

Original Research Article

Radiological evaluation of Ovarian Dermoid

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Abstract

Background: Ovarian dermoid cyst is the most common ovarian neoplasm. It accounts for ~15% of all ovarian neoplasms. They tend to be identified in young women, typically around the age of 30 years. These slow-growing tumor contain elements from multiple germ cell layers and are easily detected with ultrasound and much better by CT scan and MRI.

Materials and methods: Patients presented to Radiology department with known case of dermoid cysts of ovary or in whom accidental diagnosis of ovarian dermoid cyst was made eventually. Evaluation of ovarian dermoid with Ultrasound machine (Logiq P9 GE), CT scan Siemens (16 slice) and MRI Philips (1.5 Tim + dot system).

Results: In our study we found that 25 (100%) patients had ovarian dermoid, 20 (80%) patients were of age group 21years to 40 years, 4 (16%) patients were of 41-60 years and 1 (4%) patients were of 0-20 year age group. In diagnosis of ovarian dermoid our results showed that CT scan was more sensitive (96%) than USG (92% sensitivity).

Conclusion: Detection and morphological characterization of ovarian dermoid can be easily done on ultrasound. MRI and CT scan are useful adjunct to USG in its characterization and detection of associated pathology. In USG, when ovary shows heterogeneously hyperechoic lesion with fat fluid level without any vascularity highly suggestive of ovarian dermoid.

Key words

USG, Ovarian dermoid, Cystic teratoma.

Introduction

Dermoid cysts are composed of well - differentiated tissues of at least two of the three types of germinal cells (ectoderm, mesoderm and endoderm). They always contain mature ectodermal tissues (skin, brain), in over 90% of cases they contain mesodermal tissues (muscles, fat, bone, cartilage), and in most cases they also contain endodermal tissues (ciliated, gastrointestinal mucinous or bronchial epithelium, thyroidian tissue) [1].

Ovarian dermoid is classified in 3 types:

1. Mature cystic teratoma
2. Immature teratoma
3. Monodermal teratoma

Mature cystic teratoma is 60% of all ovarian neoplasms occurring in broad age group, more commonly in age group of 20-40 years. It is mostly unilateral but in some patients it may be bilateral also. Patient of mature cystic teratoma are mostly asymptomatic but may present with complain of irregular menses or abdominal pain or nonspecific symptoms. They are slow growing tumors. In management protocol they are only operated when they are more than 6 cm or they may cause major illness to patient [2].

Immature teratomas are rare (less than 1% of all ovarian neoplasms) and involve younger age group (20 years around). They are usually large and serum alfa protein is increased in 50% of patients. They are of malignant behavior, more than 30 % of cases are going to become malignant on follow-up [1].

Monodermoid teratomas are of struma ovarii, neural tumors or carcinoid tumors [1]. They are extremely rare.

Complications of ovarian dermoid are:

- Rupture
- Torsion
- Ovarian vein thrombophlebitis
- Malignant degeneration

Peritonitis occurs as sequel of rupture which is very rare and occurs due to liquefied sebaceous contents of dermoid. Torsion is more common in

pregnancy. Ovarian vein thrombophlebitis occurs due to sepsis and thrombosis in inferior vena cava or renal veins. Malignant degeneration often occurs when patient exceed 70 years of age. Most common malignancy is invasive squamous cell carcinoma [1, 6, 7].

In imaging or radiological evaluation of ovarian dermoid, USG is used as screening modality which is more specific, whereas CT is used as confirmatory modality which is more sensitive. MRI findings can be also correlated with CT findings. In USG calcified materials, echogenic sebaceous material or rokitansky protruberance in ovary are classical findings where as in CT scan fat detection (density less than -20 HU) is diagnostic. Gravity dependent layering with fat-fluid line, palm tree like protrusion are other findings seen in CT scan. In T1 wt imaging, sebaceous material are hyperintense and they are suppressed on T1 wt fat suppression imaging whereas hemorrhagic contents of cyst are not suppressed on T1 wt fat suppression imaging [2, 3, 4, 5].

Aim and objectives

- To evaluate radiological appearance of ovarian dermoid by using noninvasive modalities (USG, CT, MRI).
- Imaging of various appearances of ovarian dermoid by modalities like USG, CT and MRI in early diagnosis and treatment.
- To correlate various findings of USG, CT and MRI.

Materials and methods

Study area

The study was carried out in the Department of Radiodiagnosis, S.B.K.S. Medical Institute and Research Centre, Waghodia, Vadodara.

Study design

Type of the study: An Observational, Descriptive Hospital Based Study.

Sample size: 25 patients.

Selection of subject

Inclusion criteria

- Only those patients who were willing to participate in study were included.
- Already diagnosed cases of ovarian dermoid cysts which need follow up radiological investigations and were referred to our radiology department were included in study. Patients came for investigations for other gynecological diseases (present with complaint of menstrual irregularities and abdominal pain), and were accidentally found to have ovarian dermoid cysts, were included in this study.

Exclusion criteria

- All patients unwilling were excluded from this study.

Study protocol

25 Patients with known case of ovarian dermoid or accidentally found (Where the Patients had presented with symptoms of menstrual irregularities or abdominal pain) were evaluated. All patient in this study of ovarian dermoid had undergone USG (Logiq P9 GE) and CT scan Siemens (16 slice). MRI Philips (1.5 Tim + dot system) were also taken when and where needed after taking informed consent.

Results and Discussion

The present study was carried out at department of radio-diagnosis at S.B.K.S. Medical College and Dhiraj Hospital of 25 Patients with ovarian dermoid were undergone USG and CT .The findings obtained by USG were compared with those of CT scan findings to determine accuracy of modality in diagnosis of ovarian dermoid.

Out of 25 patients, 20 (80%) patients were of age group 21 to 40 years, 4 (16%) patients were of 41-60 years and 1 (4%) patient was of 0 to 20 years (**Table – 1**).

Clinical profile of patient was also compared, in which patient present with their predominant

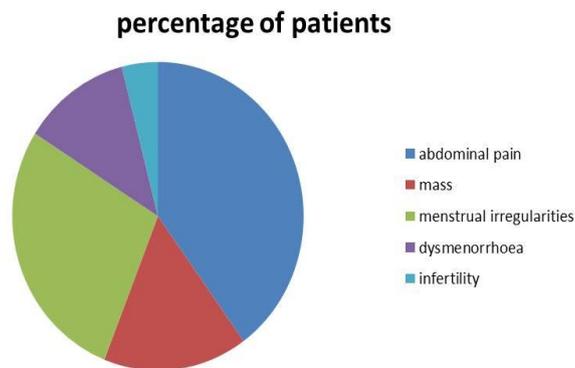
complaint was taken and those complaints were compared with other complaints and chart of this clinical profile was made.

Table – 1: Age distribution.

Age group (years)	Patients	%
0-20	1	4%
21-40	20	80%
41-60	4	16%
0-60	25	100%

In **Figure - 1**, Out of 25 patients, 10 (40%) patients were predominant complaint of abdominal pain, 4 (16%) patients with predominant complaint of mass in abdomen, whereas 7 (28%) patients with predominant complaint of menstrual irregularities, 3 (12%) patients with dysmenorrhoea, whereas 1 (4%) patients with predominant complaint of infertility.

Figure – 1: Percentage of patients.



We also compared the pathological diagnosis of ovarian dermoid with USG and CT scan findings and we concluded as per **Table – 2**.

Out of 25 diagnosed cases of ovarian dermoid, USG can easily diagnosed 23 (92%) patients whereas CT scan can diagnose 24 (96%) patients. So we concluded that CT scan was more sensitive (sensitivity was 96%) to diagnose ovarian dermoid than USG (sensitivity was 92%).

