TERATOMA OF THE THYMUS IN A CHILD

By M. Yusoff Dawood*

INTRODUCTION

Tumours of the mediastinum in children are not uncommon. One-third of mediastinal tumours occur in children (I. L. Heinburger *et al*, 1965). Tumours of the thymus, however, constitute only 10% of mediastinal tumours (A. Ochsner *et al*, 1966) and are thus the fourth commonest tumour in the mediastinum (T. W. Shields *et al*, 1966). We would like to report a case of a teratoma of the thymus in an infant.

CASE REPORT

L.C.H., a 17-month-old male Chinese baby was admitted to the Paediatric Unit on 24.9.68 with a history of fever for 5 days, cough for 5 days, breathlessness and blueness for 2 days prior to admission. The child was well till 5 days before admission, when he started having high fever which subsided after taking medicines from his general practitioner. However, fever recurred again the next day and remained high. He also had a non-productive cough mainly at night for 5 days. Two days prior to admission he developed breathlessness and cyanosis which became progressively worse and was accentuated by lying flat and coughing.

On admission he was found to be febrile (T—102°F), restless, breathless with stridor and intercostal recession. He tended to lie on the right side. There was bilateral ankle edema and the jugular venous pressure was raised. The pulse was regular with a pulse rate of 165/min.; blood pressure was 90/60 mm. Hg. There was a slight bulge on the right side of the chest anteriorly. The lungs were dull to percussion on the right side of the chest anteriorly but resonant posteriorly. Air entry was reduced on the right side especially anteriorly. Crepitations and rhonchi were heard over all lung fields but more on the right side. The liver was palpable 3 fingers breadth below the right costal margin.

Investigations showed that the Hb. was 7·3 G; white cell count = 23,400/c. mm.; P = 83%; L = 14%; M = 2%; E = 1%; platelets = 500,000/c. mm.; erythrocyte sedimentation rate was 72 mm./hr.; blood urea = 24 mg.%. Serum electrolytes showed that the K = 5·9 mEq./L, Na = 131 mEq./L, and Cl = 100 mEq./l. The postero-anterior and lateral chest X-ray showed a huge opaque mass in the right chest situated mainly anteriorly and apposed to the mediastinum with a small rim of lung tissue compressed posteriorly (See Figs. 1 and 2). The appearance was consistent with an extra-pulmonary mass, most probably a dermoid. The right lung showed some infective changes.

A provisional diagnosis of a mediastinal tumour with broncho-pneumonia was made. The patient was sedated, digitalised, given parenteral streptomycin and penicillin, paracetamol and nasal oxygen but did not improve, although the cyanosis disappeared. He was referred to the cardiothoracic surgeon for thoractomy.

A right thoractomy with enucleation of a dermoid was done on 25.9.68. The dermoid was well circumcribed and was in the right mediastinum with surrounding purulent exudate. The dermoid was 5″ × 5″ × 4″ and consisted of foul smelling

