Trans-vaginal sonography: Is it helpful in differentiating benign from malignant ovarian tumours?

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Abstract:
Background: The ovary is unique in the range of tumours that may arise from it, and the numbers of malignant tumours from other primary sites that can metastasize to it. Ovarian cancer is largely asymptornatic in its early stages and the majority of patients are presented with advanced intra-abdominal diseases.
Objectives: To find out if trans-vaginal sonography can be helpful in differentiating benign from malignant ovarian tumours.
Material and method: Prospective study carried out at Al-Jamahirya Teaching Hospital, Department of Gynaecology, Benghazi in Libya. In 162 women with ovarian mass in the age group between 16-67years. Laparatomy was performed and the mass was subjected to histopathological examination. The value of the following trans-vaginal ultrasound features were assessed: the tumour size, unilateral or bilateral, unilocular or multilocular, thin or thick wall, solid areas, papillary projections, pelvic nodules and ascitis.
Results: We found that the size of the tumour is not helpful to differentiate benign from malignant ovarian lesions. Other ultrasound features seen in malignant ovarian masses are: multilocular (44.4%)of malignant and (29.9%) of benign masses; papillary projections were present (55.6%) of malignant and (22.9%) benign lesions, bilateral masses seen in (44%) malignant and (27.8%) benign masses, solid areas were found in (77.8%) of malignant and (18.8%) of benign tumours, pelvic nodules were present in (66.6%) of malignant and (0%) of benign masses, while ascitis was found in (66.7%).of malignant and (0.7%) of benign masses.
Conclusion: Trans-vaginal scaning was helpful in differentiating between benign and malignant ovarian tumours. Ovarian malignancy should always be considered when the mass is bilateral, multilocular, with thick wall solid areas. When pelvic nodules or ascitis is present in association with a pelvic mass, the mass is almost always malignant. But there is no guarantee that masses not having these features are not malignant or will not undergo malignant changes if ignored.

Introduction:

The ovary is unique in the range and variety of tumours that may arise from it, and the numbers of malignant tumours from other primary sites that can metastasize to it.[1] Worldwide, some 140,000 new cases are diagnosed each year, and the disease is responsible for the greatest number of deaths from gynaecological malignancy in Europe and North America (Parkin).[2] Ovarian cancer is largely asymptomatic in its early stages and around 70% of cases are presented with advanced intra-abdominal disease, by which time the prognosis is usually poor.[3] The concept of earlier diagnosis in ovarian cancer has become a real possibility during the last two decades. Through the 1970s and 1990s improvement in ultrasound technology and scanning skills have meant that visualization of the ovaries has become possible. Since the mid-l980s, with technical advances in instrumentation, and imaging, trans-vaginal ultrasonography has gained in popularity.[4] The advantage of trans-vaginal sonography is that the transducer is closer to the subject of interest and not separated from them by fat and muscle. The pelvic organs can therefore be studied with higher ultrasound frequencies, producing images of greater resolution and enhanced quality, and also the need for full bladder is obviated. The objectives of this study were to see if trans-vaginal sonography can be helpful in differentiating benign from malignant ovarian tumours.

Materials and Methods:

This study was carried out in our ultrasound unit in the gynaecolouy department at Al-Jamahirya Hospital, Benghazi-Libya, during the period from 1st January 1995 to end of December 1997 using an

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ultrasound unit (Aloka SSI) 256, Japan), with vaginal transducer of 5.5 MHz. The age of patients included in this study was between 16-67 years. All the patients were referred to the ultrasound unit either because of suspected or persisting pelvic mass. Those in whom an ovarian mass was found and in whom laparotomy was performed and the mass was subjected for histopathological examination were included in this study. The following ultrasound characteristics were carefully evaluated in every mass, its size, unilateral or bilateral, unilocular or multilocular, presence of thin or thick wall, solid areas, papillary projections, pelvic nodules and ascitis.

Results:

During the study period a total of 221 patients were referred because of' suspected or persisting pelvic mass. In only 196 of them a pelvic mass was found. In 162 of them an ovarian mass was diagnosed by trans-vaginal scanning, and in whom laparotomy was done and the mass was examined histopathologically in Al-Arab Medical University (Pathology department). In 144 of the 162 patients the histopathological examination shows a benign lesion (88.8%), while malignancy was found in only 18 patients (11.2%). Table I shows the histopathological diagnosis in 144 benign ovarian masses.

