

Surgical Treatment in Intrathoracic Tumors in Children

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Abstract: Intrathoracic tumors in children are uncommon surgical conditions. The tumor usually confines in mediastinum and the most common mediastinal tumor pathological finding is neurogenic in origin.

From July 1982 to March 1993, 702 cases underwent thoracic operations of the lungs, pleura and mediastinum (excluding cardiac and esophageal operations) in the Cardiovascular and Thoracic Surgical Unit, Department of Surgery, Faculty of Medicine, Khon Kaen University. There were 24 cases (3.4% of all thoracic operations) under the age of 15 years who were diagnosed as having intrathoracic tumor but only the records 18 patients were available for review. Of these 18 cases, there were 11 males and 7 females and their ages were between one month and 14 years. Most common presenting symptom was dyspnea. Investigations for diagnosis were chest x-ray and CT scan. Operations were median sternotomy with tumor removal 9 cases, thoracotomy with lung resection 5 cases, and mediastinotomy with biopsy 5 cases. Pathological diagnoses were teratoma 7, lymphoma 3, neurogenic tumor 2, lung cyst 2, thymoma 1, retrosternal thyroid 5, lung bleb 1 and embryonic cell tumor 1. There was no mortality from surgery among these patients.

Key Word: *Mediastinal Tumor, Intrathoracic Tumor*

Intrathoracic tumors in children are uncommon surgical conditions. Primary intrathoracic tumors, although relatively rare in the pediatric population, pose an important and challenging diagnostic and therapeutic problems. They confine primarily in the mediastinum. They represent a heterogeneous group of congenital and neoplastic lesions, the majority of which are solid tumors and indeed, may be life threatening. The most common cause of mediastinal tumor in children has been reported to be neurogenic in origin which had been published in world wide literature or standard textbook.⁵

In Thailand, there were a few reports about this condition in Thai children. So that this paper reporting such a series, we desired in especial to review the pediatric patients who were diagnosed as having intrathoracic tumors, their presentations, pathological diagnosis and treatments in Srinagarind Hospital.

Patients and Methods

From July 1982 to March 1993, there were a total of 702 patients of all ages evaluated and treated for intrathoracic tumors at Srinagarind Hospital. This retrospective study was made by reviewing the records of pediatric patients (15 years of age or less) who were diagnosed as having intrathoracic tumors. We focused on the age, clinical presentations, diagnostic modalities, operations and pathological diagnosis.

Results

There were 24 cases of intrathoracic tumors in children (3.42% of all intrathoracic conditions). Only the records of 18 patients were available for complete review. Of these, 11 were males and 7 were females.

Their mean age was 9.6 years (ranging from one month to 14 years) (Fig.1 and Table 1).

Location of Tumors

Fourteen patients (78%) had a mediastinal mass. The majority of masses confined in anterior mediastinum. In three cases, the masses were in the lungs (Table 1).

Clinical Manifestations

In these report of 18 patients, some presented with multiple complaints. The most common symptom involved the respiratory system such as dyspnea (12 in 18, Table 2). The youngest patient (age 1 month) presented with recurrent pneumonia.

Diagnostic Modalities

The presence of mediastinal mass by chest x-ray (posteroanterior and lateral films) was noted in every case. Three cases had CT scan of the chest to define the exact anatomical location of the tumor and the extent of involvement of vital structures which aided in determining resectability.

Treatments (Table 1)

The goals of surgical treatment are for diagnosis and complete excision. There were 7 cases of median sternotomy and tumor removal, 5 cases of thoracotomy with lung resection. Four cases had mediastinotomy with biopsy. One case had thymectomy. Three cases of lymphoma had postoperative radiation and chemotherapy.

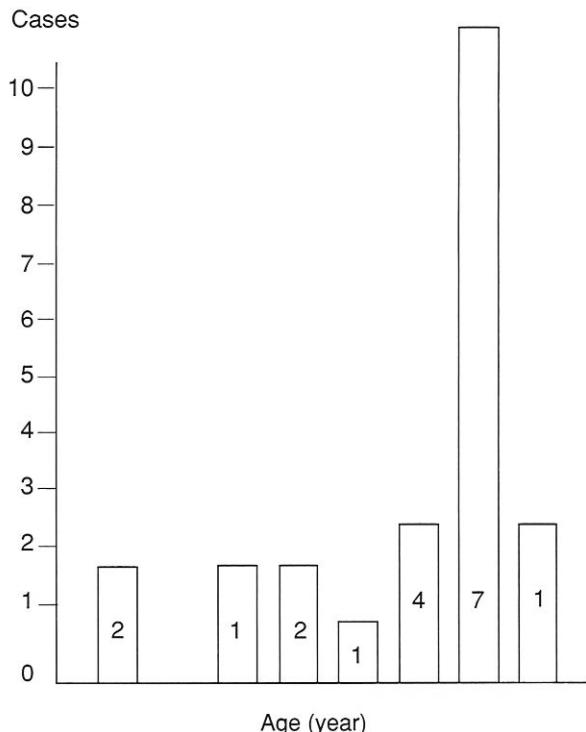


Fig. 1 Distribution of patients by age (year) (n=18)