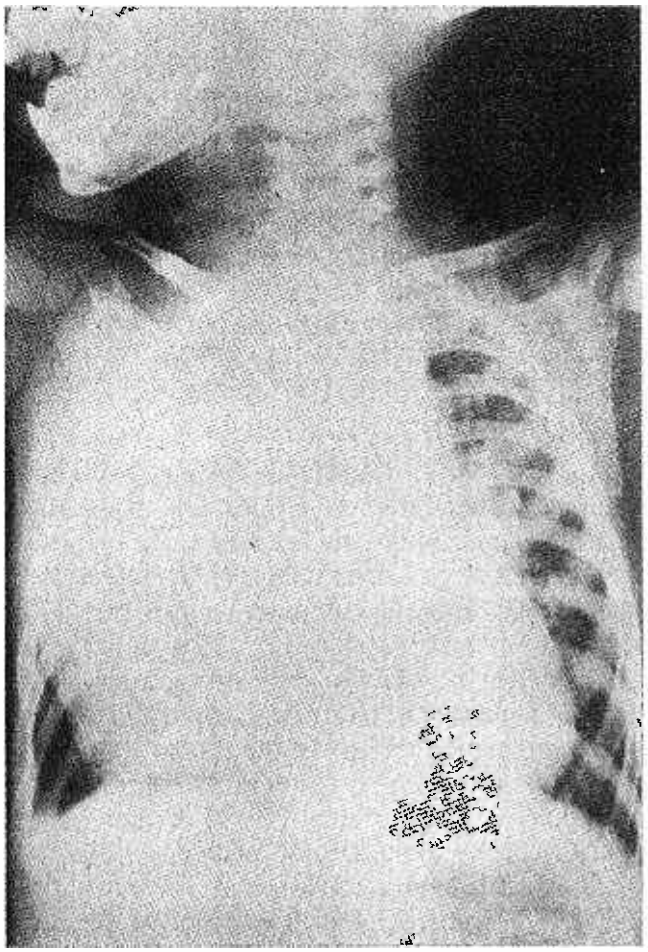

Fig. 1. Chest X-ray showing teratoma of the thymus (A-P view).

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Fig. 2. Chest X-ray showing teratoma of the thymus (lateral view).

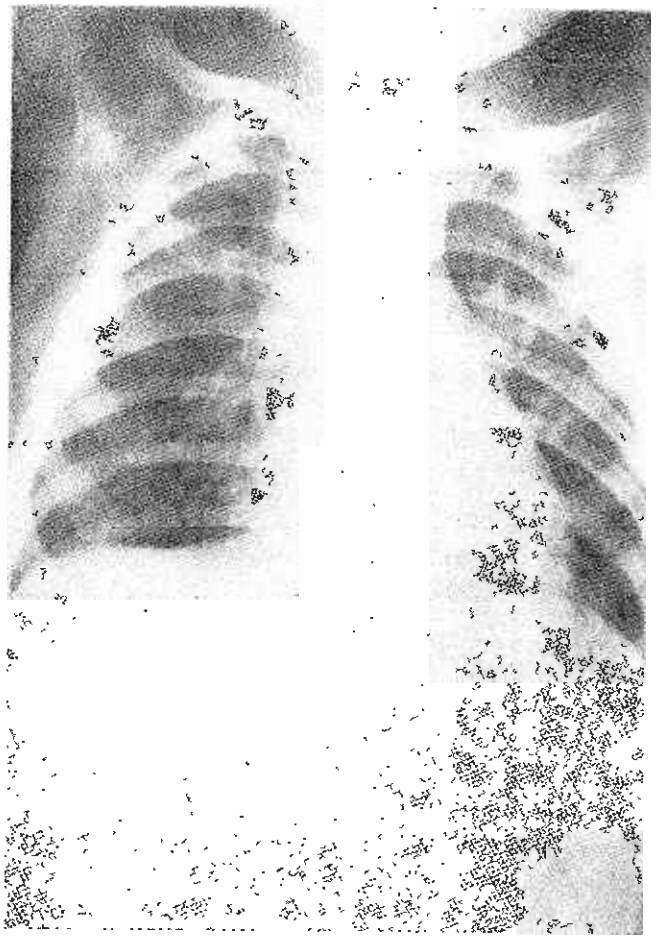

Fig. 3. Chest X-ray 3 weeks after removal of thymic teratoma.

fluid with a central mound of tissue about 2" in diameter. Histology showed it to be a benign teratoma of the thymus. The patient improved substantially and had an uneventful post-operative recovery with full re-expansion of the right lung (Fig. 3).

DISCUSSION

Tumours of the mediastinum occur in both children and adults. One-third of mediastinal tumours occur in children. Reviewing the literature up to 1965, I. L. Heinburger *et al* found that mediastinal teratoid tumours constitute 17% of all mediastinal tumours (I. L. Heinburger *et al*, 1965). After the gonads the mediastinum is the commonest site for teratomas and come second after neurogenic tumours of the thorax. In infants and children teratoma is the commonest tumour in the anterior mediastinum (R. H. Adler *et al*, 1960). However, only 10% of mediastinal tumours are thymic tumours (Ochsner A. *et al*, 1966), and thus become the fourth commonest tumours in the mediastinum (T. W. Shields *et al*, 1966).

