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ULTRASONIC DIAGNOSIS OF OVARIAN TUMORS AT SHIMANE MEDICAL UNIVERSITY HOSPITAL

(ultrasound/ovarian tumor/diagnosis)

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Comparative study with ovarian tumors between ultrasonic and histological diagnoses was performed on 64 patients who had all undergone laparotomy, and diagnosed histologically at Shimane Medical University Hospital from October '79 to September '83. The ultrasonically correct diagnostic rate of ovarian tumors was 80.0% (52 out of 65 cases). With ultrasonic diagnosis of malignant ovarian tumors, the false positive rate was 22.2% (4 out of 18 cases), and the false negative rate nil (0 out of 47 cases). Therefore, for helping to decide between benign and malignant, ultrasonography should be a pertinent diagnostic tool in the primary screening of ovarian tumors.

Many investigations of pelvic mass, especially ovarian tumor, have been done by ultrasonography, and its usefulness, pitfalls, and problems have been discussed (1-6).

In this paper, we examined 65 cases with ovarian tumors during the last 4 years in our hospital, and carried out a comparative study between ultrasonic and histological diagnoses of ovarian tumors in order to ascertain the usefulness of ultrasonography as a primary screening method for ovarian tumors.

MATERIALS AND METHODS

Sixty four patients with ovarian tumors, a total of 65 cases, were examined ultrasonically and histologically after

Fig.1. Ultrasonogram of serous cystadenoma.

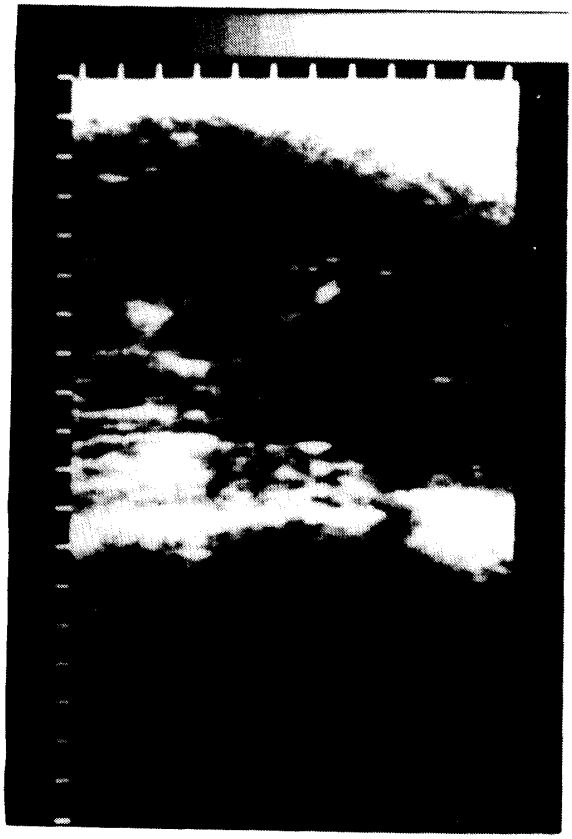


Fig.2. Ultrasonogram of mucinous cystadenoma.

operation at Shimane Medical University Hospital from October '79 to September '83.

All ultrasonograms were retrospectively assessed, and the diagnoses were compared with the histological diagnosis in each case.

The instruments used were Aloka SSD-180, Sonovista P MODEL MEU-1572, and Sonovista-PH.

RESULTS

In serous cyst, the tumor was monolocular, had no solid part within it, and the wall of the tumor was thin and smooth on the ultrasonogram (Fig.1). In this case, pregnancy was associated with the cystic tumor. In mucinous cyst, the tumor was multilocular with thin and mild rough septum, and had no solid area inside it on the ultrasonogram (Fig.2). Dermoid cyst of the

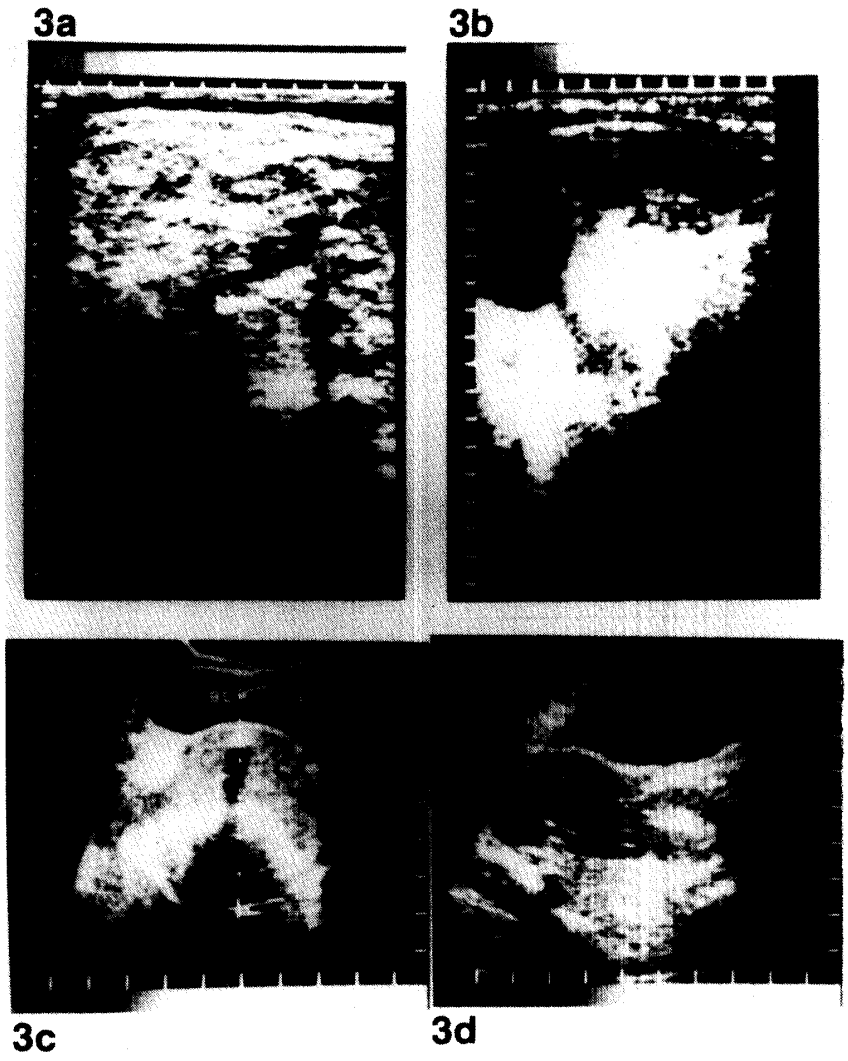
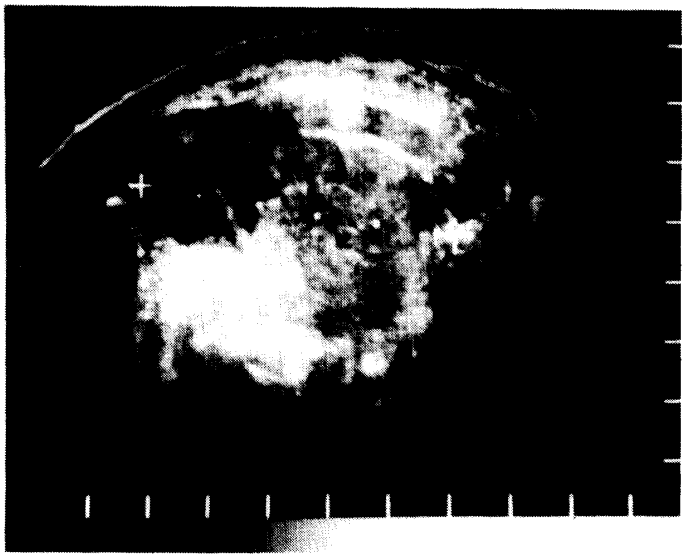


