85.7%. Stefano Guerriero et al in 2009 showed the sensitivity of transvaginal ultrasonography in differentiating endometriomas from other masses was 81%–89%, with a specificity of 91%–98% similar to our study⁷. Polycystic ovary was not diagnosed on clinical examination and ultrasonography and laparoscopy were comparable in diagnosing PCOD on laparoscopy.

The limitation of the study was that the diagnostic modalities used to evaluate patients with pelvic adnexal mass were clinical examination, ultrasonography & laparoscopy. However, the exact aetiopathogenesis of the disease causing pelvic adnexal mass can be determined by histopathology only. Also due to unavailability of imaging modalities like CT, MRI these could not be used to evaluate

pelvic adnexal masses in our study. It is also not possible to comment upon the causes of pelvic adnexal masses in patients less than 18 years and more than 50 years from this study.

5. Conclusion

Accuracy of clinical examination is limited by the presence of objective physical signs and symptom. Ultrasonography can be of promising value in evaluation of pelvic adnexal masses but also needs training and experience for the techniques to increase sensitivity. Thus laparoscopy is more sensitive than clinical examination and ultrasonography for detection of adnexal masses. It also establishes a definitive diagnosis and treatment to be done in the same sitting and therefore it can be recommended as the best diagnostic modality for the evaluation of patients with pelvic adnexal masses.

Conflict of interest –The authors declare no conflict of interest.

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