



DIAGNOSTIC VALUE OF SONOGRAPHY IN OVARIAN DERMOID CYSTS

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ABSTRACT

The dermoid cysts or mature cystic teratoma have various and complex ultrasonographic findings, that is why ultrasonographic diagnosis may be difficult and lead to confusion. In this paper we discuss ultrasonic manifestation of ovarian dermoid cysts. The aim of this study is to present different ultrasonographic finding of ovarian dermoid cysts. Thirty six (36) patients were examined during a period from January 2013 to December 2014 in Al –Khalis General Hospital by using ultrasonic unit type (Sonata Plus) (3.5 MHZ probe) and sometime trans-vaginal probe. The ages of patients range between 21-44 years. All patients sent for the CT scan and Histopathological examination to confirm the diagnosis. Magnetic resonant image (MRI) was not available in our hospital which is non-invasive and non-ionizing image and more preferable for examination women in reproductive periods. All patients have dermoid cysts. Results revealed that 21 patients (58.3%) out of all the patients have Rt. side dermoid cyst, nine patients (25%) have Lt. side dermoid cyst and six patients (16.6%) are undetermined side because of large size of the cyst that occupied most of pelvic & abdominal region. In conclusion: We found that ultrasonic findings is very helpful in diagnosis of dermoid cysts besides the CT scan and MRI examination are more sensitive in uncertain cases because of their high sensitivity for fat and calcium contents of dermoid cysts. We recommend all women with pelvic pain and menstrual disturbances should have ultrasonic examination to exclude ovarian dermoid cysts or other gynecological problems and to prevent the possible complications in the future.

KEYWORDS: Dermoid cyst, Ultrasound, Diagnostic value.

INTRODUCTION

An ovarian dermoid cyst or benign cystic teratoma is a benign tumor descending from germinal cell^[1]. Approximately 80% of the cases occur in young women with 20 to 30 years of age and represent 18-20% of benign ovarian tumors. In most cases, the dermoid cyst is unilateral but it is bilateral in 10-15% of cases^[2,3]. Dermoid cysts can be composed of elements descend from all three of the germinal layers .On histopathological examination , lipid substance, hair, sebaceous secretions, hair follicles, and egg shell calcification are seen in (50% of cases ; real structures (teeth, fragment of bones) in 30% of cases. Frequently, symptoms arise acutely with abdominal & pelvic pain & in 15% of the cases the symptoms are associated with menstrual abnormalities. Torsion is the most common complication, whereas rupture & suppuration are uncommon^[4]. Malignant degeneration occur in (1% to 2%) of cases, usually originated from squamous epithelial cells^[1]. Ultrasound appearance are often characteristic because of their highly reflective dermoid plug (Rokitanski nodule) which is the solid element within the cyst containing hair follicle, sebaceous glands, fat & calcified or ossified elements^[5]. It is usually form an acute angle with the wall of the cyst & can produce acoustic shadowing due to the presence of hair, calcium or bone^[5]. A fluid –fluid level may be detected due to sebum floating on an aqueous, more echogenic lines & dots (dermoid mesh) may be seen in the fluid, caused by strands of hair in the cysts, although fibrinous strand in hemorrhagic cyst can cause this

appearance^[6]. The fibrine threads inside of hemorrhagic cyst could mimic this aspect. But only 1% of cases this finding appears isolated, without being accompanied by other sings characteristic to dermoid cysts^[6]. Tip of iceberg "sign: In some cases only contour of the cyst may be seen because of the distal acoustic shadow. In these circumstances an accurate measurement of the cyst is difficult or impossible to determine. In 16% of cases this sign is the only ultrasonographic manifestation of the dermoid cyst^[6]. There are three types of tissue that can produce acoustic shadowing: calcified structures (bones, teeth), hair conglomerate inside the cyst cavity and fat within sometimes a tendency towards sedimentation occurs with the serous component dermoid cyst & the sebum, producing an ultrasonic visible interface that change position with gravity^[7, 8]. A fluid level within an adnexial mass does not have diagnostic value for dermoid cyst .This finding must be interpreted within the context of other associated criteria^[6].

The echoic "white ball" aspect may occupy sometimes the entire cystic cavity. The histopathological examination of entirely echoic dermoid cysts shows a content containing mainly hair, fat, sebaceous material^[9]. Other times an echoic, relatively homogenous and lobulated mass that fill the part of the cystic cavity is visualized. Not so often within the dermoid cyst may be seen echoic spheres produced by fat material conglomerates that float inside the cyst, they do not present sedimentation^[10,11]. Since1998 Patel et al. described the following ultrasonic features as being specific for dermoid cysts:

- a- The presence of an echogenicity with acoustic shadow.
- B - Diffuse or regional shining echos.
- c- Hyper echoic lines and dots
- d-The presence of a fluid –fluid level.

Patel *et al.*, 1998, demonstrated that about 3/4 of the dermoid cyst show at least two of the above characteristic, while no other adnexal mass presents more than one of these features. So, the presence of two characteristics indicates a positive predictive value of 100% [6]. Mais *et al.* considered that cystic teratoma may be diagnosed through endovaginal ultrasonography with a 99% specificity and 50% sensitivity [12].

CT and MRI are alternative methods in diagnosis of dermoid cysts both of which are more sensitive to fat than ultrasound. At CT a diagnosis of dermoid cysts can be made when attenuation of fat is imaged [2]. At MRI a dermoid cysts can be reliably differentiated from hemorrhagic lesion or endometrioma again due to the intensity of fatty content on imaging [2]. Bekiesinska-Figatowska, *et al.*, described 83% accuracy in diagnosis ovarian lesion on MRI and also highlighted the advantage of this non –invasive and non – radiating form of imaging in younger population of women with suspected pelvic lesion [13]. However, Transvaginal sonographic evaluation using pattern recognition by experienced operators is the optimal approach to the diagnosis of dermoid cysts [14].

Malignant germ cell tumors (dysgerminoma, immature teratomas) occur predominantly in young women (mean age of approximately 20 years). They are usually large solid tumors but typically only stage 1 at presentation .

They are associated with raised levels of various tumors markers *e.g.* (hCG, AFP, CA-125) [15].

METHODOLOGY

This study was carried out during the period from January 2013 to December 2014) in AL-Khalis General Hospital. Thirty six patients with ages ranged between 21- 44 years were enrolled. Ultrasonography was performed by using a hospital type ultrasound unit (Sonata Plus) & (3.5 MHZ probe). In the first step we prepare the patient for examination. The patient must properly fill her urinary bladder before the examination and if Trans vaginal Ultrasonography is used, the patient must empty her bladder. All patients sent for CT scan & histopathological examination to confirm the diagnosis.

RESULT

The total number of patients was thirty six (58.3% of them have Rt. Side dermoid cysts), nine of patients (25% have Lt. side dermoid cysts) and sex patents (16.6% were undetermined the side of the cyst because of very large size of dermoid cysts. Most dermoid cysts (58.3%) were detected in younger age group (20-30 years old) and only 8.3% was detected at the group of 41-50 years old. In our study we find that ultrasonography has a great role in diagnosis of dermoid cysts which have four characteristics features:

- 1-Dermoid plug
- 2-Dermoid mesh
- 3-Tip of the ice berg
- 4- Fat-Fluid level.

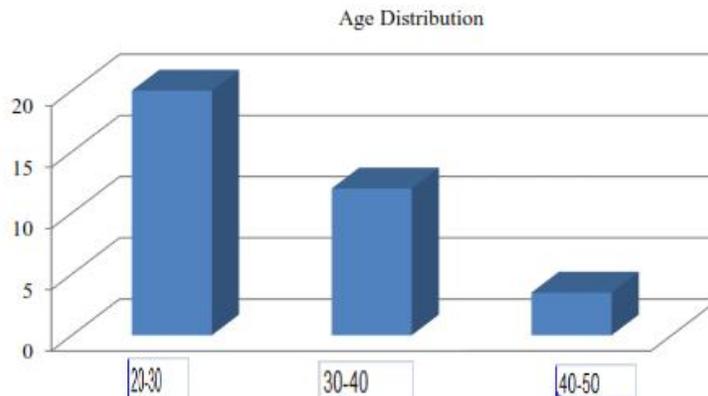
All cases sent for CT scanning & histopathological examination to confirm the diagnosis.

TABLE 1: The Side of Dermoid cyst

The Side of dermoid cyst	NO.	%
Rt. Side	21	58.3
Lt. side	9	25
Undetermined side(very large cyst or un- measurable size)	6	16.6
Total	36	100

TABLE 2: Age Distribution

Age (years)	No.	%
20-30	21	58.3
31-40	12	33.3
41-50	3	8.3
Total	36	100



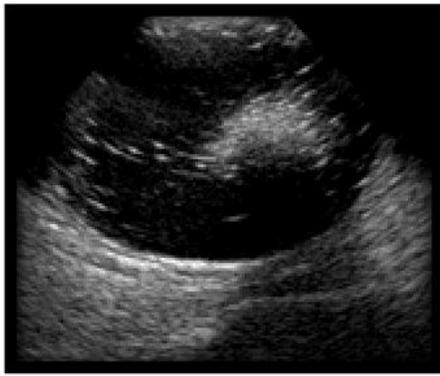


FIGURE 1: Ice berg sign: Adnexal mass typical of a dermoid cyst. A mass made up of (Hair & sebum) casting acoustic shadow within the cyst, (attenuates the sound beam).

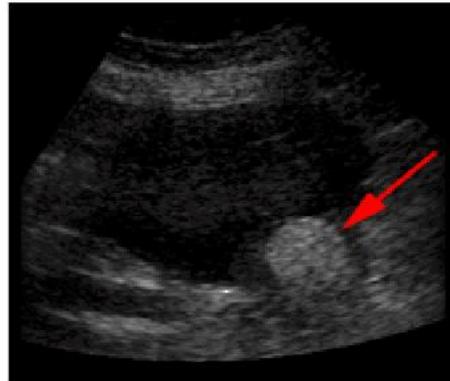
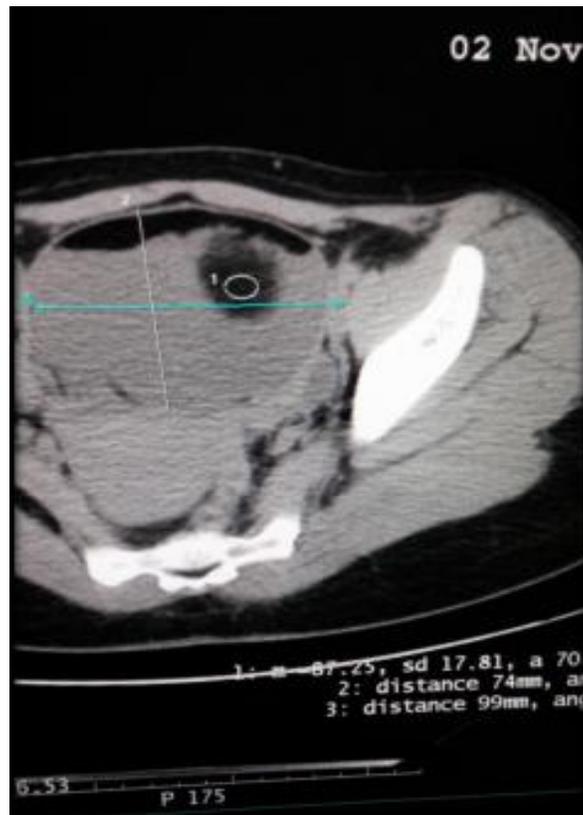


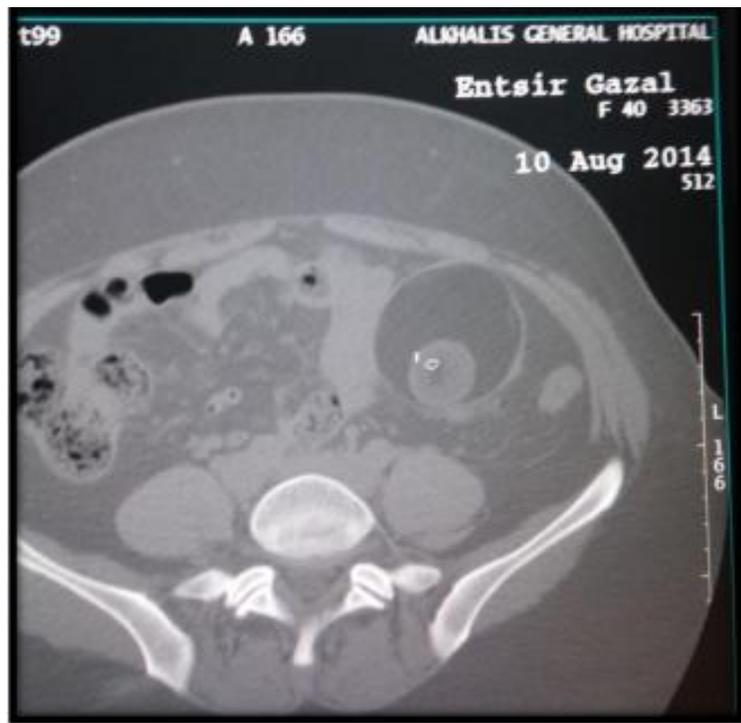
FIGURE 2: Rokitanski nodule containing predominantly sebum, hair & tooth.



