Sonographic and histopathological findings in ovarian dermoid cyst

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ABSTRACT

Introductions: Ovarian dermoid cyst occurs most commonly in reproductive age group. It consists all three layers of germ cells, in variable composition resulting in wide spectrum of USG findings. This study aimed to find the association between sonographic and histopathological findings of dermoid cyst.

Methods: This was a retrospective study consisting of 55 cases of complex ovarian cysts with features of dermoid cyst, during two years 2013-2015. The diagnostic accuracies of trans-abdominal sonography findings were compared with post-operative histopathology reports.

Results: Among 55 cases of complex ovarian cyst with sonographic features of dermoid, histopathology was benign in 52 (94.5%) and malignant in 3 (5.5%). In 52 benign cysts, 25 (48.0%) were teratoma and 27 (51.9%) were other benign masses.

Conclusions: The accuracy of ultrasound was 95% in the diagnosis of ovarian cyst and is the modality of choice for initial workup of ovarian mass.

Keywords: complex ovarian mass, dermoid cyst, histopathology, sonography

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INTRODUCTIONS

Dermoid cysts are benign germ cell tumors.[1] They are composed of well-differentiated tissues of at least two of the three germ layers (ectoderm, mesoderm and endoderm).[2, 3] It occurs most commonly in reproductive age group women. Unlike other tumors of ovary, dermoid cysts have a wide age distribution and may be seen from infancy to old age. The size of dermoid cysts may be extremely variable. They can be found accidentally when they measure just around one centimetre and are situated inside the ovary without causing ovarian distortion. They can also have gigantic dimension of 40 cm or more.[4] Usually when they are diagnosed, dermoid cysts measure less than 10 cm and most of the time they are asymptomatic.[5] USG is an easily available and accessible non-invasive invaluable diagnostic tool and now used as the first preoperative workup method of choice for the assessment of ovarian cysts.[6]

Thus, the aim of this study was to find the association between sonographic findings and histopathological diagnosis of complex ovarian cysts with features of dermoid cyst.

METHODS

This was a retrospective cross-sectional study consisting of 55 sonographically diagnosed complex ovarian cysts with features of dermoid in Radiology Department at Patan Hospital, Nepal during two years from 2013 to 2015. Trans-abdominal ultrasound was performed in longitudinal, transverse and oblique plane by 3.5 MHz convex probe using Medison, Aloka, Sonosite machines. The sonographic findings were compared with post-surgery histopathological reports for diagnostic accuracy.

Fisher's exact test was performed to establish the association between sonographic findings and histopathological diagnosis. A p-value less than 0.05 was considered statistically significant. Data entry and analysis was done using IBM SPSS Version 20 software.

RESULTS

There were 55 complex ovarian cysts with features of dermoid during two years study period. Postoperative histopathology was benign in 52 (94.5%) and malignant in 3 (5.5%). Out of 52 benign cysts, 25 (48.0%) were teratoma and 27 (51.9%) other benign masses, (Table 1).

Age range of the patients was 19 to 80 years, mean 36 (SD 12.19). Among 26 patients below 36 years of age, 16 (61.5%) had teratoma and 10 (38.4%) other benign masses. The 29 patients above 36 of age, 9 (31.0%) had teratoma, 17 (58.6%) other benign tumors and 3 (10%) malignant, (Table 1).

Statistically, the age group, menstrual status, ovarian mass number, clinical features, tumor volume category, content of the cysts and ascites had no significant association with pathological findings. Wall thickness, septations, peritoneal deposit and tumor markers had statistically significant association with pathological findings. (Table 2).

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Table 1. Characteristics of the patients (n=55) with ovarian cysts

Characteristics	Number of Cases (N)	Percentage
Age		
<36	26	47.3
>=36	29	52.7
Menstrual status		
No	8	14.5
Yes	47	85.5
Ovarian mass number		
U/L unilateral	48	87.3
B/L bilateral	7	12.7
Clinical Features		
Symptoms	41	74.5
No symptoms	14	25.5
Tumor volume category		
<500	38	69.1
>=500	17	30.9
Wall thickness		
<3 mm	36	65.5
>=3mm	19	34.5
Septation		
No	22	40.0
<3mm	23	41.8
>3mm	10	18.2
Contents		
Mostly cystic	20	36.4
Mostly solid	8	14.5
Mix	27	49.1
Ascites		
No	54	98.2
Yes	1	1.8
Peritoneal Deposit		
No	53	96.4
Yes	2	3.6
Pathological Findings		
Benign	52	94.5
Malignant	3	5.5
Tumor Marker		
<235	45	81.8
235-999	7	12.7
=>1000	3	5.5

Table 2: Association of pathological findings of ovarian cysts (n=55) with patients characteristics

Characteristics	Pathological Findings			Statistical Test of Association	p-value
	Benign	Malignant	Total		
Age					
<36	26	26	52	Fisher's Exact Test	0.238
>=36	0	3	3		
Menstrual status					
No	6	2	8	Fisher's Exact Test	0.52
Yes	46	1	47		
Ovarian mass number					
U/L	45	3	48	Fisher's Exact Test	1.00
B/L	7	0	0		
Clinical Features					
Symptoms	38	3	41	Fisher's Exact Test	0.562
No symptoms	14	0	14		
Tumor volume					
<500	37	1	38	Fisher's Exact Test	0.223
>=500	15	2	17		
Wall thickness					
<3 mm	36	16	52	Fisher's Exact Test	0.037
>=3mm	0	3	3		
Septation					
No	22	0	22		
<3mm	22	1	23	Fisher's Exact Test	0.037
>3mm	8	2	10		
Contents					
Mostly cystic	20	0	20	Fisher's Exact Test	0.052
Mostly solid	6	2	8		
Mix	26	1	27		
Ascites					
No	52	2	54	Fisher's Exact Test	0.055
Yes	0	1	1		
Peritoneal Deposit					
No	52	1	53	Fisher's Exact Test	0.002
Yes	0	2	2		
Tumor Marker					
<235	45	45			
235-999	7	7		Fisher's Exact Test	0.000
=>1000	0	3			

DISCUSSIONS

In our study, the complex ovarian masses with features of dermoid cysts on sonographic findings, the postoperative histopathology were benign in 95% and malignant in 5%. The sonography was correct in diagnosis 95%. The sonographic appearance of ovarian masses varies from a predominantly solid to cystic

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appearace[7] depending upon overall composition.[8] Our findings are in concordance with other international studies reporting the sensitivities and specificities of ultrasound between 85-100%.[9, 10]

We found malignancy was related with increased age, with all three cancers out of 55 ovarian cysts in age above 36 years. In our study, tumor volume had no significant association with malignancy, similar to the reported study.[11] However, 67.2% of benign tumors were smaller than 500 ml whereas 66.6% of the malignant were larger than 500 ml, which suggests that smaller ovarian lesions are more likely to be benign.

In our study, wall thickness less than 3 mm, no or thin septations were reliable indications of benign cysts, whereas peritoneal deposits and tumor markers > 1,000 suggested malignancy, similar to the reported study.[12]

Specifically, wall thickness less than 3 mm, no or thin septations, absence of peritoneal deposits were found to be statistically associated with the benign nature of the cyst. Similarly, anechogenic lesions have high likelihood of being benign tumors.[11]

Some of the limitations of this study could be small sample size and use of various machines and different operators.

CONCLUSIONS

In conclusion, this study yielded the diagnostic accuracy of ultrasound to be 95% in the diagnosis of ovarian masses, increasing its reliability. Thus, ultrasound seems to be an initial modality of choice in the workup of every woman suspected of having an ovarian mass.

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