# Giant thymolipoma in a child: The silent chest mass

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Thymolipoma is a rare benign anterior mediastinal tumour of thymic origin containing both thymic and mature adipose tissues. In most cases it has a silent course and can grow to large sizes before presenting with respiratory symptoms. We report a case of a giant thymolipoma in a 4-year-old girl treated at Chris Hani Baragwanath Academic Hospital, South Africa.

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Thymolipomas are rare benign anterior mediastinal tumours consisting of thymic and fatty tissues, and account for 2 - 9% of all thymic tumours.[1] These tumours are slow growing and are usually diagnosed incidentally in older children and young adults. Surgical excision is the mainstay of treatment.[1] We report the case of a young child with a massive thymolipoma who underwent successful surgical removal.

## Case report

A 4-year-old HIV-uninfected girl was referred to the paediatric pulmonology clinic at Chris Hani Baragwanath Academic Hospital, South Africa (SA), with a 2-year history of chronic cough and poor weight gain. She had been treated with repeated courses of antibiotics for respiratory tract infections, and had also been started on tuberculosis (TB) therapy based on the chronic cough and abnormal findings on chest radiographs.

At presentation, she was stunted, had digital clubbing, and had dullness to percussion on the right side of the chest with reduced breath sounds. Her white cell count was raised (20.7 × $10^9$/L) with predominant lymphocytes (80.9%). The frontal chest radiograph showed a dense homogeneous opacification in the right middle and lower zones, and the left middle zone (Fig. 1). The lateral chest radiograph showed that the opacification was from the anterior mediastinum. Bronchoscopy showed a patent right upper lobe bronchus, but the right bronchus intermedius was completely occluded as a result of external compression. The left upper and lower lobes were normal in structure with patent bronchi. A chest computed tomography (CT) scan (Fig. 2) showed an anterior soft-tissue hypodense mass on the right with herniation across the midline to the left hemithorax that displaced surrounding structures but was not encasing them. Histological examination of a Tru-Cut biopsy specimen showed benign thymic parenchyma with no evidence of neoplastic infiltration.

Sternotomy was performed and the entire mass was resected. The tumour was initially removed as a well-encapsulated bilobar mass, but the mass extended posteriorly into the right thorax and required some piecemeal resection (Fig. 3). Two large specimens were analysed, weighing 610 g and 360 g and measuring 170 × 100 × 30 mm and 120 × 60 × 20 mm, respectively. Microscopy revealed thymic parenchymal tissue mixed with mature adipose tissue, and no features of cytological atypia. Numerous Hassall's corpuscles were also seen. The final histopathology report confirmed that the tumour was a thymolipoma. There were no intra- or postoperative complications, and the patient was discharged.

## Discussion

To our knowledge, our patient is the youngest child to have undergone surgical resection of a large thymolipoma in SA. Thymolipomas are rare, slow-growing benign mediastinal tumours that were first described by Hall in 1949.[2] The global incidence has been reported as 0.12 per 100 000 cases per year.[3] Thymolipoma has been linked to various autoimmune diseases, with myasthenia gravis reported in half of the cases, but the pathogenesis remains unclear.

Other conditions that are associated with thymolipoma include red cell aplasia, Graves' disease, lichen planus and hypogammaglobulinaemia.[3] The differential diagnoses for a large mediastinal mass include teratoma, thymoma, lipoma, lipomatosis, liposarcoma and thymoliposarcoma. Thymolipomas can occur at any age, although they are mainly found in young adults (mean age 33 years).[4] However, to our knowledge only 36 cases have been reported in the current available English literature. The youngest patient ever reported was a 6-month-old infant who presented with respiratory distress due to compression of adjacent structures.[5]

The chest radiograph can mimic abnormalities of adjacent structures, such as pericardial effusion, cardiomegaly, atelectasis or lung sequestration.[6] Our patient was initially started on treatment for TB because of the nonspecific radiographic findings. Computed tomography and magnetic resonance imaging are usually diagnostic. They reveal a fatty mass with fibrous septa, which is highly suggestive of a thymolipoma.[7] However, other differential diagnoses are possible, and they include potentially malignant diseases. Definitive diagnosis is through histopathological examination, which should demonstrate mature large lobules of adipose tissue mixed with normal thymus containing epithelial cells, thymic lymphocytes and Hassall's corpuscles.[1] According to our literature

