CT characteristics of ovarian dysgerminoma

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Abstract  Objective: To study the CT features of ovarian dysgerminoma. Methods: CT findings of 11 cases with pathologically-proved dysgerminoma of ovary were retrospectively analyzed. Results: All the 11 cases were solitary. The maximum diameter of lesion was averagely 17.1 cm. The tumor presented as a solid (n = 8) or cystic-solid (n = 3) mass. After contrast medium administration, the solid component of the lesions showed prominent enhancement on CT scan. Blood vessels were found in 5 masses. Of the 11 cases with ovarian dysgerminoma, invasion of adjacent structure (n = 4), ascites (n = 6) and adenopathy in pelvic wall (n = 3) were demonstrated. Conclusion: Ovarian dysgerminoma has its CT characteristics. Associated with clinic data, CT is helpful in the diagnosis and differential diagnosis of ovarian dysgerminoma.

Key words  ovary; dysgerminoma; tomography, X-ray computed

Ovarian dysgerminoma is an uncommon low-to-moderate-grade malignancy, representing approximate 3.11% of all ovarian malignant tumors [1]. Up to now, the imaging features of ovarian dysgerminoma haven’t been well documented. We retrospectively analyzed the CT data of 11 cases with pathologically-proved dysgerminoma of ovary in order to explore its CT features.

Materials and methods

This paper covered 11 cases of ovarian dysgerminoma that had gone through pathological confirmation in Hunan Provincial Tumor Hospital. All the 11 patients were females with mean age of 21.5 years (ranged, 12 to 40 years). In our cases, the main clinical sign and symptoms included abdominal mass (5 patients), abdomen pain (3 patients), abdomen discomfort (2 patients) or augmentation of abdomen (3 patients). The duration of symptoms ranged from 5 days to 8 months. All the ovarian lesions were solitary.

Among these tumors 5 located at right ovary and 6 at left. Serum LDH level of 8 patients was elevated. Six cases showed elevation of AKP level. AFP, CA125 and β-HCG level were high each in one patient.

Transverse pelvic CT scan with 10 mm thickness and 10 mm apart was performed on a helical CT scanner (GE Hispeed-FX/i or Siemens Emotion 6). After plain CT scan, enhancement CT images were obtained after intravenous injection of iohexol (1.5 mL/kg body weight).

Results

In our 11 cases, 6 tumors were oval and 5 were irregular or lobulate. The maximum diameter of ovarian dysgerminoma ranged from 6 to 28 cm with an average diameter of 17.1 cm. Among them, the number of tumors less than 10 cm large, between 10 cm and 20 cm or between 20 cm and 30 cm was 1, 5 and 5 respectively. Eight tumors presented as solid masses with or without patchy low-density area which had no enhancement on enhanced CT scan. Blood vessels were found in 5 masses. Of the 11 cases with ovarian dysgerminoma, invasion of adjacent structure (n = 4), ascites (n = 6) and adenopathy in pelvic wall (n = 3) were demonstrated.

Discussion

Ovary dysgerminoma originates from the primitive germ cell before sexual differentiation. It is the second
This disease has a predilection for children, adolescence and pregnant female. About 75 percent of ovary dysgerminomas occur during the 1st to 3rd decades of life. Dysgerminoma often arises from unilateral ovary. Bilateral involvement is seen in 5%–15% of all cases [2].

Histologically, dysgerminoma includes pure form and mixed form. Pure dysgerminoma is not associated with endocrine hormone secretion. Coexisting chorioepithelioma or yolk sac tumor, the mixed form of dysgerminoma may show elevation of either serum AFP or HCG level. The majority of patients with ovary dysgerminoma show nonspecific elevation of serum LDH and AKP level which can help establish the diagnosis.

Ovarian dysgerminoma generally presents as a solitary oval or lobulated mass. This lesion is always large with an average diameter larger than 10 cm. In this study, the maximum diameter of tumor was 17.1 cm averagely. In literature and our study, ovarian dysgerminoma was usually solid [3,4]. Areas of necrosis and hemorrhage presenting as low-density shadow without enhancement on enhanced CT scan are usually observed. The area without necrosis often shows obvious enhancement after intravenous contrast medium injection on CT scan. Less commonly, the tumor becomes a cystic-solid mass because of marked necrosis. In our cases, there were three cystic-solid dysgerminomas. On rare occurrences dysgerminoma is completely cystic [5]. Macropathology, the tumor has fibrovascular septa and capsulary. The internal septa were found to enhance during arterial phase on enhanced CT scan in Tanoak’s study [4]. In our study, plain and enhanced CT scan didn’t show septa in all the 11 tumors. It may be attributable to the extremely thin septa which are similar in density and enhancement degree to the solid component of tumor. Another cause may be that the CT imaging data in our study weren’t obtained during arterial phase. On MRI, the septa were characteristically hypointense on T1-weighted and T2-weighted imaging because of fibrous tissue in the mass [5,6]. Calcification is an uncommon CT sign of this lesion.

Direct extension and lymphatic metastasis are the mainly invasive mode of ovary dysgerminoma [1,2]. In our report, invasion of uterus, bladder and iliac vessels was found in four cases and adenopathy in three cases. Ascites was observed in about half of our cases. It indicated that ascites which is usually mild is common in this disease.

Ovary dysgerminoma should be differentiated from non-ovarian malignant tumors, epithelial malignancy and other germ cell tumors in ovary. Epithelial cystadenocarcinoma, the most common tumor of ovary, often appearances as a cystic-solid mass without envelope. Typically occurring in the 4th to 6th decades of life, about twenty-five to fifty percent of ovary cystadenocarcinomas are bilateral. Calcification, peritoneal pseudo-myxomas, marked elevation of serum CA125 level are often found in this disease. Oval metastasis usually has history of breast cancer or carcinoma of digestive tract. Ovarian yolk sac tumor, another germ cell tumor, usually demonstrates perforation of capsule, peritoneal implants and elevated serum AFP level [6]. Malignant degeneration of mature cystic teratomas and immature teratomas are characterized by foci of fat and scattered calcifications.