Case 4836

Malignant Teratoma With Multiple Peritoneal and Pleural Implants
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Authors: Sophie Boddington, Heike E Daldrup-Link, Derk Purcell, Elizabeth Sutton. Department of Radiology, Pediatric Radiology Section University of California in San Francisco 505 Parnassus Ave San Francisco CA 94143-0628 Ph. 415-476-4328 Fax 415-476-0616
Patient: 18 years, female

Clinical History:

Large mass in the pelvis of an 18 year old female, with cystic and solid components and calcifications. The mass involved both ovaries and was associated with multiple peritoneal and pleural implants. A biopsy showed an immature teratoma, which contained a malignant endodermal sinus tumor.

Imaging Findings:

An 18 year old patient was admitted to the hospital with nausea, abdominal pain, a palpable pelvic mass and elevated alpha-fetoprotein on serum analyses. US and CT scans showed a large, partly cystic and partly solid mass in the pelvis, involving both ovaries. In addition, multiple solid masses with stippled calcifications were noted in the abdominal cavity, around the liver, in the mesentery, behind the spleen as well as in the thorax, along the pleura and in the anterior mediastinum (Fig. 1-6). A biopsy showed a teratoma, which apparently originated from the ovary. The teratoma contained both mature and immature components, as well as a malignant endodermal sinus tumor. The patient underwent partial resection and chemotherapy for the endodermal sinus components of her tumor. Posttherapeutic residual masses did not change in size or configuration for two years after this treatment. But more recent follow up CT exams showed, that the pelvic masses slightly increased in size over time, although the patient has been completely asymptomatic for years.

Discussion:

Teratomas are tumors, which originate from all three germ cell layers (ectoderm, mesoderm and endoderm). Most are due to abnormal differentiation of fetal germ cells that arise from the fetal yolk sac. The cells that make-up these tumors are unique in that they have the potential to differentiate into any tissue type, including hair follicles, nerves and ganglia, or bone. Most frequent sites of origin are the sacrococcygeal region (57%) and the gonads (29%). Teratomas are the most common ovarian neoplasm in premenarchal and adolescent girls. They may be divided into mature and immature; immature teratomas may be benign or malignant [2]. The most prevalent type of teratoma is the mature teratoma. This tumor may be cystic or solid, is usually confined to the organ of origin and is commonly diagnosed with US. Occurring much less frequently is the immature teratoma (2% of ovarian tumors), which is diagnosed pathologically based on the presence of immature neuroectodermal elements within the tumor. The degree of immaturity is linked to the potential for recurrence, metastasis and overall survival [2]. Immature teratomas may contain malignant tumor components, most often endodermal sinus tumor. The endodermal sinus tumor is associated with an elevated AFP, which is used as a tumor marker and indicator of therapy response or tumor recurrence [2]. Imaging Studies: Mature teratomas may be purely cystic, partly cystic and solid or purely solid. Fat
attenuation of the cysts or foci of fat within solid tumors are diagnostic. The mass may also contain areas of calcifications. Immature teratomas are typically larger (14-25 cm) than mature cystic teratomas (average, 7 cm) at initial manifestation. They are less frequently purely cystic. Immature teratomas may be solid or have a prominent solid component with cystic elements. They are usually inhomogenous and ill defined. Foci of fat are found in almost all lesions. Punctate calcifications are also often seen. The cystic areas are usually filled with serous or mucinous fluid. Fatty sebaceous fluid is seen in only few cases. The tumors frequently demonstrate perforation of the capsule. Ascites may be present as well. The tumors may metastasize, as shown in this case. The risk of a malignant transformation increases with age of the patient. Ovarian tumors are associated with an array of symptoms ranging from non-specific abdominal pain, to bloating, urinary urgency, irregular menses, vomiting and nausea [4]. Conversely, an ovarian tumor may be associated with an asymptomatic mass. This wide range of clinical symptoms suggests that abdominal palpation and rectal examination be performed on any girl with non-specific abdominal pain [5]. Although the presenting clinical symptoms provide preliminary information as to the size and location of the tumor, in order to make a differential diagnosis one must also take into account the information provided from different imaging techniques, the age of the patient and the stage (defined by the International Federation of Gynecologists and Obstetricians). Certain types of ovarian neoplasms do secrete hormones and so checking for abnormalities in tumor markers and hormone levels can be helpful [5]. It must be emphasized that histological examination is the only real proof when considering the possibility of malignancy [5]. Treatment of malignant ovarian tumors requires surgery in parallel with chemotherapy. Surgery requires the abdomen to be thoroughly explored with particular emphasis on conserving fertility and normal sexual function [3]. It is widely accepted that imaging follow-ups and clinical examination are preformed every three months for two years, every six months for three years, and then yearly for ten years when the tumor is malignant and five years when the tumor is benign [3].

**Differential Diagnosis List:** Malignant germ cell tumor with multiple peritoneal and mediastinal implants.

**Final Diagnosis:** Malignant germ cell tumor with multiple peritoneal and mediastinal implants.

**References:**


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Marc R. Laufer, MD, Donald Peter Goldstein, MD. Ovarian cysts and neoplasms in infants, children, and adolescents. In UpToDate; Rose, BD (ed), UpToDate, Waltham, MA, 2006.
Description: CT scan with sagittal reconstruction after oral and i.v. contrast medium administration shows a partly cystic and partly solid mass in the pelvis with stippled calcifications. Additional solid lesions with stippled calcifications are seen behind the liver and behind the heart. Origin:
Figure 2

Description: Axial CT scan of the primary tumor in the pelvis after i.v. contrast medium administration shows the solid mass in the posterior aspect of the pelvis with stippled calcifications. The mass is located behind the left adnexae and the uterus, it pushes the uterus anteriorly and the rectum to the right. A small component of this mass is also located anteriorly of the left adnexae. Origin:
Description: CT scan with coronal reconstruction after oral and i.v. contrast medium administration shows the solid mass in the pelvis with stippled calcifications. Additional solid lesions with stippled calcifications are seen above the spleen and a solid mass is noted around the liver. Origin:
Description: CT scan with coronal reconstruction after oral and i.v. contrast medium administration shows the partly cystic and partly solid mass in the pelvis, above and below the uterus. Additional solid lesions with stippled calcifications are seen around the liver, below the left hemidiaphragm, in the mesentery and in the lower mediastinum, to the left of the aorta. Origin:
Description: Axial CT scan after i.v. contrast medium administration through the lower chest / upper abdomen shows metastases around the liver and in the lower mediastinum. Origin: