

ANALYSIS OF OVARIAN PATHOLOGIES IN THE MODERN PERSPECTIVE

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SUMMARY

The incidence of ovarian tumors and non-neoplastic conditions encountered in a population clinically diagnosed to have ovarian enlargement and subjected to laparotomy has been studied. This analysis, I feel, will conform to the standard pattern of occurrence of various ovarian pathologies. A clear understanding of the incidence of the various ovarian pathologies, neoplastic or non-neoplastic, and their age related incidence, should help the gynecologists prospectively diagnose, differentiate and decide on the most optimal management. Modern diagnosis employment ovarian imaging and current approach. Today, a preoperative sonographic diagnosis is possible at high resolution endovaginal ultrasound complemented by abdominal ultrasound in 92.93% of ovarian enlargements. Based on the precise preoperative judgment, exploratory laparotomy can be avoided in 67.21% of the ovarian pathologies which are replaced by either conservative operative laparoscopies or expectant management.

INTRODUCTION

In most cases suspicion of an ovarian tumor will arise during the gynecological examination. The characteristic morphology of various ovarian tumors and the typical macroscopic signs for a benign and

malignant tumor can be discerned at ultrasound. Such knowledge could help the gynecologists reduce the number of surgical interventions and adopt more of conservative approach to surgical treatment of ovarian tumors. The recent trend toward using laparoscopy for conservative surgery is a valuable approach. With good clinical judgment and optimal

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preoperative sonographic evaluation, the appropriate surgical remedy can be selected for majority of patients.

In the current perspective of newer diagnostic approaches and a thoroughly altered concept in favour of expectant and conservative management of ovarian tumors, it is essential that the clinician has a comprehensive knowledge of the incidence and nature of different ovarian tumors. This communication analyses the various ovarian tumors and their relative incidence as compared with the non-neoplastic ovarian pathologies encountered in the different age patient populations. This study also aims at study of age related incidence and morphological characterization of benign versus malignant tumors. My purpose is that this information should be prospectively applied for a preoperative clinical and sonographic standardization in decision making on expectant versus surgical treatment, and if surgery is indicated, to select the most

optimal surgical approach.

MATERIALS AND METHODS

Between November, 1991 and May, 1994 over the nearly 2 years and 6 months period 566 ovarian enlargements have been operated. Of them enlargements constituted 537 cases (94.88%) and the remaining 29 (5.12%) were solid ovarian masses. Ovarian tumors constituted 372 (65.72%) of the ovarian pathologies operated, and the remaining 194 were either endometriotic cysts 99 (17.49%) or functional cysts 95 (16.78%). Among the 372 ovarian tumors 343 were cystic tumors (92.20%) and 29 were solid (7.80%); and benign tumors were 315 (84.68%), and malignant tumors were 57 (15.32%). Incidence of malignancy in cystic tumor was 42 (12.24%), and in solid tumors 15 (51.72%).

ANALYSIS AND DISCUSSION

Incidence of ovarian tumors and the

Table I

Ovarian enlargements in different patient populations

Patient population	Total ovarian masses	Tumor	Endometrioma	Functional cysts
Operated for ovarian pathology	566	372 65.72%	99 17.49%	95 16.78%
Gynecological ultrasound	91	30	23	38
591	(15.40%)	32.97%	25.27%	41.76%
Operated for infertility	64	11	40	13
308	(20.78%)	17.19%	62.50%	20.31%
First and midtrimester pregnancies	34	7	2	25
1160	(2.93%)	20.59%	5.88%	75.53%

non-neoplastic ovarian pathologies such as endometriosis, functional cysts vary with the different populations of patients studied (Table I). In subjects undergoing gynecological surgeries the incidence of ovarian masses is 30.10% and among them 65.72% are ovarian tumors with a 15.32% risk of malignancy. Among the patients undergoing ultrasound study for gynecological symptoms 15.40% had ovarian masses, of whom 30% were ovarian tumors with 1/3 having the potential for malignancy. Among the surgically treated infertile subjects 20.78% had ovarian pathologies, with 17.19% incidence of neoplasm with no risk of malignancy. Of the pregnancy subjects seen in the first and midtrimester, only 2.93% had ovarian enlargements, with 20.59% incidence of tumors with no risk of malignancy. The most common ovarian enlargement among women operated for pelvic masses was ovarian tumor (65.72%). The commonest ovarian enlargement among women operated for infertility was endometrioma (62.50%). In pregnant

subjects the commonest cause of ovarian enlargement was functional cysts (75.53%). The incidence of ovarian tumors, endometrioma and functional cysts were almost equally distributed among subjects undergoing gynecological ultrasound.