Conclusion

Detection and morphological characterization of ovarian dermoid can be easily done on

ultrasound. CT scan is useful adjunct to USG in its characterization and detection of associated pathology. Fat detection (density less than -20 HU) is more diagnostic of ovarian dermoid on CT scan, whereas calcified materials, echogenic sebaceous material or rokitansky protruberance in ovary are the characteristic USG findings of ovarian dermoid.

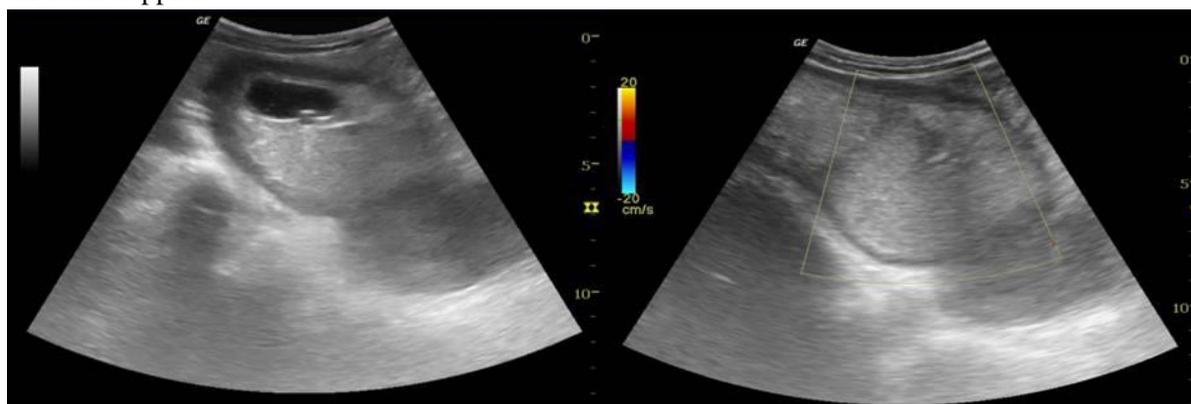
Ovarian dermoid is common among all age groups and very common in women of

reproductive age group. We also conclude that patients of ovarian dermoid came with complaint of abdominal pain predominantly where as other complains (mass, menstrual irregularities, dysmenorrhoea, infertility) are less likely predominant. When we compare results of USG and CT scan with pathological findings, we conclude that CT scan is more sensitive to diagnose ovarian dermoid as compare to USG. In some atypical cases MRI is used for better characterization of ovarian dermoid.

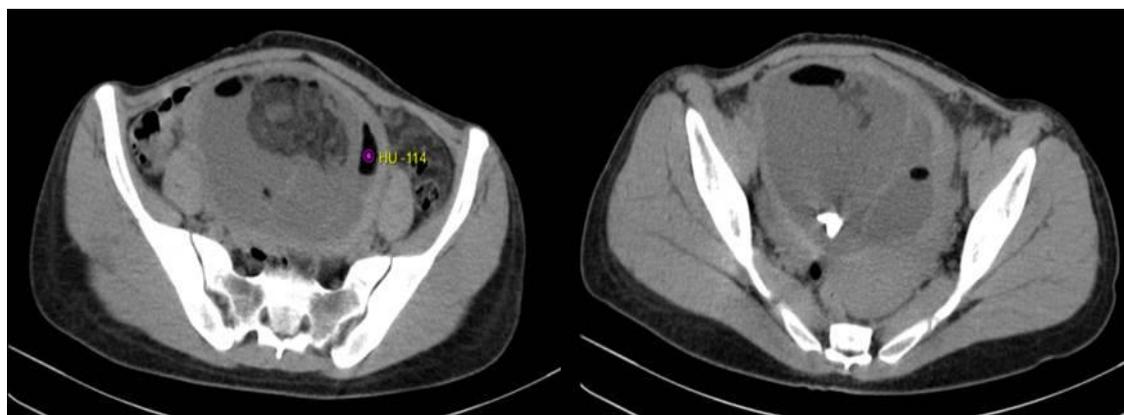
Table – 2: Comparison of ovarian dermoid with USG and CT.

