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THE EVALUATION OF PELVIC MASS

SAFIA SULTANA MUNIR, MISBAH SULTANA AND DAWOOD AMIN
Departments of Obstetrics and Gynaecology & Histopathology, Shalamar Hospital, Lahore

ABSTRACT

Introduction: *In female reproductive tract the differential diagnosis of pelvic mass is quite variable because abnormality may arise from gynaecological or non gynaecological origin. The present study was designed to evaluate the efficacy of clinical examination and abdomino-pelvic ultrasonography and find out the frequency of malignancy in patients diagnosed with pelvic mass. It was a cross sectional prospective study of one year duration.* ***Materials and Methods:*** *Cohort study design on 107 patients with complaints suggestive of pelvic mass underwent clinical examination including history, abdomino-pelvic examination followed by abdominal ultrasound were evaluated. Only the patients who underwent laparoscopy or laparotomy were included in the study. Final diagnosis was correlated with histopathological diagnosis.* ***Results:*** *Overall sensitivity of clinical evaluation was 50% while ultrasound was 80% sensitive in diagnosing the type of pelvic mass. Positive predictive value of clinical examination 71.4% was higher than ultrasound 66.6%. Frequency of gynaecological malignancy was 84%, while 1.9% malignancies were of non gynaecological origin.* ***Conclusion:*** *Our study has supported the view that clinical evaluation and ultrasound are initial modalities and to increase the sensitivity for definitive diagnosis other imaging facilities and tumor marker are needed.*

Keywords: *Pelvic mass, Clinical Evaluation, USG.*

INTRODUCTION

Gynaecologist are often confronted with the dilemma of differentiating malignant tumours from benign in patients presenting with pelvic mass or presumptive diagnosis of liomyomata.

In female reproductive tract the differential diagnosis of pelvic mass is quite variable because abnormality may arise from gynaecological or non gynaecological origin. Gynaecological masses are either uterine or adnexal. Adnexal region is composed of ovary, fallopian tube, broad ligament, and associated blood and nerve supply. While non gynaecological sources of pelvic masses are those arising from bladder, ureter, rectum, colon, blood vessels and nerves in the pelvis.

When evaluating pelvic mass, gynaecologist should consider an ovarian aetiology. Indeed ovarian pathology is responsible for 70% of pelvic masses found at exploratory surgery on patients with pre-operative diagnosis of pelvic mass, not attributable to liomyomata. As half of all ovarian tumours occur in women under 40, only 18% of malignant tumours are found in this age group thus 80% of malignant ovarians tumors are found in women over the age of 40.[1]

The standard evaluation of adnexal masses includes history, physical examination, ultrasound evaluation and tumours markers and final confirmation after biopsy. Other imaging techniques used are computerised tomography and magnetic resonance imaging. Final diagnosis is reached at laparoscopy or laparotomy. If the clinician could accurately differentiate a malignant from a benign mass, patients with masses believed to be malignant could seek proper oncologist consultation preoperatively. At the time of operation, appropriate incision would allow careful staging. The preoperative diagnosis of ovarian cancer might reduce the need for repeat laparotomies and could lead to timely referral to gynaecological oncologists.[2]

Although a few data are available regarding the accuracy of physical examination to differentiate benign from malignant mass, its positive predictive value 0.43 however, improves for postmenopausal patients.[2] It acts as an important adjunct of imaging and laboratory tests. Ultrasound is a standard diagnostic test for evaluating the pelvic mass. It is non-invasive, inexpensive, easily available and free of ionizing radiation. Whether ultrasound can differentiate between benign and malignant pelvic masses it has been the subject of many studies. The principle of ultrasound involves confirming the masses, differentiating ovarian masses from tubal or uterine origin, delineating the internal appearance of masses and defining other abnormal findings. It is possible to suspect malignancy on the

basis of ultrasound image.[3] but definite diagnosis cannot always be made.[4] It has high specificity 97.7% and positive predictive value of 1.5% only.[5]

Tumour marker CA-125 has been tested for its ability to distinguish malignant from benign pelvic masses. A rise in serum CA-125 level often precedes clinical symptoms or imaging detection of recurrent disease by 3-6 months.[6] While a single value of CA-125 lacks the specificity and sensitivity required for early detection, greater specificity has been attained by measuring CA-125 overtime and by combining CA-125 with ultrasonography.[7]

Recently use of transvaginal ultrasound especially in post menopausal women for evaluating the endometrial thickness, ovarian morphology and use of colour coded doppler has further improved the results.

The aim of the present study was to determine the frequency of malignancy in patients presenting with pelvic mass during the period of one year, and to compare the sensitivity, specificity and predictive value of clinical examination and ultrasound evaluation and compare it with final surgicopathological diagnosis.