Age (Table II and III)

Ovarian tumors occur more commonly after the age of 25 (82%), and only 18% occur below the age of 25 years. Majority of the ovarian tumors, 220 tumors, encountered in the reproductive age group (18 to 40 years) were cystic, 205 cysts, (93.18%); and these cystic tumors in general were benign, i.e., 203 of the 220 cystic tumors, (92.27%). Particularly in the reproductive age group, among the 205 cystic tumors 194 (94.63%) were benign. Even after the age of 40 years majority of ovarian tumors were cystic 90.79%, but evidence increased frequency of malignancy (22.46%). Of the total 29 solid tumors 26 (89.66%) were encountered after the age of 25 years, and malignancy rate for solid tumors

Table II
Analysis of ovarian enlargements encountered at surgery - I

Particulars	All Patients	< 25 years	26 to 40 years	> 40 years
Total	566	105(28.55%)	268 (47.35%)	193 (34.10%)
Neoplasms	372 (65.72%)	67(63.81%)	153 (57.09%)	152 (78.76%)
% of total	372	67(18.01%)	153 (41.31%)	152 (40.86%)
Cystic tumor	343 (92.20%)	64(95.52%)	141 (92.16%)	138 (90.79%)
Solid tumor	29 (07.80%)	3(04.48%)	12 (07.84%)	14 (09.21%)
Benign	286 (84.68%)	63(93.03%)	140 (91.50%)	112 (73.68%)
Malignancy	57 (15.32%)	4(06.97%)	13 (08.50%)	40 (26.32%)

Table III

Analysis of ovarian enlargements encountered at surgery - II

Particulars	All Patients	< 25 years	26 to 40 years	> 40 years
Cystic tumor	343	64(18.66%)	141 (41.11%)	138 (40.23%)
Malignancy	42 (12.24%)	3(04.69%)	8 (5.67%)	31 (22.46%)
Solid tumor	29	3(10.34%)	12 (41.38%)	14 (48.28%)
Malignancy	15 (51.72%)	1(33.33%)	5 (41.67%)	9 (64.29%)
Dermoid	66 (17.74%)	20(29.85%)	32 (20.96%)	14 (09.20%)
Endometrial cyst	99 (17.49%)	21(20.00%)	62 (23.13%)	16 (08.29%)
Functional	95 (16.78%)	17(16.19%)	53 (19.77%)	25 (12.93%)

increased with age, from 33.33% for <25 years to 41.67% between 26 and 40 years, and 64.29% after the age of 40 yrs. Occurrence of ovarian endometrioma and functional cysts declined with age from 20.00% and 16.19% respectively for < 25 years to 8.29% and 12.93% respectively > 40 years.

Cystic Tumors (Table IV and V)

Among the total 343 cystic tumors there

were 42 (12.24%) malignant neoplasms. Of the 183 unilocular tumors 15 were malignant (8.20%) and among the 160 multilocular cysts 27 were malignant (16.88%). Thus the incidence of malignancy was almost double in multilocular cystic tumors. Below 25 years unilocular cysts, whether unilateral or bilateral (total 46), did not evidence malignancy. However, in this age group malignancy

Table IV

Cystic tumors of the ovary - I

Particulars	All Patients	< 25 years	26 to 40 years	> 40 years
Unilocular unilateral	183	40	83	60
Malignancy	15 (8.20%)	nil	2 (2.41%)	13 (21.67%)
Bilateral unilocular	45	6	14	25
Malignancy	14 (31.11%)	nil	4 (28.57%)	10 (40.00%)
Multilocular	115	18	44	53
Malignancy	13 (11.30%)	3(16.67%)	2 (4.55%)	8 (15.09%)

Table V

Cystic tumors of the ovary - II

Particulars	< 25 years	Upto 40 years	> 40 years
Unilocular unilateral	40	123	60
Malignancy	nil	2 (1.63%)	13 (21.67%)
Unilocular unilateral or bilateral	46	143	85
Malignancy	nil	6 (4.20%)	23 (27.06%)
Multilocular	18	62	53
Malignancy	3 (16.67%)	5 (8.06%)	8 (15.09%)

was observed in 3 of the 18 multilocular cysts (16.67%). Between 26 and 40 years, among 97 unilocular cysts 6.19% were malignant, of which unilateral cysts had 2.41% incidence of malignancy, and bilateral cysts 28.57%.