Fig.3. Ultrasonograms of dermoid cyst.

ovary had many varieties in ultrasonic patterns; namely, undetectable solid echoes which resembled bowel gas (Fig.3a), an echogenic focus within a cystic mass (Fig.3b), two layers of different homogeneous echoes and solid part with acoustic shadow (Fig.3c), and fluid level within a cystic mass (Fig.3d). In endometrial cyst, the tumor was cystic with fine granular echoes, and sometimes had a soft homogeneous solid part due to coagulation within the cystic mass (Fig.4). In malignant ovarian

Fig.4. Ultrasonogram of endometrial cyst.

5a



5b

Fig.5. Ultrasonograms of serous cystadenocarcinoma (5a) and ascites (5b).

Fig.6. Ultrasonogram of mucinous cystadenocarcinoma.

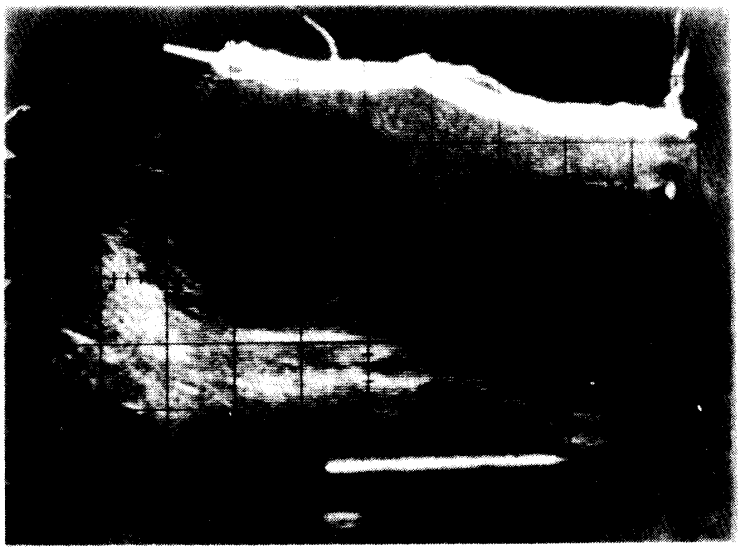


Fig.7. Ultrasonogram of choriocarcinoma.

tumors, there were many malignant patterns; irregular solid mass with rough septum within a cystic area (Fig.5a), and abundant ascites (Fig.5b) in serous cystadenocarcinoma, a solid mass with a multiple cystic part in mucinous cystadenocarcinoma (Fig.6), a

Fig.8. Ultrasonogram of granulosa theca cell tumor.

Table I. COMPARISON BETWEEN ULTRASONIC AND HISTOLOGICAL DIAGNOSES

Ultrasonic diagnosis		Histological diagnosis	
Benign tumors	47		
serous cyst	11	serous cystadenoma	7
		paraovarian cyst	1
		endometrial cyst	1
		dermoid cyst	1
		cervical myoma	1
mucinous cyst	6	mucinous cystadenoma	6
dermoid cyst	18	dermoid cyst	16
		follicular cyst	1
		serous cystadenoma	1
endometrial cyst	8	endometrial cyst	6
		serous cystadenoma	1
		hydrosalpinx	1
fibroma	2	fibroma	1
		fibro-thecoma	1
lutein cyst	1	lutein cyst	1
hypertrophic ovary	1	corpus letein cyst	1
Malignant tumors	18	mucinous cystadenocarcinoma	5
		papillary cystadenocarcinoma	4
		serous cystadenocarcinoma	1
		mesonephroid carcinoma	1
		endometrioid adenosquamous carcinoma	1
		granulosa theca cell tumor	1
		choriocarcinoma	1
		mucinous cystadenoma	1
		corpus lutein cyst	1
		dermoid cyst	1
		serous papillary cystadenoma	1

papillary shaggy solid part within a cystic mass in choriocarcinoma (Fig.7); and a wheel-like multilocular cystic tumor with a homogeneous solid part in granulosa theca cell tumor (Fig.8).