Mediastinal teratomas can occur from infancy to adult life. Adler reviewing the world literature on extrapericardial teratomas up to 1960, collected 26 cases, the youngest patient was a 2-day-old premature infant, and 15 out of 26 cases occurred in infants between 3 to 8 months of age. All but 3 cases occurred in infants below 1 year of age (R. H. Adler *et al*, 1960). In Heinburger's series of 4 benign cystic teratomas operated upon, the 2 symptomatic cases occurred in infants below 1 year of age (I. L. Heinburger *et al*, 1965).

There is no single accepted theory or opinion on the genesis of extragonadal teratomas. A teratoma is a "true tumour or neoplasm composed of multiple tissues of kinds foreign to the part in which it arises" (R. A. Willis, 1960). Extragonadal teratomas probably arise from local tissue dislocation during embryogenesis. Schlumberger attributes it to tissue dislocation during the formation of the thymus from the branchial cleft (H. G. Schlumberger, 1946). The thymus is the only branchiogenic structure to descend routinely into the mediastinum and also one that gives rise to all 3 germinal layers. This embryological association with the thymus also explains the predominance of extragonadal teratomas in the anterior mediastinum. This is the most plausible theory to account for the mediastinal teratoma in

our patient and probably represents an earlier stage in the embryogenesis since it is still attached to the thymus by a stalk.

Teratomas may be cystic or solid, the cystic ones outnumber the solid ones. The solid ones are more complex and have a greater risk of malignant transformation. The risk of malignancy for any type of mediastinal teratoma is 10-33% (Adler R. H. *et al*, 1960).

Mediastinal teratomas can present as masses found incidentally in chest X-rays of asymptomatic patients or with respiratory and or cardiovascular symptoms. They may present with cough, dyspnoea, stridor and pneumonia. Other symptoms which are less frequent than respiratory symptoms include fever, lethargy, upper respiratory tract infection, chest pain and dysphagia. It is interesting to note that out of 4 benign cystic mediastinal teratomas, 2 were asymptomatic and in these, the tumour was protruding into the left hemithorax. In the other 2 cases which presented with severe respiratory symptoms the tumour was found protruding to the right side with marked anterior compression of the trachea (I. L. Heinburger *et al*, 1965). This is probably because the trachea is normally slightly more to the right rather than in the midline. In our case the mass was mainly in the right hemithorax and presented with severe respiratory symptoms.

Usually teratomas are not discovered till adult life, probably because symptoms are slow to develop unless the trachea was compressed or the tumour was malignant. In infants an anterior mediastinal mass that produces compression of the trachea has usually been a teratoma and has never been an enlarged thymus (J. W. Hope, 1963).

Complications of thymic tumours are due to pressure on adjacent structures or perforation into them. The common symptoms due to pressure have already been mentioned earlier. Pressure on the vena cava, particularly by malignant teratomas may lead to ascites, hepatomegaly and peripheral edema. Arrythmias are occasionally seen due to pressure on the pulmonary conus. Cardiac murmurs which disappear after operation or becomes softer when the patient leans forwards are due to pressure of the tumour on adjacent structures. The incidence of perforation of mediastinal teratomas into adjacent cardiovascular structures is less than 1%, these include perforation into the aorta resulting in exsanguinating haemoptysis, perforation into the superior vena cava and into the pericardial sac resulting in acute cardiac tamponade (J. L. Marsten *et al*, 1966).

Excision of all lesions, both benign and malignant, is thought to be the treatment of choice (I. L. Heinburger *et al*, 1965). Post-operative radiotherapy is given if the tumour is malignant. None survived if only radiotherapy was given for malignant lesions. Systemic chemotherapy is apparently without benefit. Our case was treated by thoracotomy and excision. The child is doing very well and X-ray of the chest 2 months after treatment showed no pathology.

SUMMARY

A case of teratoma of the thymus in a 17-month-old child is reported. The incidence, embryogenesis, clinical presentation, complications and treatment of mediastinal teratomas are discussed.

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