Pathological finding (Ovarian dermoid)	Correctly diagnosed on USG	Correctly diagnosed on CT scan
25 patients	23 patients (92%)	24 patients (96%)

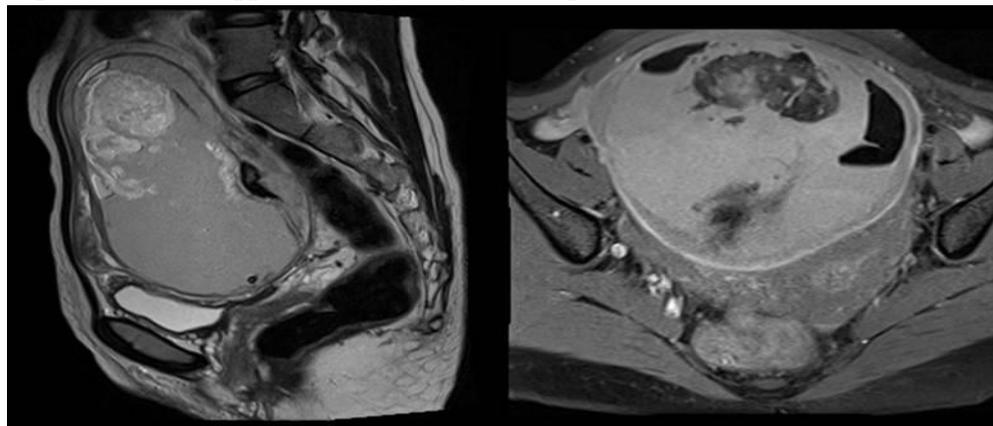
Case – 1: In 29 year old female presented with abdominal pain, Ultrasound showed a well-defined heterogeneously hyperechoic lesion with fat-fluid level within it. The lesion did not show vascularity on color doppler.



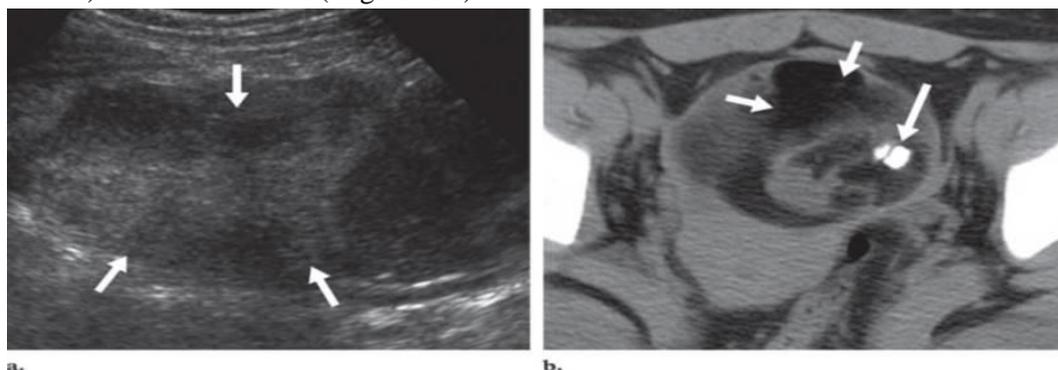
Case – 2: In 32 year old female with complain of menstrual irregularities, plain CT Pelvis axial view showed a well-defined hypodense lesion with internal fat density components and hyperdense calcified foci within it. A hypodense mural nodule and multiple thin septa are noted within the lesion.