The comparison between ultrasonic and histological diagnoses is shown in Table I. Ultrasonically correct diagnostic rate of ovarian tumors was 80.0% (52 out of 65 cases). With ultrasonic diagnosis of ovarian malignant tumors, the false positive rate was 22.2% (4 out of 18 cases), and the false negative rate nil (0 out of 47 cases).

DISCUSSION

Many papers reporting ultrasonographical findings of ovarian tumor have been published (1-6). Some of them have reported comparisons between ultrasonical findings and physical examination (2, 3); others have reported the ultrasonographic criteria which would help the ultrasonographer formulate the most likely diagnosis based on the clinical data (6). In this study, the ultrasonic diagnoses of ovarian tumors were retrospectively determined only by ultrasonic findings without any other information, and compared with the histological diagnoses. The role of ultrasonography in primary screening of ovarian tumor is then discussed.

With ultrasonic findings of malignant ovarian tumor, Rosenberg et al. (6) pointed out the sonographic criteria which would help the ultrasonographer formulate the most likely diagnosis, (1) the sharpness of the borders throughout the circumference, (2) the presence of more than just a minimal amount of debris in the dependent portion of the lesion resulting in a speckled or mixed echotexture, (3) the presence of a solid echo pattern or septations within a lesion, and (4) the presence of ascites. Moreover, the margins of benign lesion appear echographically clear and sharp, while indistinct margins are suggestive of malignancy or inflammatory lesions. (6) Sandler et al. (7) reported that a solid component within a large, cystic, sharply marginated lesion in a young patient suggests a teratoma. On the other hand, if the margins of a lesion are not distinct in an older patient, malignancy should be suspected (8). Fleischer et al. (9) commented that ultrasonography had great ability to portray the internal consistency of an ovarian tumor.

According to their study evaluating the sonographic features of benign and malignant ovarian cysts, the presence of thick septa and solid nodules within a predominantly cystic mass was much more common in malignant ovarian cysts than in benign ones, and one should be dissuaded from making a specific histological diagnosis on the basis of a sonographic examination, and on the presence of features usually associated with a malignant tumor (9).

With those points in mind, we evaluated the ultrasonograms of ovarian tumor.

Dermoid cyst is a benign ovarian tumor, but differentiation between this kind of tumor and malignant ovarian tumor is very difficult. Higgins et al. (10) reported that the more common characteristics of a dermoid cyst were a flat-fluid level, a mass with a calcified rim, acoustic shadowing which is known as the tip-of-the iceberg sign, and a solid tumor which appear similar to normal pelvic contents, such as the bowel. Laing et al. (11) reported that no single ultrasonographic pattern for ovarian dermoid cyst had emerged. In our study, dermoid cysts had many faces in their ultrasonograms, such as, undifferentiated mass similar to bowel gas, high echogenic focus within a cystic mass, two layers of different homogeneous echoes and a solid part with acoustic shadow, and fluid level within a cystic mass (Fig.4). Moreover, although Sandler et al. (7) described a number of characteristic features of teratomas, e.g. axial location, solid mural component, acoustic shadow, and hair/fluid level, these occurred only in a minority of cases. Although an ultrasonogram which has one or more of the features mentioned above may suggest the diagnosis of a benign dermoid cyst, ovarian malignancy should not be excluded. Even if dermoid cyst might normally be suspected, further examination should be considered necessary.

In this study, the ultrasonically correct diagnostic rate of ovarian tumors was 80.0% (52 out of 65 cases). With ultrasonic diagnosis of malignant ovarian tumors, the false positive rate was 22.2% (4 out of 18 cases), and the false negative rate nil (0 out of 47 cases). Although histological diagnosis of ovarian tumors cannot be done by ultrasonography alone, these results show that in ultrasonic diagnosis there was no failure in detecting malignant ovarian tumors. Therefore, ultrasonography should be performed as a pertinent diagnostic tool in the primary screening of ovarian tumors.

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