

Value of Sonography in Evaluation of Gynaecological Pelvic Masses

A. P. Manjunath, M. R. Desai, P. D. Desai, D. A. Modi.

Dept. of Obst. & Gynaec. Medical College & SSG Hospital, Baroda, India.

Summary : A review of 112 cases of pelvic masses were presented. Each case was evaluated clinically, sonographically and histopathologically. Each pelvic mass has a spectrum of sonographic morphology. Fifty % of the masses in present series were complex in morphology. All malignant masses were complex in morphology. Sensitivity, specificity and positive predictive value of determining malignancy in pelvic masses sonographically were 78%, 98% and 70% respectively. Fibroid is the most important and the most common mass encountered in present series (36%). Ovarian tumor is the second most common pelvic mass (34%). When we compare the overall accuracy of clinical and sonographical diagnosis there is hardly any difference (74% v/s 75%). In patients presenting with ovarian tumors sonography offered a definite advantage over clinical examination. In conclusion, routine sonography is not necessary in preoperative evaluation of pelvic mass, unless ovarian tumor is suspected.

Materials & Methods

This is a prospective study carried out in the department of Obstetrics and Gynaecology S.S.G. hospital & medical college, Baroda from April 1994 to Nov.1996.

All patients with provisional clinical diagnosis of pelvic mass admitted in gynaec department were enrolled in the study. Detailed history was elicited, thorough clinical examination was done for preoperative evaluation of the case. All patients were subjected to ultrasonography with full bladder and the mass was evaluated for size, site, organ of origin morphology, involvement of other organs, presence of free fluid and other notable characters. Sonography was done when pelvic mass was suspected irrespective of the mass being palpable per abdomen or not. Once sonography was done the mass was categorized according to Sabhagha 1994. Confirmation of mass was obtained by laparotomy or laparoscopy and evaluated histopathologically.

Introduction

Pelvic mass is one of the most common clinical presentation in gynaecology. The accurate diagnosis of pelvic mass is a challenge to the gynaecologists, before pelvic cavity is explored by laparotomy or laparoscopy, because of its bizarre & atypical behavior.

With the application of ultrasound in obstetrics &

gynaecology, which was first described by Donald et al (1958), there was a revolution in the field of diagnosis and management of pelvic masses.

Ultrasonography is the most widely used noninvasive cost effective & easily available imaging modality in the evaluation of female genital tract. The accuracy of ultrasonography as a diagnostic tool ranges from 80-90% (Sardesai, et al, 1989).

Only knowing the clinical presentation is not enough for management. Sonologic landmarks and pathologic appearance has tremendous implication in therapeutic approach.

The present study aims at knowing the accuracy and limitations of ultrasonography in the diagnosis of pelvic masses.

Analysis and Discussion

In the present series of 112 pelvic masses laparotomy was performed in 106 (94.64%) cases, only diagnostic laparoscopy in 3 (2.68%) and diagnostic laparoscopy followed by laparotomy in 3(2.68%).

Table I shows the proven diagnosis in patients with clinically suspect pelvic masses. Among 112 masses scanned 15 (13.4%) were completely cystic. Ovarian

TABLE : I
SONOGRAPHIC CATEGORIZATION OF PELVIC MASSES (n=112)

CATEGORY	FIBROID	OVARIAN TUMOR	TO MASS	CHOCOLATE CYST	ECTOPIC PREGNANCY	OTHER	TOTAL
1. COMPLETELY CYSTIC	-	12(31.57)	-	1(16.66)	-	2	15(13.39)
2. COMPLEX, PREDOMINANTLY CYSTIC	-	3(7.89)	1(11.11)	1(16.66)	2(22.22)	3	10(8.92)
3. COMPLEX, CYSTIC WITH LAYERING MATERIAL	-	4(10.52)	2(22.22)	2(33.33)	1(11.11)	-	9(8.05)
4. COMPLEX, CYSTIC WITH SEPTAE	-	12(31.52)	3(33.33)	1(16.66)	4(44.44)	4	24(21.42)
5. COMPLEX, PREDOMINANTLY SOLID	-	6(15.78)	3(33.33)	1(16.66)	2(22.22)	1	13(11.60)
6. COMPLETELY SOLID	40(35.7)	1(2.63)	-	-	-	-	41(36.60)
TOTAL	40	38	9	6	9	10	112

masses constitute the major bulk (12 cases). One each of chocolate cyst, hydrosalpinx and encysted tuberculous abdomen presented as completely cystic mass on sonography. In comparison Thomas et al. (1977) noted 67 cystic pelvic masses, among them functional ovarian cysts constitute 49, abscesses 10, ectopic pregnancy 4, endometrioid cyst 1 and hydrosalpinx -2.