SUBJECT AND METHODS

It was a cross sectional prospective study spanning from November, 2001 till November, 2002. Study included all consective patients admitted to the gynaecological department with to the diagnosis of pelvic mass. Only those patients were included who underwent laparotomy or diagnostic laparoscopy to confirm the diagnosis of pelvic mass.

Pregnant patients and those in whom no diagnostic procedure was performed, were excluded from the study. Information collected about each patient included age, menstrual status, as well as the most common symptoms, such as abdominal or pelvic pain, abdominal distention, dyspepsia, abnor-mal uterine bleeding, self diagnosed tumours or no symptoms were recorded.

The physical examination included general physical, abdominal and bimanual pelvic examination. Rectal examination was performed where indicated. Bimanual pelvic examination included assessment of uterine size in weeks, size of mass in cm, and the characteristics of the mass such as surface, mobility and consistency. Adnexal fullness and tenderness was noted, presence of ascities elicited by fluid thrill, shifting dullness was also noticed. Evidence of pleural effusion was ruled out as well as any evidence of organomegally. On clinical impression a smooth surfaced, mobile and cystic mass was designated as benign, while irregular nodular, solid and fixed masses with evidence of ascites, palpable omental tumour and bilaterality were suspected as malignant.

Ultrasound was performed in radiology department of Shalamar Hospital Lahore by consultant radiologist using Toshiba (Capasi) 3.5-5 MHz with full bladder technique, entire pelvis and lower abdomen in both transverse and longitudinal planes were scanned. KUB, liver and spleen were assessed where indicated. Ultrasound criteria for delineating the benign from malignant mass were followed as outlined (Wilson 1995)[4]. Benign tumours usually have sharp, well defined margins and are more likely to be anechoic, while mass with thick septa, irregular solid parts with indefinite margins as well as presence of ascites and matted bowel loops are regarded as malignant pattern. Only ultrasound reports performed within last eight weeks before operation was consider valid. Plan of surgery was according to provisional diagnosis made on clinical examination and ultrasound evaluation. Laparoscopy was performed in patients whom differentiation between ovarian, adnexal conglomerate tumors and liomyomata was difficult after ruling out peritonitis, diaphragmatic hernia or large tumours.

Where malignancy was suspected, proper bowel preparation and backup of surgeon was confirmed. Abdomen opened by midline incision. Staging of malignancy was done, bebulking laparotomy performed and peritoneal washings, omental biopsy and lymph node sampling was done where required and were sent to histopathology and Cytology department.

The sensitivity and specificity of clinical impression, initial ultrasound interpretation and predictive value of positive and negative tests were compared with final surgicopathological diagnosis.

RESULTS

A total of 107 patients fulfilled the inclusion criteria and were admitted with presumptive diagnosis of pelvic mass during one year period. Age ranged between 18-65 years. Thirteen patients were excluded as they did not undergo laparoscopy or laparotomy for definitive diagnosis.

Total gynaecological admission	745
Patients underwent laparotomy	340
Patients underwent laparoscopy	74
Patients diagnosed with pelvic mass	120
Patients included in the study	107
Patients excluded from the study	13
Patients who underwent laparotomy for pelvic mass	88
Patient who underwent laparoscopy for pelvic mass	19
Overall incidence of gynaecological malignancy	7.5%
Overall incidence of non gynaecological malignancy	1.9%

This total included 4 patients with the diagnosis of functional ovarian cyst who were advised hormonal suppression or conservative management Four patients were diagnosed with fibroid uterus less than 12 wks size with no associated symptoms, they were also advised conservative follow up. Two postmenopausal ladies with the diagnosis of adnexal masses were advised surgery as the mass was 5cm with ultrasound features of malignancy, they refused surgery and were lost to follow up. One patient with recurrent ovarian carcinoma was shifted to oncology unit for extensive abdominoperineal resection. Two patients with suspicious masses were found unfit for surgery and were, referred for further investigation and possible chemotherapy.

A total of 74 diagnostic laparoscopies were performed. Among these 19 were those who were diagnosed as having undefined adnexal masses with or without pain and abnormal vaginal bleeding. Among these endometriosis was present in 8, inflammatory masses in 5, chronic ectopic pregnancy in 2 and pedunculated fibroid in 2 patients.

The most common symptom was pain or abdomino pelvic discomfort which were present in 68 (63.6%) cases. Whereas 25 (4%) patients presented with self diagnosed tumour. Dyspepsia was prevelant in 11 (0.9%) and feeling of abdominal distention in 8 (3.71%). In 26 (24.3%) abnormal vaginal bleeding was also present. Clinically evident ascites was present in 7 (6.5%) cases. None of patients had pleural effusion. Ninety five patients had benign gynaecological disease, while two patients had non gynaecological benign disease (appendicular abscess and retroperitoneal cyst) (Table 1).