FIGURE 3: Fluid-fluid level, due to sebum layered on fluid.



CT scan for a young female (25years old) in Al -Khalis General Hospital, (2nd- november-2014), complaining of abdominal pain & menstrual disturbances , showing a large cyst with fat(-87 HU)/ fluid level , picture typical of dermoid cyst.



CT Scan of pelvic region for a female 40 years old showing a well defined cystic lesion with solid rounded hyper dense mass (-52HU) fat density , picture typically of dermoid cyst.

DISCUSSION

Dermoid cysts or benign cystic teratoma, are a common benign ovarian pathology making up (15- 25%) of ovarian neoplasm. They occur primary in pre- menopausal women between the ages of 10to 30 years. Ultrasound has become a frequently used & highly effective modality through which the diagnosis of dermoid cyst can be made. In this study we find that dermoid cysts detected more in young age group (20-30 years: 58.3%) while only (8.3% :3%) of patients their age between (41- 50 years) which is the same result of other studies^[2,3]. Typically, the diameter of dermoid cysts is less than (10cm) & is rarely more than (15cm), which is the same result of seen in this study; the un measurable size of dermoid cysts is only (6: 16.6%). Dermoid cysts generally contain fluid, fat, & solid tissue. It is this make up that give rise to sonographic features. The presence of 2 or more of these features a diagnosis of dermoid cyst can confidently be made^[6]. A recent study found that 90% of cysts later identified by histopathology as benign dermoid were accurately diagnoses at ultrasound^[16].

Common ultrasonographic features are:

1. Dermoid Plug: This is the most common sonographic features of dermoid cyst. It appear as an echogenic mass within the cyst made up of hair, teeth, or fat^[17].
2. Dermoid Mesh ; as the name imply, the appearance is of multiple small hyper- echoic lines & dots within the cyst forming "mesh like" picture, these echogenic foci are small hair floating in the cystic fluid.
3. Tip of ice berg sign: the appearance of hyper echoic area the base of which cannot be visualized result of amass made up of matted hair and sebum casting an echogenic shadow.

4. Fat –fluid level: also known as “hair –fluid level “or "fluid –fluid level" is believed to be the result of layering of serous fluid & sebum.
5. All these previous findings were detected in this study. Other ultrasonic findings that mimic of dermoid cysts are: (Differential diagnosis).
6. Tubo –Ovarian abscesses: can also contain fluid –fluid levels & echogenic pus & produce acoustic shadowing due to gas.
7. Ectopic pregnancy: also demonstrate shadowing from bones & contain echogenic hemorrhage, which may separate to give fluid –fluid levels. Therefore these conditions can mimic ovarian dermoid cyst sonographically, although the clinical setting should allow for an accurate diagnosis in the majority of these cases^[6].
8. Hemorrhagic cysts: can also cause diagnostic difficulty; however, the echogenic focus produced by fresh hemorrhage displays through transmit ion rather than acoustic shadowing^[17].
9. Dermoid cysts are the most commonly missed ovarian neoplasm on sonography, often due to the "tip of the iceberg" sign , in which the back wall of the echogenic Rokitansky nodule to be misinterpreted as bowel gas^[17].
10. We found that CT scanning & MRI are more sensitive to the presence of fat & calcium than ultrasound, this making the diagnosis using these modalities more straight forward , which is the same finding of other study (Outwater EK). So all cases sent for CT scanning

CONCLUSION

Ultrasonic manifestations of dermoid cysts are highly characteristic & of high diagnostic value. Suspected cases

better sent for CT scanning & MRI examination which are more sensitive & more accurate than ultrasound in diagnosis of dermoid cysts.

RECOMMENDATION

All women with pelvic pain & menstrual disturbances should do ultrasonic examinations to exclude dermoid cysts or other gynecological pathology.

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