It is clear from Table I that 50% masses were complex in morphology. Ovarian tumors were the most common

which 22 were uterine and 18 extrauterine

As shown in Table II the overall sensitivity, specificity and positive predictive value for determining malignancy of pelvic masses in sonography was 77.77, 98.09 and 77.77 respectively. In our series of 112 pelvic masses malignancy was encountered in 9 cases. All were ovarian malignancies.

With sonographical complex morphology in conjunction with knowledge of the clinical history and physical finding, the correct preoperative diagnosis was made in 7 (77.77%) cases. False negative sonographic diagnosis of malignancy includes mucous cystadenoma (n=1) tuboovarian abscess, (n=1).

Table III clearly highlights that all malignant masses are complex in their morphology. In general more solid and irregular the internal morphology of the tumor more likely it is to be malignant.

TABLE II
ACCURACY OF DETERMINING MALIGNANCY SONOGRAPHICALLY IN COMPARISON WITH HISTOLOGICAL DIAGNOSIS.

VALUES	NO TESTED	PERCENTAGE
SENSITIVITY	7/9	77.77
SPECIFICITY	103/105	98.09
PPV	7/9	77.77
PPV = Positive Predictive Value		

25(22.32%). Tuboovarian mass and ectopic pregnancy presented as complex mass in 9(8.03%) cases each and chocolate cyst in 5 cases.

Solid pelvic masses constitute 41 cases out of which 40 were uterine i.e. fibroid and one extrauterine i.e. dermoid. Thomas et al. in 1977 in a series of 251 proven cases of gynaecological masses noted 40 solid pelvic masses of

TABLE III
MALIGNANCY RELATED TO SONOGRAPHIC MORPHOLOGY (n=9)

Morphology	No of Cases	Percentage
Complex cyst	9	100
Solid Mass	0	0
Simple	0	0

TABLE IV
ACCURACY OF CLINICAL AND SONOGRAPHIC DIAGNOSIS

Diagnosis	Clinical		Sonographic	
	CORRECT No (%)	WRONG No (%)	CORRECT No (%)	WRONG No (%)
Fibroid (40)	37(92.7)	3(7.5)	38(95)	2(5)
Ovarian Tumour (38)	34(89.47)	4(10.52)	37(97.36)	1(2.63)
To Mass(9)	5(55.55)	4(44.44)	4(44.44)	5(55.55)
Ectopic Pregnancy(9)	6(66.66)	3(33.33)	5(55.55)	4(44.44)
Chocolate Cyst(6)	1(16.66)	5(83.33)	0	6(100)
Tuberculosis of Abdomen(5)	0	5(100)		05(100)
Parovarian Cyst (2)	0	2(100)		02(100)
Hydrosalpinx(2)	0	2(100)	0	2(100)
Corpus Luteal Cyst(2)	0	1(100)	0	1(100)
TOTAL	83(74.10)	29(25.89)	84(75)	28(25)

TABLE : V
OVARIAN TUMORS (n=38)

Values	Ultrasound Diagnosis		Clinical Diagnosis	
	No Tested	percentage	No Tested	Percentage
Sensitivity	37/38	97.36	34/38	89.47
Specificity	34/48	70.83	34/50	68.0
Positive Predictive Value	37/32	72.54	34/50	68.0

Further categorizing the complex masses, 4 cases were complex with predominantly solid pattern serous cystadenoma(n=2), dysgerminoma (n=1), primary nonHodgkin's lymphoma of ovary (n=1).

Three cases belong to complex, cystic with internal septations [Krukenberg's tumor (n=2), serous cystadenocarcinoma (n=1)].

One case belonged to the category of complex with predominantly cystic areas [Germ cell tumor (n=1)].

Table IV shows the accuracy of the clinical and sonographic diagnosis of pelvic masses when compared with surgical diagnosis.

Fibroids were clinical by diagnosed correctly in 37 (92.5%), and wrongly in 3 (7.5%) cases. Whereas sonographically the fibroid was diagnosed correctly in

38 (95%) and wrongly in 2 (5%) cases. Hence there is hardly any difference in accuracy while diagnosing fibroid either clinically or sonographically. But in contrast to our series Mistry et al in 1989 showed that clinically fibroids were diagnosed correctly in 14 (87.5%) patients and wrongly in 2 (12.5%) patients while ultrasound was totally accurate in diagnosing fibroids.