Table 1: *Symptoms & Signs.*

Symptoms & Signs	No. of Patients	%
Presenting symptoms:		
1.Abdominal/Pelvic discomfort	68	63.6
2.Abdominal Distention	8	3.7
3.Self diagnosed tumors	55	51.4
4.Asymptomatic	25	4%
5.Dyspepsia	11	0.9
6.Abnormal uterine bleeding	26	24.3
Presenting signs:		
1.Discrete pelvic mass	105	98.1
2.Adenexal fullness	5	4.7
3.Clinically evident ascities	7	6.5
4.Tenderness	7	6.5
5.Pleural effusion	0	0
6.Plapable omental tumor	0	0

On clinical examination major diagnosis among benign tumours was liomyomata (46.71%) followed by benign ovarian cyst (34.6%). Five were diagnosed as endometriosis and 6 patients had adnexal masses. The clinical examination could accurately diagnose fibroid uterus and benign ovarian cyst. Its results were poor in patients with the diagnosis of sub-acute / chronic ectopic pregnancy as compared to ultrasound. On the other hand in case of endometriosis ultrasound showed high false negative results (n =

Table 2: *Comparison of Preoperative and sirgicopathologic Diagnosis n=107.*

Clinical diagnosis	USG Diagnosis	Sirgicopathologic diagnosis
98	95	97
98	95	95
50 (46.71%)	46 (43%)	40 (37.4%)
37 (34.6%)	40 (37.4%)	28 (26.2%)
6 (5.6%)	3 (2.8%)	5 (4.7%)
Ectopic pregnancy	0	5 (4.7%)	7 (6.5%)
Endometriosis / Chocolate cyst	5 (4.7%)	1 (0.9%)	15 (14%)
Benign non gynaecological disease	0	0	2 (1.9%)
Malignant Tumors	7	12	10*
Gynaecological malignancy	7 (6.5%)	12 (11.12%)	9* (8.4%)
Non gynaecological malignancy	0	0	2* (1.9%)
Not Diagnosed	2	0	0

* = One tumor was with primary focus in colon and secondary in ovary.

14) as compare to clinical examination.

Among 107 patients examined surgically, 10% were diagnosed as malignancy. Seven (6.5%) had ovarian malignancy with predominance of serous cystadenocarcinoma (n = 4). Rest were endodermal sinus tumours (n = 1) mucinous cystadenocarcinoma (n = 1) and endometriod carcinoma (n = 1). One of these was metastatic carcinoma ovary, and primary focus was present on transverse colon.

One patient who was diagnosed as benign ovarian cysts on ultrasound was discovered to have carcinoma of colon & metastatic omental tumour.

False positive sonographic diagnosis of malignancy included pedunculated liomyomata (n = 1), endometrial chocolate cyst (n = 1) and serous cystadenocarcinoma (n = 1).

Table 3: *Accuracy of Invasive and Non Invasive Diagnostic Methods.*

	Sensitivity	**Specificity**	**Predictive value of +ve test**	**Predictive value of −ve test**
Clinical diagnosis	50%	97%	71.4%	95%
USG diagnosis	80%	95.9%	66.6%	97.9%
Laparoscopy / Laparotomy	100%	100%	100%	100%

The overall sensitivity and specificity of each diagnostic parameter are shown in table 3. Clinical examination had sensitivity of 50% and specificity of 97.9%. Predictive value of positive test was 71.4% and predictive value of negative test was 95.1%. Ultrasound evaluation depicted the sensitivity of 80% and specificity of 95.9%. Predictive value of positive test was 66.6% and of negative test was 97.9% which the surgicopathological diagnosis had 100% sensitivity and specificity and positive and negative predictive value.

DISCUSSION

The accuracy of diagnostic tests used to evaluate the pelvic mass is of great concern to practising gynaecologist. In pre-operative evaluation of such a mass, the major initial tests are still clinical impression and ultrasound examination.

Hence it is important to obtain a thorough history from patient when developing a comprehensive differential diagnosis. In many patients symptoms can help to delineate the aetiology of the mass.[8] Pain was the predominant feature in 68 (63.5%) patients followed by abnormal uterine bleeding in 26 (24.3%). Among them 97% masses were benign, with predominance of fibroid uterus. Pain may be explained due to degeneration of fibroids or any acute accident of benign ovarian cyst such as haemorrhage or torsion. Patients with submucous fibroid and adenocarcinoma may present with abnormal uterine bleeding. In a study by Lin et al,[9] most common symptom of ovarian malignancy was pain in abdomen or pelvis followed by abdominal distention.