Table I. Histopathological diagnosis in 144 benign masses

Serous cyst adenoma	Mucinous cyst adenoma	Follicular cyst	Dermoid cyst	Endometrioma	Fibroma	C.L. cyst	Brenner's	Total
65	43	20	7	4	3	2	2	144
45.5%	29.8%	13.8%	4.9%	2.8%	1.4%	1.4%	1.4%	100%

Table II. Histopathological diagnosis in 18 malignant ovarian tumours

Serous cyst adenoma	Mucinous cyst adenoma	Teratoma immature	Granulosa Cell Tumour	Endometrioid Carcinoma	Dysgerminoma	Krukenbeg Tumour	Total
7	4	2	2	1	1	1	18
38.8%	22.2%	11.1%	11.1%	5.6%	5.6%	5.6%	100%

In this study we found that the majority of the ovarian masses were larger than 5cms in diameter in 146 patients (90.1%), with 134 benign and 12 malignant. Ovarian masses less than 5cms in diameter were seen in 16 patients (9.9%), with 10 benign and 6 malignant lesions. The size in the benign lesions was between 3.9-4.8cms, while in the malignant lesions was between 3.5-4.5cms, the malignant lesions were found in one pre-menopausal and five post-menopausal women, three of whom were above the age of 61 years. They include one endometrioid carcinoma, two cystadeno-carcinorna, and three mucinous adenocarcinomas. Unilateral ovarian masses were seen in 114 patients (70.3%) with 104 (72.2%) benign and 10(55.6%) malignant. Bilateral masses were present in 48 patients (30%). In 40 (27.8%) of cases, the mass was benign, and in 8(44.4%) was malignant. Multilocular variety was found in 51 (31.5%) with 43 (29.9%) benign and 8 (44.4%) were malignant. Whereas thick walled masses were present in 65 (40.1%) of cases, 52 (36.1%) were benign and 13(72.2%) were malignant. All the follicular and corpus luteum cysts were thin walled except one corpus luteum cyst found in a pregnant patient at 15 weeks gestation; the wall was thick with bleeding into the cyst, one thin walled bilateral masses found to he secondaries (Krukenherg tumour) from a primary in the stomach discovered two weeks after operation. Presence of papillary projections in the ovarian masses was found in 43 (26.5%) of cases, 33 (22.9%) benign and 10 (55.6%) were malignant. These papillary projections were seen in some areas in 4 serous and 4 Mucinous cyst adenocarcinoma, one granulosa cell tumour and one endometrioid carcinoma. Solid areas within the mass were found in 41 (25.3%) of the cases, 27 (18.8%) benign and 14 (77.8%) malignant. These solid areas were present in 7 dermoid cysts of variable size 5-15 cms. in

diameter; two were bilateral, and all were seen in childbearing age. Two cases of fibroma were seen in 43 and 47 year old patients. None of them had clinical features of Meig's syndrome. One Brenerr tumour was completely solid, 10 were serous and 7 mucinous cystadenomas. Among the 18 malignant masses, 4 were mucinous cystadeno-carcinoina, 7 serous cystadenocarcinoma, 2 malignant teratoma, 2 granulosa cell tumour, one endometrioid carcinoma and own dysgerrninoma, and one Krukenberg tumour. Pelvic nodules were present in 12 patients (7.4%). None of the benign ovarian masses were associated with pelvic nodules (0%), while in 12 (66.7%) malignant masses pelvic nodules were present. The nodules were seen in 4 serous and 5 mucinous cystadeno-carinoma, 2 granulosa cell tumour and one krukenberg tumour. Presence of ascitis was seen in 13 patients (8%), in one benign mass (0.7%) and in 12(66.7%) malignant masses. All the cases in which pelvic nodules were present ascitis was found. In one benign mass in a 37 years old patient with multilocular muctnous cystadenoma 20 cm in size fluid was found in peritoneal cavity possibly due to rupture of one of the loculi.

Discussion:

Trans-vaginal ultrasonography is found to be quite accurate in diagnosis of pelvic masses in general and those of ovarian origin in particular. Recent advance in ultrasound technology have improved imaging of adnexal masses (Fleisher, 1988).[5] However difficulties in interpretation remains. Finkler et al (1988)[6] have reported a two fold increase in sensitivity, from 38% to 62% in diagnosis of ovarian cancer between initial ultrasound reports and review, or expert interpretation. Moyle et al, (1983)[7] and Benacerraf et al, (1990)[8] stated that ultrasound features of malignancy may be shared by benign ovarian pathology. On reviewing the ultrasound characteristics of the benign and malignant ovarian masses, we noticed that the size of the mass alone is not helpful in differentiating benign from malignant ovarian masses, unless associated with some of these features such as thick wall, papillary projections, multilocularity, solid areas, pelvic nodules and ascitis. We were able to detect 6 (3.7%) cases of ovarian malignancy in one pre-menopausal and 5 post-menopausal women, in spite of the mass being unilateral and less than 5 cms in diameter. Because of presence of solid components, mutlilocularily in addition to the age of the patient malignancy was suspected. This finding was supported by the findings of many authors.[9,10,11] Rulin & Preston (l987)[12] described one malignancy in 32 cysts less than 5 cms in diameter. Our view is that a mass is considered suspicious if some of the previously mentioned features are present especially in the elderly, or if the lesion persists, we believe that surgical exploration would seem to be a wise precaution. In our series if we follow the concept that ovarian masses less than 5 cms in diameter are usually benign, then 5 of our patients with malignant ovarian lesions would have been missed, or the diagnosis would have been delayed. Rulin and Preston (1987)[12] found a 3% of malignancy in masses of less than 5 cms, which is slightly lower than our figure (3.7%). This finding was supported by Flail and McCarthy (1986).[13] In pregnancy it is reasonable to assume that most cysts will be benign (Thornton and Wells, 1987).[14] and indeed when the cyst is unilocular and less than 5 cms, malignancy is not only unlikely (Meirre, 1978)[9], but spontaneous resolution can be expected. The present study revealed that bilateral ovarian lesions were noticed in 48 (30%) of our patients with 8 (44.4%) of cases being malignant. We think that bilaterality is helpful especially if associated with other features mentioned before, and if the patient is old, then malignancy is a real possibility. This belief is supported by (Hail and McCarthy, 1986)[13], and (Gross, 1987).[15] Multilocular ovarian lesions were seen in 51 (31.5%) of our patients. Malignancy was diagnosed in 8(44.4%), compared to 43 (29.9%) of those with benign lesions. This finding was noticed in a study by Meirre (1978)[9], who stated that a multilocular cyst is more likely to be a malignant than one which is unilocular. However, Thornton and Wells (l987)[14], stated that there is no guarantee that unilocular cyst will be benign. Rhoden and Steinhirik (1983)[16], noticed that the presence of irregular thickened wall, nodules and amorphous calcifications have shown to be strongly suggestive of malignancy. However, the irregular thickening of the cyst wall may he the result of inflammatory or neoplastic process involving the wall or vasculogenic oedema due to torsion of the cystic mass on its pedicle. Clot adherent to the wall of a haemorrhagic cyst may also produce an irregular wall, this was observed by Balfarowich (1985)[17] and Reynolds (1986)[18]. We clearly found in this series that when the tumour wall was thick, the chance of being malignant is high, (72.2%) malignant versus

(36.1%) benign. Papillary projections when present were considered as a sign of malignancy. Among our patients this was seen in (55.6%) of the patients with malignancy, compared to (22.9%) of patients with benign lesions. This finding was previously confirmed by many investigators Moley and Barnette (1970)[11], Kobayashi (1970)[19], who said that more complex lesions tend to be malignant. Rhoden and Steinhirik (1970)[16] believe that the presence of' solid areas found tends to be strongly associated with malignancy. While Gross et al (1983)[24] says that any ovarian mass with large solid areas should be suspected as being malignant, we agree with the view of Meirre (1978)[9], who stated that lesions with solid parts are often malignant and immediate surgery is necessary. Pelvic nodules were seen only in patients with malignant lesions (66.7%), and in none of the benign ones. This confirms the fact that malignant ovarian tumours tend to be discovered late in the majority of cases. Similar results were obtained by Kottmeier (1982)[24] and Priver (1987)[25]. Ascitis as a sign of malignancy was noticed a long time back in ovarian tumours, this was present in 13 patient in 12 (66.7%) were malignant, and all were associated with pelvic nodules. Only one (0.7%) benign mass showed a little fluid which was mentioned before. This was similarly demonstrated in previous studies by Kottrneier (1982)[24] and Priver (1987)[25].

Conclusion:

Although sometimes the sonographic findings may not give a specific diagnosis, clinically useful information can usually be obtained. Ovarian malignancy should always he considered when any of these trans-vaginal ultrasound features are present, the mass being bilateral, multilocular, with thick wall, with solid areas, papillary projections, and the patient is old. Surgical intervention is a wise decision. When pelvic nodules or ascitis is present in association with an ovarian mass, then it is almost always malignant, with very rare exceptions. There is no guarantee that small masses with thin wall and no loculi and solid components are non-malignant or will not undergo malignant changes if ignored. We believe that all post-menopausal women with even minimally enlarged ovaries should have a laparotomy. However, simple cyst in young women may not necessarily be an ominous finding, but if it is not resolved spontaneously or if it persists or if it is presented with other symptoms, treatment must be considered.

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