



Sonographic spectrum of ovarian dermoid

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OBJECTIVE(S) : To classify ovarian dermoids on the basis of their sonographic appearance.

MATERIAL AND METHOD(S) : Twenty-five ovarian dermoids in 22 patients ranging in age from 18 to 58 years were evaluated with a 3 MHz mechanical and 3.5 MHz convex electronic transducer.

RESULTS : A varied spectrum of sonographic appearances was found which depended on the internal composition of the cyst. According to the composition and sonographic morphology, the scans were classified into four broad groups – Group I – Cystic, Group II – Complex, predominantly cystic mass, Group III – Lesions with hair/fluid level, and Group IV – Solid or predominantly solid appearance.

CONCLUSION(S) : Ovarian dermoids show variegated appearances on sonography.

Key words : ultrasound, ovarian dermoid

Introduction

Germ cell tumors account for 15-20% of ovarian neoplasms with approximately 95% being cystic teratomas¹. Dermoid cysts occur most commonly in reproductive age group. Unlike other germ cell tumors of the ovary, dermoids have a wider age distribution and may be encountered from infancy to old age¹. Since dermoids are composed of tissue elements derived from all three layers with varying degrees of maturity, differentiation, and quantity, the gross pathological changes are extremely variable, bizarre, inconsistent, and unpredictable. This markedly variable internal composition is in turn primarily responsible for the wide spectrum of ultrasound findings in dermoids².

Material and Methods

Twenty-five dermoids in 22 patients were evaluated sonographically. The age of the patients ranged from 18 to

58 years. Ultrasound was performed with a 3 MHz mechanical and 3.5 MHz convex electronic probe. Each patient was examined in longitudinal, transverse and oblique planes. Fifteen patients were asymptomatic at presentation, four presented with the complaint of abdominal mass, one of abnormal uterine bleeding, and two of acute pelvic pain. The 15 asymptomatic patients had no gynecological complaints but were undergoing general abdominal screening by sonography.

Results

A total of 25 dermoid cysts were diagnosed in 22 patients; 19 were unilateral and 3 bilateral. Ten masses were in the right adnexa, eight in the left. Four were predominantly retrouterine, and three predominantly in the region anterior to the uterus and cephalad to the distended urinary bladder.

A varied spectrum of sonographic appearances of dermoid cyst was found. According to the composition and sonographic morphology, the scans were classified into four broad groups.

Group I : Cystic

Two patients had a mass which was completely anechoic with posterior acoustic enhancement. Both the masses were spherical and somewhat irregular in outline.

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Group II : Complex predominately cystic mass

This comprised the most common group of 14 masses. This has been grouped into three subgroups.

1. IIA : Complex cystic mass with internal solid component.

This group comprised of 10 masses with 5 showing a posterior acoustic shadowing. Four of these 5 lesions had a well defined posterior shadowing and one showed a “Tip of Iceberg” appearance (Figure 1).

2. IIB : Complex cystic with solid mural nodule.

Three masses were in this group, two of which showed a completely hyperechoic nodule and one had a predominantly hyperechoic nodule (Figure 2).

3. IIC : Cystic mass with multiple linear hyperechogenic interfaces (“Dermoid Mesh”) (Figure 3).

Only one dermoid cyst of this type was seen. This cyst had internal solid components which were associated with posterior acoustic shadowing.

Group III : Mass with hair / fluid level – “Comet Tail Appearance”

This group comprised of three masses (Figures 4 and 5).

Group IV : Solid or predominantly solid appearing masses

Six lesions showed numerous echoes of varying intensity which gave them a solid or predominantly solid appearance (Figure 6).



Figure 1. Complex cystic mass with internal solid component-Group IIA – “Tip of Iceberg” sign.



Figure 2. Complex cystic mass with solid mural nodule – Group IIB – “Dermoid Plug”.



Figure 3. Complex cystic mass with multiple linear hyperechogenic interfaces – Group IIC – “Dermoid Mesh”.

