Tumor masses and other malignancy problems in children presenting acutely in the emergency room

Leonard E. Swischuk

Abstract Most often tumor and malignancy-related problems present in an indolent fashion. However, every so often an occult tumor can present as an acute problem. This can happen with the chest (pain, respiratory distress), abdomen (pain, distention), and extremities (pain, swelling, limping, paralysis). Examples of such occurrences are presented in this communication. The objective is to familiarize emergency room physicians and radiologists with these potentially misleading clinical presentations.

Key words Emergency – Tumors – Children

Most often tumor and malignancy-related problems tend to present in an indolent, creeping fashion. However, in some cases, the presentation may be more acute. This is not to say that the tumor, for some reason, begins to grow rapidly but rather that some complicating problem has arisen and results in the more acute symptoms. This could be bleeding into the tumor, compromise of the airway, or extremity involvement. In addition, some malignancies can present as acute abdominal problems.

Abdominal tumors

Abdominal tumors may present with pain, abdominal distention, or feeding problems. We encountered one patient who came to the emergency room because of vomiting and weight loss. The initial films demonstrated a paraspinal mass (Fig. 4 A) and clinically an abdominal mass was suspected. The patient eventually was determined to have neuroblastoma (Fig. 4 B). Lymphoma also can present in a similar fashion, and the paraspinal extension of both tumors has been shown to be highly suggestive of the two problems [4]. Ovarian teratomas, on the other hand, can be silent until they become very large. If typical irregular flaky calcifications are seen in the mass [5], the diagnosis of malignancy can be suggested with confidence (Fig. 5).

Chest tumors

One of the more common acute problems encountered with chest masses is respiratory distress. This results from compression of the airway by large masses, and for the most part one is usually dealing with mediastinal teratoma–germinomas, leukemia, or lymphoma. In the latter cases the problem often is massive infiltration of the thymus gland [1, 2, 3], but when any of these patients present, the tumors usually are very large and not difficult to identify on the chest X-ray (Fig. 1). Germinomas, especially more malignant ones, can undergo internal bleeding, leading to rapid increase in size and acute respiratory distress and chest pain (Fig. 2). More indolent teratomas may present with what at first appears to be an empyema or pleural effusion. If typical calcifications are seen in these cases the diagnosis can be suggested from the onset (Fig. 3).

Acute extremity problems and underlying malignancy

Underlying malignancy involving the extremities may be the result of primary or secondary tumors and very often first manifests in the hip. The reason for this is that the hip is a weight bearing joint and thus understandably is one of the first joints to become symptomatic. Of course, other bones also can be involved, but in all cases secondary malignancy and leukemia are much more common than primary tumors. The most common secondary malignancy is neuroblastoma. All of these conditions present with variable destruction of the involved bone (Fig. 6).
Fig. 1 A–C Mediastinal mass. A Note the large mediastinal mass blending with the cardiac silhouette. B Lateral view demonstrates marked posterior displacement of the heart (arrows) by the large anterior mediastinal mass. C Axial CT study demonstrates a heterogeneous, large anterior mediastinal mass (arrows). This was a lymphoma infiltrating the thymus gland.

Fig. 2 A–D Rapidly growing germ cell tumor. A Note the predominantly left-sided mediastinal mass (arrows). B Lateral view demonstrates that the mass is located in the anterior superior mediastinum (arrows). C Twenty-four hours later the size of the mass has increased and now there is fluid in the pleural space (arrows). This patient had respiratory distress, weakness, and generalized malaise. D Coronal MR image, T1 image demonstrates the large mass (arrows); the tortuous low-signal (black) structure represents a feeding artery. The high signal, amorphous area represents bleeding. This very vascular tumor resulted in bleeding into the tumor and into the pleural space.