In the reproductive age group the incidence of malignancy in cystic tumors has been (5.37%); and particularly among those 123 subjects who had unilocular unilateral cysts, which formed 35.86% of the total cystic tumors, occurrence of malignancy was considerably minimal

(1.63%). Among the remaining 82 cystic tumors in this age group, which were multilocular and/or bilateral, the incidence of malignancy has been 10.96%. Above 40 years, irrespective of the nature of the cystic enlargements, the incidence of malignancy in cystic tumors ranged from 15.09% to 40.00%.

Serous Cystadenoma (Table VI)

There were 166 cases of serious cystadenomas, and this formed 23.33% of all ovarian enlargements; 30.91% of all

Table VI

Serous cystadenoma of the ovary

Total : 166

Age	Total	Benign	Malignancy	Malignancy in	
				Serous	Papillary
All	166	137 (82.53%)	29 (17.47%)	11.11%	33.66%
18-25	26 (15.66%)	26 (100%)	nil	nil	nil
26-40	65 (39.16%)	59 (90.77%)	6 (9.23%)	6.52%	17.65%
41-75	75 (45.18%)	50 (66.67%)	25 (33.33%)	19.27%	46.43%

ovarian cysts; 44.62% of all ovarian tumors; and 48.40% of all cystic ovarian tumors. Among them 29 (17.47%) were malignant and it constituted 50.88% of all the ovarian malignancies. Thus serous cystadenoma forms the commonest of ovarian tumors and the commonest to evidence malignancy. There is no malignancy reported among the 26 serous tumors in the younger subjects (18 to 25 years). The incidence of malignancy increases from 9.23% in 26 to 40 years age group to 39.67% for subjects past 40 years. At any age incidence of malignancy is almost 3 times more for papillary tumors (33.66%) as against those for simplex serous cystadenomas without papillary excrescences (11.11%).

Mucinous Cystadenoma (Table VII)

There were 100 cases of mucinous cystadenomas, and this formed 17.67% of all ovarian enlargements; 18.62% of all ovarian cysts; 26.88% of all ovarian tumors; and 29.15% of all cystic ovarian tumors. Among them 13.00% were malignant (8% overt malignancy and 5% borderline malignancy) and it formed 22.81% of all the ovarian malignancies.

Thus between serous and mucinous cystadenoma, they form 71.51% of all ovarian tumors and 73.68% of the total ovarian malignancies. Incidence of malignancy in mucinous tumors below the age of 40 years is (5.71 to 6.66%) which is increased by 3 to 4 folds after the age of 40 years, to nearly 20%.

Dermoid

There were 66 cases of cystic teratomas (dermoid), and this formed 11.66% of all ovarian enlargements; 12.29% of all ovarian cysts; 17.74% of all ovarian tumors; and 19.24% of all cystic ovarian tumors. There were no malignancies reported in this series except for one case of solid malignant teratoma. Incidence of dermoid declined with age, from 29.85% below 25 years to 9.20% after the age of 40 years.

Solid Tumors

The solid tumors encountered include fibroma, thecoma, Brenner tumor, fibrosarcoma, germ cell tumors, dysgerminoma, malignant teratoma. Solid tumors are majority of times bilateral, with 21 of 29 tumors being bilateral (72.40%); and

Table VII
Mucinous cystadenoma of ovary
Total : 100

Age Group	Total	Benign	Percentage	Malignant	Percentage
All	100	87	87	13	13.00
18 - 25	15	14	93.34	1	6.66
26 - 40	35	33	94.29	2	5.71
41 - 75	50	40	80.00	10	20.00

less often unilateral 8 (27.58%). Incidence of malignancy in solid tumor in 15 (51.72%), and breakdown shown that 12.50% of unilateral and 66.67% of bilateral tumors were malignant. Of the 29 solid tumors 3 were seen in 18 to 25 years age group (10.34%); and the remaining 26 were equally distributed in 26 to 40 and > 40 yrs group.

Malignant Tumors (Table VIII)

Majority of malignant tumor, namely, 42 of the 57, were serous or mucinous cystadenoma carcinoma, forming 73.68% of all the malignant tumors; and the remaining 15 tumors were endometrioid tumors malignant teratoma, dysgerminoma, fibrosarcoma and germ cell tumors. Among the total 57 malignant tumors 8.77% were in the younger age group, and 45.61% were seen in women over 50 years of age. Majority of malignant

Table VIII
Age and Parity of malignancy
ovarian tumors
Total : 57 tumors

Age and Parity	Total Number	Percentage
21 to 30 years	5	8.77
31 to 40 years	10	17.54
41 to 50	16	28.07
51 to 75	26	45.61
Nulliparous	11	19.30
Para 1 to 3	24	42.10
Para 4 and above	22	38.60

ovarian tumors were in parous subjects, and only 19.3% of malignant tumors were encountered in nulliparous subjects.