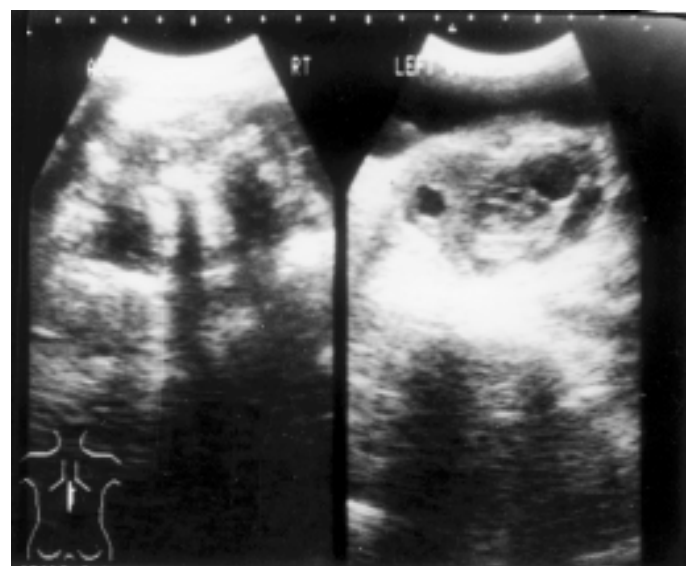


Figure 4. Mass with hair/fluid level – Group III–“Comet tail appearance”.



Figure 5. Mass with fat – fluid level.

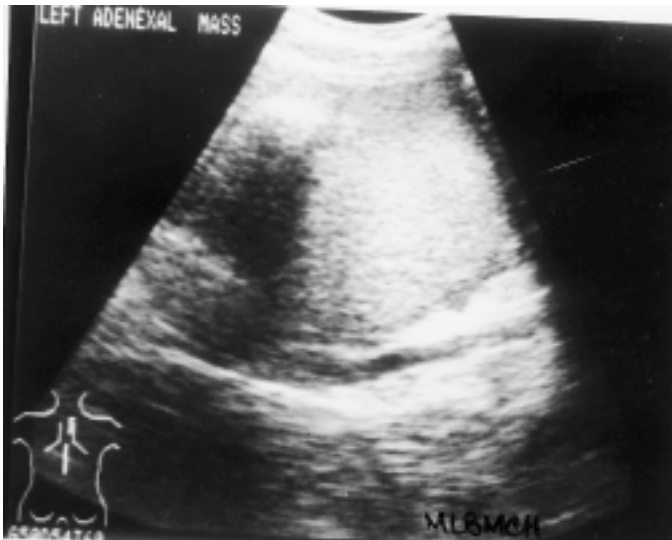


Figure 6. Completely solid mass – Group IV.

Discussion

The sonographic appearance of ovarian dermoids is highly variable ranging from a predominantly solid appearing mass to a predominantly cystic appearing mass ³.

Ultrasound features of ovarian dermoids basically depend upon their overall composition and the echo-characteristic of the individual constituents and their quantities. Pure sebum in dermoid is known to be liquid at body temperature and is anechoic on ultrasound possibly due to homogeneity and lack of internal acoustic interfaces ⁴.



Figure 7. Plain skiagram of the pelvis of the case in figure 6 showing teeth and other ectodermal components.

Teeth, bone and calcification when present produce strong intense echogenicity, with well pronounced distal shadowing ⁵⁻⁷. The shadowing distal to the hair ball is dull, heterogeneous and gradually fades off. A mass of hair floating on the top of sebum or fluid or a mass mostly containing hair, results in a shadow distal to the echogenic hair ball obscuring most of the dermoid except the anterior wall. This has been referred to as “Tip of Iceberg” sign ⁸. (Group IIA; Figure 1).

Dermoid Plug or Rokitansky protuberance as described by Anderson and Kissane ⁹ is an outgrowth from the inner surface of a cyst, containing hair and other atypical tissues (Group IIB; Figure 2). This echogenic mural soft tissue nodule often contains extracutaneous elements making the mass truly tergerminal ¹⁰.

Multiple linear hyperechogenic interfaces may be seen floating within the cyst and have been shown to be hair fibres. This is also considered a specific sign and has been referred to as the “Dermoid Mesh” sign ¹¹ (Group IIC; Figure 3).

Fat-fluid levels and fat-hair fluid levels are seen quite frequently in dermoids and are considered specific and diagnostic signs. Whenever fat is present in adequate amount with sebum or fluid, the echogenic fat tends to float on the top of the anechoic fluid layer due to the inherent low density ¹² (Group III; Figure 4 and 5).

Fat uniformly intermixed with sebum is probably responsible for intense collection of echoes emanating from a dermoid, giving a solid appearance, the intensity being directly proportional to the quantity of fat within ⁴ (Group IV; Figure 6).

These variegated appearances of dermoids seen on sonography have not been reported in previous studies.

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