Table 2 Presenting Symptom (n=18)

Symptom	cases
dyspnea	9
fever+dyspnea	3
chest discomfort	1
fever	1
chronic cough	1
muscle weakness	1
chest wall deformity	1
Honor's syndrome	1

There was no mortality from surgery among these patients.

Pathological Diagnosis

Benign tumors made up the majority of intrathoracic tumors (67%). The most common pathological findings were teratomas (7 cases) and all were benign. The other benign conditions were 2 lung blebs, one each of lung cyst, thymoma, substernal thyroid and embryonic cell tumor.

Table 1 Patients' Demographic Data

No.	Age (Year)	Symptoms	Location	Pathology	Operation
1	11	dyspnea	anterior mediastinum	teratoma	median sternotomy with excision
2	13	dyspnea	anterior mediastinum	teratoma	median sternotomy with excision
3	11	chest deformity	anterior mediastinum	teratoma	median sternotomy with excision
4	11	dyspnea	anterior mediastinum	teratoma	median sternotomy with excision
5	13	dyspnea + fever	lung	teratoma	thoracotomy with excision
6	13	dyspnea	anterior mediastinum	teratoma	median sternotomy with excision
7	14	cough	anterior mediastinum	teratoma	median sternotomy with excision
8	7	dyspnea	anterior	lymphoma	median sternotomy with biopsy
9	10	fever	anterior mediastinum	lymphoma	median sternotomy with biopsy
10	13	dyspnea	anterior mediastinum	lymphoma	median sternotomy with biopsy
11	1/12	fever	posterior mediastinum	neuroblastoma	thoracotomy with excision
12	8	Honor's syndrome	posterior mediastinum	neuroblastoma	thoracotomy with excision
13	6	dyspnea + fever	lung	lung cyst	thoracotomy + RML lobectomy
14	12	dyspnea	lung	lung cyst	thoracotomy + LLL lobectomy
15	8/12	fever + dyspnea	lung	lung bleb	thoracotomy + RUL lobectomy
16	12	dyspnea	anterior mediastinum	thyroid cyst	median sternotomy with excision
17	13	muscle weakness	anterior mediastinum	thymoma	thymectomy
18	4	dyspnea	anterior mediastinum	embryonal cell	mediastinotomy with biopsy

Malignant tumors were 3 lymphomas (all non Hodgkin's lymphoma) and 2 neuroblastomas (Table 1)

Discussion

Intrathoracic tumors in children (less than 15 years of age) are relatively rare. Michael King¹ et al reported their series in 1982. They reviewed patients

who were less than 19 years old between 1950 and 1980 and pointed out that malignant tumors were the most frequently observed (136 of 188 patients) mediastinal masses in their series. Ravitch² et al emphasized the most commonly observed mediastinal mass was neurogenic in origin. However, King et al¹, Elder et al³ and Bradly et al⁴ pointed out that lymphoma was the most commonly occurring mediastinal mass (46%)

and also the most common malignant mediastinal tumor (63%). To the opposite we found that benign tumor was the most common mediastinal mass in pediatric patient (67%).

The common presenting symptom is respiratory symptom. If children were 2 years old or more, they usually presented with dyspnea and chest discomfort. Children under 2 years of age tends to present with problem of infection. Our one month old youngest patient was brought to the hospital with recurrent pneumonia and was found to have neuroblastoma.

Chest x-ray remains the simplest and most valuable diagnostic modality to diagnose this condition. All of patient were diagnosed by chest x-rays. Only 3 patients, CT scans of the chest were done to define exact anatomical extent of the lesions. In cases of suspected enterogenous bronchogenic cysts, the addition of esophagogram may also be of value.

Regardless of pathological diagnosis, the treatment of choice, however, remains surgery because we can obtain diagnosis and totally excise the mass. Nevertheless, if the patients can't be cured, his symptoms can be relieved by surgery. Although some tumors

such as lymphoma can be treated effectively by radiation or chemotherapy, their definitive diagnoses are usually made after surgery.

In summary, intrathoracic tumors in children are relatively rare but still being a challenging condition. Surgical treatment remains to be of value and the treatment of choice for intrathoracic tumors in children.

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