In the present series ovarian tumors were diagnosed correctly on clinical examination in 34 (89.47%) cases and wrongly in 4 (10.52%) cases while on sonography the accuracy was slightly better i.e. correct in 37 (97.36%) and wrong in one case (2.6%). As shown in Table IV while diagnosing TO mass accuracy was better clinically in comparison with sonography (55.55 v/s 44.44).

Mistry et al in 1989 showed a false positive rate of 14.3% on clinical examination while diagnosing To abscess where as in sonography there is an equal chance of making

TABLE: VI
TO MASS (n=9)

Values	Ultrasound Diagnosis		Clinical Diagnosis	
	No Tested	Percentage	No Tested	Percentage
Sensitivity	4/9	44.44	5/9	55.55
Specificity	63/70	90.00	63/68	92.64
Positive predictive value	4/11	36.36	5/10	50.00

TABLE : VII
ECTOPIC PREGNANCY (n-9)

Values	Ultrasound Diagnosis		Clinical Diagnosis	
	No Tested	Percentage	No Tested	Percentage
Sensitivity	5/9	55.55	6/9	66.66
Specificity	63/67	94.02	63/66	95.45
Positive predictive value	3/9	55.55	6/9	66.66

TABLE : VIII
FIBROID (n=40)

Values	Ultrasound Diagnosis		Clinical Diagnosis	
	No Tested	Percentage	No Tested	Percentage
Sensitivity	38/40	93.00	37/40	92.00
Specificity	72/72	100.00	72/75	96.00
Positive predictive value	38/38	100.00	37/40	92.50

wrong diagnosis. One report found that transabdominal ultrasound correctly identified TO abscess in 29 of 31 (93.6%) patients with surgically confirmed TO abscesses (Thomas et al 1977).

The present series shows that the accuracy of diagnosing ectopic pregnancy was little better clinically as compared to sonography (66.66% v/s 55.55%)

A single case of chocolate cyst out of 6 could be diagnosed correctly on clinical examination, while on sonography all 6 cases were diagnosed wrongly. Our findings are similar to those of Leslie & Shirley (1991). According to them ultrasound has only a sensitivity of 11% in detecting endometriosis.

In our series 5 cases of encysted tuberculous abdomen, 2 cases of hydrosalpinx, 1 case of ruptured corpus luteal cyst and 2 cases of paraovarian cyst were diagnosed wrongly both clinically as well as ultrasonographically.

In the present series the sensitivity, specificity and positive

predictive value of ultrasonography versus clinical examination was as follows.

Ovarian tumor (n=38)

97.36 v/s 89.47 70.83 v/s 68.0 72.54 v/s 68.00
(Table V)

TO mass (n=9)

44.44v/s 55.55 90.00v/s 92.61 36.36v/s 50.00
(Table VI)

Ectopic pregnancy (n=9)

55.55v/s 66.66 94.02v/s 94.95 55.55v/s 66.66
(Table VII)

In the group which presented with ovarian tumor ultrasonography offered a definite advantage over clinical examination. However sonography did not maintain similar advantage in the other two groups of TO mass

and ectopic pregnancy. In contrast to our study Batra et al 1982 in their study of 90 cases of adenexal masses noted that in ectopic pregnancy sonography offered a definite advantage over clinical examination (Sensitivity 60% v/s 48%, specificity 95.4% v/s 78.1% positive predictive value 83.3% v/s 43.2%).

The sensitivity, specificity and positive predictive value of ultrasonography versus clinical examination was as follows.

Fibroid (n=40)

95.00v/s 92.50 100.00v/s 96.00 100.00v/s 92.50
(Table VIII)

From table VIII it is clear that the ultrasonography has little advantage in diagnosing fibroid over clinical examination.

The overall accuracy of diagnosing the pelvic masses either by clinical or ultrasound by and large remains same. (74% v/s 75%) in our study.

Conclusion

1. Each of the pelvic mass has a spectrum of sonographic appearance. Hence the sonologic evaluation must be done in conjunction with the knowledge of clinical histories and physical findings to give an accurate preoperative diagnosis.
2. The sensitivity of ultrasound for diagnosing malignancy is 78%.

3. The more complex the internal morphology of the mass the more likely it is to be malignant.
4. The patients presenting only with ovarian tumor, sonography offered a definite advantage over clinical examination. The routine sonography in the preoperative evaluation of a pelvic mass can be omitted unless the patients are suspected to have ovarian tumor.

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