This study shows that 29 (27.1%) patients presented with vague symptoms of gastrointestinal tra-

ct (GIT) feeling of abnormal distention 8 (7.5%) and flatulus/dyspepsia 11 (10.3%). Patients with the diagnosis of ovarian malignancy can have wide spread disease at the time of laparotomy because of repeated lack of specific early symptoms, feeling of abdominal distention, discomfort and flatulence are usually managed as GIT disorders Barbar (1982)[10] very concisely stated that "many ovarian cancers are nurtured in a sea of bicarbonate of soda and antacids". Aslam[11] concluded the same observation in a study on mode of clinical presentation of ovarian neoplasm. Clinical impression including history and abdominopelvic examination showed 50% sensitivity and with positive predictive value of 71.4%.

Comparison of Accuracy of USG Examination of Different Studies

Authors	Sensitivity	Specificity	Predictive value of positive test
Lin et al (1993)	83	50	58
Finkler et al (1988)	50*	96*	43*
	78**	93**	76.7**
Herrmann (1987)	82.6		73
Present Study	75	95	60

*Premenopausal
**Postmenopausal

Similar results were obtained by other workers (Flinker et al)[2] although they categorised his patient in pre and postmenopaus. In postmenopausal patients sensitivity of 68% and positive predictive value of 67% were present. Aslam[11] stated that physicians need to have a high index of suspicion in women with vague pelvic or abdominal symptoms. Routine pelvic examination even in asymptomatic women is mandatory at the time of general physical examination.

In this study predictive value of negative test was 97.5% and specificity was 95%. Other studies have also shown the high rate of specificity and predictability for detecting benign gynaecological diseases. The sensitivity in this study was 75% and predictive

value of positive test was 60% for detecting malignancy. Several retrospective studies highlighted in the following table claimed that sonography permits differentiation between benign and malignant lesions in 87-91% of examined patients.

Differences in these studies are seen because of different inclusion criterion. Lin et al[7] studied selected patients with selected gynaecological malignancy. In addition to that Finkler[2] studied only those patients who presented with adnexal mass and did not include uterine masses as in our study. Finkler[2] et al divided his patients into two separate groups, premenopausal and postmenopausal. He used review USG, using 10 point scoring method to predict malignancy which improved his results. While Herrmann et al[12] improved their results by briefing radiologists about thorough clinical evaluation of patients.

The results of different studies including the present show that although sonography can not predict malignancy in every case, it can indicate a likelihood that a pelvic tumour is malignant. Thus sonography serves as the primary imaging modality in patients with suspected pelvic mass by narrowing the wide differential diagnosis of pelvic tumours. Jacob et al have used the combination of ultrasound CA-125 and menopausal status to create a risk of malignancy index (RMI) achieving a sensitivity of 85% with a specificity of 97% for predicting the presence of ovarian cancers in women with pelvic masses.[13]

The false positive diagnosis was mainly due to a significant overlap in the ultrasonographic characteristics of benign tumours (i.e. pedunculated leiomyomas, endometriotic chocolate cyst, serous and mucinous cystadenoma) and ovarian malignancies. There were two false negative cases in our study. One patient presented with abnormal uterine bleeding and was diagnosed to be case of degenerated fibroid on USG. Carcinoma endometrium was detected on surgicopathological diagnosis. Although thickness of endometrium can be measured ultrasonographically and irregularities, fluid collection within the cavity and endometrial polyps can be seen, biopsy is still essential.[4] The second case was diagnosed as benign ovarian cyst and was found stage II ovarian carcinoma on exploratory laparotomy. Two non gynaecological malignancies detected, were those found in colon. One showed secondaries in omentum and the other had in both ovaries (Krukenberg tumour). Dollar et al[14] have also observed that GIT was the most frequent primary site. Colonic malignancies were undetected on USG and were discovered unexpectedly on laparotomy. The results presented here support the conclusion drawn by Killackey et al[15] that any patient over the age of 40 with pelvic mass should have undergone complete physical examination including breast, rectal with stool haemoccult test and appropriate gastrointestinal and genitourinary radiographic examination. Mechanical bowel preparation is required and patient should be informed of possibility of malignancy. Prior any surgical procedures one must get CA 125 done. The appropriate surgical assistance, general surgeons, or gynaecological oncologists should be consulted before the procedure, a vertical incision used and surgical facilities available to handle any abdominopelvic pathology.

Further more additive CT scan in patients with USG scan report strongly suggesting ovarian carcinoma compliments the scanning report because it can demonstrate involvement of lymph nodes, ascites and bowel involvement[16]. Further evaluation of adenexal mass especially about nature, extent of mass or the presence or absence of blood or fat can be supplemented by MR imaging.[17]

MRI can obviate surgery or significantly contribute to the pre-operative planning of a sonographically indeterminate mass.[18]

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