Immature Teratoma with Somatic Tumor-Type Sarcoma: A Case Report

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ABSTRACT
Teratoma is a germ cell tumor seen mainly in neonates and young adults; it contains elements derived from all three germinal layers, with its usual site of occurrence being the ovary and testis and less common sites being several extragonadal locations. This case is of a 10-year-old boy who presented with an asymptomatic mass, heterogeneous on ultrasonography and showing enhanced solid areas along with nonenhancing cystic areas on contrast enhanced computed tomography. Cytological diagnosis of malignant mesenchymal tumor was made; however, exact categorization could not be done. After surgical excision, histological and immunohistochemical studies yielded the diagnosis of immature teratoma with somatic malignancy – sarcoma. Teratomas with malignant transformation refer to a form of germ cell tumor in which a somatic teratomatous component becomes morphologically malignant and develops aggressively. These are associated with chromosomal abnormalities i (12p) reflecting germ cell tumor clonality. The occurrence of an identifiable sarcomatous component is a well recognized but distinctly uncommon phenomenon.

Keywords: Teratoma, contrast enhanced computed tomography, malignant mesenchymal tumor, malignant transformation, chromosomal abnormalities

CASE REPORT
A 10-year-old boy presented with a asymptomatic mass. Ultrasonography revealed a heterogenous mass measuring 29 × 19 × 10 cm with extensive necrotic, calcified, and gross solid components, displacing liver and kidney (Fig. 1). Contrast enhanced computed tomography (CECT) was done that showed enhancing solid areas along with nonenhancing cystic areas with minimal stippled calcification. No definite fat attenuation was seen. All blood investigations were within normal limits. On fine needle aspiration cytology (FNAC), a diagnosis of malignant mesenchymal tumor was made (Fig. 2); however, exact categorization could not be done. Ascitic fluid examination showed smears positive for malignant cells (Fig. 3). On gross examination, the mass was irregular and encapsulated. The cut surface was variegated, solid, fleshy, gray tan with few cystic areas along with hemorrhage and necrosis (Fig. 4), a finding consistent with the attenuation and signal intensity seen in CECT.5 One pole of the tumor showed well-demarcated hematoma. On microscopic examination, smears showed highly cellular tumor with necrotic areas along with hemorrhage and necrosis (Fig. 4), a finding consistent with the attenuation and signal intensity seen in CECT.5 One pole of the tumor showed well-demarcated hematoma. On microscopic examination, smears showed highly cellular tumor with necrotic areas. Cellular areas were composed of immature tissue mainly neuroectodermal arranged in sheets and focal rosetting. Mature cartilage and glandular structures were also seen (Figs. 5-7). The other component in the tumor was composed of plump to spindle-shaped cells arranged in sheets and interlacing fascicles, showing marked cellular and nuclear pleomorphism along with binucleation and abnormal mitosis (Fig. 8). Adrenal tissue showing extensive hemorrhage was identified.
**Figure 1.** Abdominal CECT revealing a well-circumscribed heterogenous mass showing enhanced solid areas and non-enhanced cystic areas, displacing liver and kidney.

**Figure 2.** FNAC smear showing scattered singly lying malignant tumor cells with oval nuclei, coarse chromatin, and abundant gray-blue cytoplasm (aspiration cytology, Giemsa, 400×).

**Figure 3.** Ascitic fluid showing positivity for malignant cells (fluid cytology, Giemsa, 400×).

**Figure 4.** Cut section of the gross specimen showing variegated appearance composed of solid fleshy areas predominantly with few cystic areas, hemorrhage, and necrotic.

**Figure 5.** Tumor showing foci of mature cartilage tissue adjacent to undifferentiated tumor cells (H&E, 100×).
Figure 6. Focal areas of glial tissue identified (H&E, 100×).

Figure 7. Photomicrograph showing epithelial component forming glandular structures (H&E, 100×).

Figure 8. Pleomorphic sarcomatous areas with tumor cells arranged in sheets; also seen is abnormal mitosis (H&E, 400×).

Figure 9. Tumor cells showing vimentin positivity in the sarcomatous component throughout on IHC (400×).

Figure 10. Immunohistochemistry showing focal NSE positivity (400×).

Figure 11. Immunohistochemistry showing focal S-100 positivity (400×).
Immunohistochemistry (IHC) markers put for the case were vimentin (positive), neuron-specific enolase (NSE), S-100 (focal positivity), desmin, and smooth muscle actin (negative), thus giving a diagnosis as immature teratoma with somatic malignancy – sarcoma (Figs. 9-11).

**DISCUSSION**

Retroperitoneal teratomas are rare entities, representing only 1%–11% of all primary retroperitoneal tumors. Incidence is bimodal with peaks in the first six months of life and in early adulthood. Due to their location, they are usually identified only after they have grown to huge proportions. Teratomas (both mature and immature, sometimes referred to as grade 0 and grade 1 teratomas) have a risk of malignancy, the frequency being more in case of immature ones. Teratoma with malignant transformation refers to a form of germ cell tumor in which a somatic teratomatous component becomes morphologically malignant such as carcinoma, sarcoma, neuroendocrine, and leukemias, and develops aggressive growth. Sarcoma developing in a retroperitoneal teratoma tends to develop massive cystic degeneration, thus exhibiting central necrosis more commonly than other sarcomas, whereas fat and calcification are not typically present. These are associated with chromosomal abnormalities i(12p) reflecting germ cell tumor clonality. The occurrence of an identifiable sarcomatous component is a well-recognized but distinctly uncommon phenomenon, contributing to about 4.34% of retroperitoneal teratomas with malignant components.

**REFERENCES**


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**Red Meat Consumption Linked to Increased Risk of Early Death**

A study from the Harvard School of Public Health and published in the *Archives of Internal Medicine* has linked red meat to a higher risk of early death. Eating red meat — any amount and any type — appears to significantly increase the risk of premature death, according to the study.

The researchers found that those who increased consumption of unprocessed red meat by one serving each day had an 18% higher risk of dying from heart disease and a 10% greater risk of dying from cancer, while those who ate one more daily serving of processed red meat had a 21% higher risk of dying from heart disease and a 16% increased risk of dying from cancer.

The increased risks linked to processed meat, like bacon, were even greater: 20% overall, 21% for cardiovascular disease, and 16% for cancer.

The researchers estimated that substituting one daily serving of red meat with fish, poultry, nuts, legumes, whole grains, or low-fat dairy products would reduce the risk of dying in this stage of life by 7%–19%.

If people ate less than half a serving of red meat a day, deaths during the 28 years of follow-up could have been reduced by 9.3% for men and 7.6% for women.

About 3 years ago, a study by the National Cancer Institute found that people who ate the equivalent of a quarter-pound burger or small steak each day had about a 30% greater risk of dying over 10 years than people who only ate red meat occasionally.