

## Correlation of Transvaginal Sonography with Surgical Evaluation in Ovarian Tumours –A Prospective study

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### Summary

The study was undertaken over a period of one year from Dec 98 to Oct. 99 to evaluate the ovarian tumours by transvaginal sonography. A total of 50 cases of clinically suspected ovarian masses admitted in the Gynaecological Ward at PGIMS Rohtak were subjected to transvaginal sonography. Size of the mass, number of cyst compartments, absence or presence of solid parts were looked for in ovarian masses.

Majority of benign tumours were unilocular (40%) and multilocular without solid parts (45.7%) while most of the malignant tumours were multilocular solid (53.3%) and solid (33.3%). Transvaginal Sonography (TVS) had slightly higher accuracy in making diagnosis of benign tumours and slight tendency to overdiagnose malignant tumours. The sensitivity and specificity of TVS in delineating ovarian malignancy was 82% and 92% respectively. TVS was found highly efficient in assessing ovarian tumours.

### Introduction

Ovarian cancer is the second common malignancy of female reproductive system and one of the leading cause of death among gynaecological malignancies (Malik, 1997).

A correct preoperative diagnosis is extremely relevant to preoperative and intraoperative patient management. Bimanual pelvic examination, tumour markers, USG, CT scan, MRI are a few methods for early detection of ovarian cancer.

Sonography is a cheap and non-invasive procedure superior to clinical examination in terms of sensitivity and specificity. Transvaginal Sonography (TVS) is undoubtedly superior to transabdominal sonography (TAS) for detecting early stage ovarian cancer. However some controversies still exist regarding

its use. Thus the present study was undertaken to evaluate the ovarian tumours by TVS.

### Material and Method

This prospective study was conducted on fifty patients of suspected ovarian masses admitted in Gynaecological Ward at PGIMS, Rohtak, over a period of one year from Oct 98 to Oct.99.

The patients with suspected ovarian masses on pelvic examination were subjected to transvaginal sonography which was performed using a probe of frequency ranging from 5-6.4 MHz.

The size of ovarian mass, number of cyst compartments, absence or presence of echogenic reflection patterns in cystic fluid and presence of solid parts were the different features which were looked for

in ovarian masses.

#### Selection criteria for laparotomy following TVS was :-

1. Solid ovarian masses irrespective of size.
2. Cystic ovarian masses >6 cm in diameter in women of reproductive age group.
3. Cystic ovarian masses < 6 cm in diameter in postmenopausal women.

The specimens were subjected to histopathological examination and findings were correlated with TVS findings.

Patients with ovarian masses of < 6 cm in diameter in women of reproductive age group, torsion of ovarian cyst, pregnancy with ovarian cyst and unmarried women were excluded from study.

#### Observations

The age of patients varied between 16 to 65 years, mean age for benign and malignant tumours being 31.3 years and 46.9 years respectively.

Size of the tumour is not an important criteria for suspecting malignancy in a mass (Table I). Diameter of tumour in 2 cases was less than 5 cm. Both were malignant and were missed on pelvic examination.

Majority of malignant tumours (57%) were more than 10 cm in diameter. A good number of benign tumours

(45%) were also more than 10 cm.

On TVS, majority of benign tumours were unilocular (45.7%) without solid parts while most of the malignant tumours were multilocular solid (53.3%) and solid (33.3%) (Table II).

Three benign tumours were misdiagnosed as malignant by TVS.

Clinical diagnosis of benign ovarian cyst without further sub-classification was the closest possible pathological diagnosis which included serous and mucinous cystadenomas and other benign tumours (Table III). Of malignant ovarian tumours, 12 were correctly diagnosed but specific diagnosis was not possible in any case. In all the four cases of dermoid, specific diagnosis was made on TVS.

Three benign solid tumours had appearances similar to solid ovarian mass on TVS and were wrongly diagnosed as malignant ovarian tumours whereas two malignant tumours (endometrioid carcinoma, granulosa cell tumour) were diagnosed as benign ovarian tumours on TVS (Table IV). Therefore, there is a significant overlap in ultrasonic features of benign and malignant ovarian tumours.

TVS had slightly higher accuracy in making diagnosis of benign tumours and slight tendency to over diagnose malignant tumours (Table V). Of 15 malignant tumours on TVS, 12 were found to be malignant and 3

**Table I**  
Size of Tumour Measured by Transvaginal Sonography

Diameter in Cm	Benign		Malignant	
	No.	%	No.	%
< 5 cm	0	0	2	(14.2)
5-10 cm	20	(55.5)	4	(28.6)
> 10 cm	16	(44.5)	8	(57.2)
Total	36		14	

**Table II**  
Macroscopic Characterisation of Ovarian Tumours by transvaginal sonography and comparison with histopathological examination (HPE)

Macroscopic Characterization Of tumour	TVS Diagnosis				HPE diagnosis			
	Benign		Malignant		Benign		Malignant	
	No.	%	No.	%	No.	%	No.	%
Unilocular	14	(40)	0	0	14	(38.9)	0	0
Unilocular solid	5	(14.3)	2	(13.3)	4	(11.1)	3	(21.4)
Multilocular	16	(45.7)	0	(0)	15	(41.7)	1	(7.2)
Multilocular Solid	0	(0)	0	(53.4)	1	(2.0)	7	(50)
Solid	0	(0)	5	(33.3)	2	(5.5)	3	(21.4)
Total no. of Patients	35		15		36		14	

**Table III**  
**Correct Sonographic Diagnosis of Ovarian Tumours**

S. No.	TVS diagnosis	No.	HPE Diagnosis	No.
1.	Benign ovarian cyst	26	Serous cystadenoma	19
			Mucinous cystadenoma	6
			Corpus luteal cyst	1
2.	Benign papillary serous cystadenoma	1	Papillary serous cystadenoma	1
3.	Mucinous cystadenoma	2	Mucinous cystadenoma	2
4.	Dermoid	4	Benign cystic teratoma	4
5.	Malignant ovarian tumour	12	Papillary serous cyst-adenocarcinoma	5
			Serous Cystadenocarcinoma	1
			Mucinous cystadenocarcinoma	2
			Malignant cystic teratoma	1
			Endometrioid carcinoma	1
			Granulosa cell tumour	1
			Krukenberg tumour	1

**Table IV**  
**Erroneous sonographic diagnosis**

	TVS Diagnosis	HPE Diagnosis
Benign (n=3)		
1.	Solid ovarian mass	Fibroma
2.	Solid ovarian mass	Broad ligament fibroid
3.	Malignant ovarian mass (Multilocular solid ovarian mass)	Bilateral TO mass
Malignant (n=2)		
1.	Benign ovarian cyst	Endometrioid carcinoma
2.	Benign ovarian mass	Granulosa cell tumour

**Table V**  
**Accuracy of Vaginal Sonography in differentiation between benign and malignant ovarian tumours**

TVS diagnosis	Histology		
	Benign	Malignant	Accuracy
Benign (n=35)	33	2	91.6%
Malignant (n=15)	3	12	85.6%
Total	36	14	

being on histopathological examination.

The sensitivity and specificity of TVS in evaluating ovarian tumours was 85.6 per cent and 91.6 per cent respectively. The positive predictive value was 80 per cent and negative predictive value was 94.2 per cent.

#### Discussion

Better resolution provided by TVS produce a significant improvement in image resolution. This has allowed us to test the hypothesis that malignant tumours have morphological characteristics that may enable them

to be identified.

The more complicated the macroscopic appearance of ovarian tumour, higher the chances of malignancy. Chances of malignancy in a unilocular cyst were zero per cent in the present study and this was comparable to the study by Granberg et al (1990).

Tissue diagnosis was possible in 2 cases of mucinous cystadenoma and one case of papillary serious cystadenoma because of their characteristic appearance on TVS.

The appearance of dermoid on TVS was

classical and almost pathognomonic. Specific histologic diagnosis was not possible in any case of malignant ovarian tumour. Similar observations were made in various other studies (Meire et al, 1978; Deland et al, 1979; Requard et al, 1981).

In the present study using Granberg Sonographic criteria, the sensitivity was 82 per cent and specificity was 92 per cent which corresponded with the one reported by Granberg et al (1990) though other authors found TVS to be highly sensitive with low specificity (Sassone et al, 1991; Lerner et al, 1994). The difference may be due to the different sonographic criteria or screening system used in other studies.

### Conclusion

TVS was found to be highly efficient in assessing ovarian tumours. Although tissue characterization is not yet fully implemented, the ability

of TVS to detect tissue elements and to correlate the sonographic characteristics of these structures with their histopathological nature bring us closer to differentiate benign or malignant ovarian masses preoperatively.

### References

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