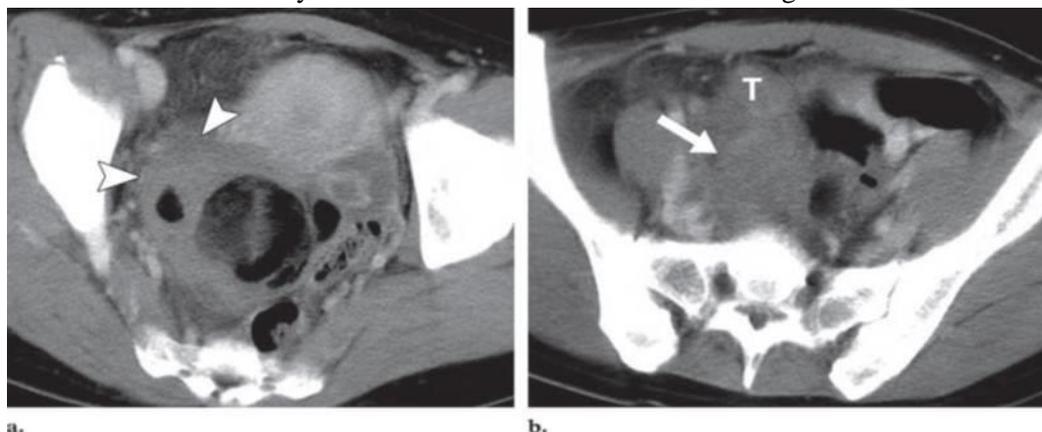
Case – 3: In 24 year old female with complaint of abdominal pain with infertility and diagnosed as ovarian dermoid. On T1W Fat-suppressed image, the areas within the lesion which were appearing hyperintense are suppressed suggesting fat components.



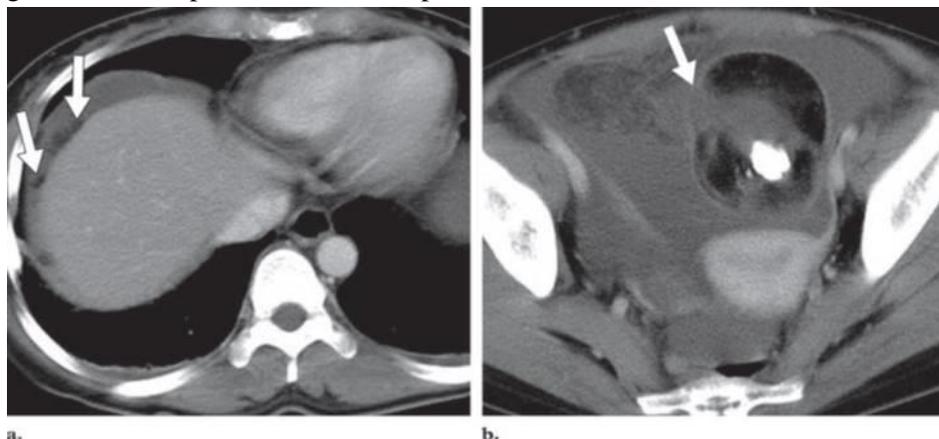
Case – 4: 26 year old female complaining of mass and menstrual irregularity, USG and CT scan done. Mature cystic teratoma of the ovary in a 26-year-old woman. (a) US scan shows a heterogeneous echogenic mass (arrows). (b) Axial unenhanced CT scan shows intratumoral fat (small arrows) and calcifications (large arrow).



Case – 5: In 34 year old women, presented to Dhiraj Hospital with acute abdominal pain and past history of menstrual irregularities and dull aching pain. Torsion of a mature cystic teratoma in a 34-year-old woman. (a) Axial contrast-enhanced CT scan shows a dermoid of the right ovary. Eccentric abnormal wall thickening is noted (arrowheads). Diffuse fat infiltration around the tumor is also noted. (b) Axial contrast-enhanced CT scan obtained at a more cranial level shows a thickened fallopian tube (arrow) and continuation of the tube (*T*) with the mass. Surgical and pathologic results demonstrated a mature cystic teratoma with torsion and hemorrhagic infarction.



Case – 6: Ruptured mature cystic teratoma in a 41-year-old woman. **(a)** Axial contrast-enhanced CT scan shows ascites and floating areas of fat attenuation (arrows) around the liver. **(b)** Axial contrast-enhanced CT scan shows a mature cystic teratoma of the left ovary. Discontinuity of the cyst wall (arrow) with surrounding infiltration is evident. Surgical and pathologic results indicated granulomatous peritonitis due to rupture of the teratoma.



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