**Table 1. Summary of a literature review of paediatric thymolipomas (references available as a supplementary file at https://www.samedical.org/file/1873)**

| Author | Age (yrs) | Presentation | Investigation | Biopsy | Treatment | Approach | Invasion | Malignancy | Complications |
|---|---|---|---|---|---|---|---|---|---|
| Maekawa *et al.*[S1] | 16 | Incidental CXR, right bundle-branch block | CT chest + MRI | FNA CT guided | Total thymectomy | Sternotomy | No | No | No |
| Miranda *et al.*[S2] | 4 | Recurrent LRTI, CXR | CT chest + MRI | No | Primary resection | n/d | No | No | No |
| Sundstrom[S3] | 8 | Incidental CXR | No others | No | Primary resection, partial thymectomy | Thoracotomy | No | No | No |
| Damadoglu *et al.*[S4] | 16 | Fatigue + myasthenia gravis | CT scan | No | Thymectomy | Sternotomy | No | No | No |
| Daneshbod[S5] | 17 | Dyspnoea on exertion | CXR + CT | No | Thymectomy | Thoracotomy | No | No | n/d |
| Faerber *et al.*[S6] | 5 | Cough, tachypnoea and wheezing for 2 years | CXR, chest US + CT | No | Tumour resection | n/d | No | No | n/d |
| Furukawa *et al.*[S7] | 3 | LRTI, CXR | CT chest + MRI | No | Tumour resection | Thoracoscopy | No | No | No |
| Gregory *et al.*[S8] | 9 | Incidental on CXR for asthma | CT chest + MRI | No | Thymectomy | Sternotomy | No | No | No |
| Gunnels *et al.*[S9] | 4 | Incidental CXR | Cardiac catheterisation | No | n/d | Sternotomy | No | No | No |
| Gupta *et al.*[S10] | 11 | Chest pain | CXR + CT | EUS-FNA | Tumour resection | Thoracotomy | No | No | No |
| Herrera *et al.*[S11] | 8 | Incidental CXR | Bronchogram, aortogram, CT scan | No | Tumour resection | Thoracotomy | No | No | n/d |
| Kitano *et al.*[S12] | 6 | Bulging thorax | CXR + CT + MRI + angiography | No | Tumour resection | Sternotomy | No | No | n/d |
| Alizadeh *et al.*[S13] | 6 | Persistent cough | CXR + CT | EUS FNA + open | Tumour resection | Sternotomy + thoracotomy | No | No | No |
| Nishimura *et al.*[S14] | 6 | Incidental CXR | CT chest + MRI | FNA | Tumour resection | n/d | No | No | No |
| Onoda *et al.*[S15] | 2 | Stridor | CXR + CT + MRI | No | Tumour resection | n/d | No | No | No |
| Otto *et al.*[S16] | 5 | Anaemia + recurrent infections (erythrocyte hypoplasia and hypogammaglobulinaemia) | CXR | n/d | n/d | n/d | n/d | No | No |
| Park *et al.*[S17] | 16 | n/d | CT scan | n/d | Tumour resection | Robotic subxiphoid | n/d | No | No |
| Parakh *et al.*[5] | 6 mo | Tachypnoea | CXR + CT scan | US-guided TruCut | Tumour resection | Thoracotomy | No | No | n/d |
| Patel *et al.*[S18] | 11 | Right cervical mass | CXR + CT scan | Open | Tumour resection | Sternotomy | No | No | No |
| Ringe *et al.*[S19] | 17 | Incidental CXR | CXR | No | Tumour resection | Sternotomy | No | No | No |

**(continued)**

**Table 1. (continued) Summary of a literature review of paediatric thymolipomas (references available as a supplementary file at https://www.samedical.org/file/1873)**

| Author | Age (yrs) | Presentation | Investigation | Biopsy | Treatment | Approach | Invasion | Malignancy | Complications |
|---|---|---|---|---|---|---|---|---|---|
| Rosado-de-Christenson *et al.*[S20] | 0 - 19 | n/d | n/d | n/d | n/d | n/d | n/d | n/d | n/d |
| Shillitoe and Goodyear[S21] | 7 | LRTI, CXR | CXR | No | Thymectomy | n/d | No | No | No |
| Andrus and Foot[S22] | 13 | Dyspnoea | n/d | n/d | n/d | n/d | n/d | n/d | n/d |
| Bigelow and Ehler[S23] | 10 | Cough | n/d | n/d | n/d | n/d | n/d | n/d | n/d |
| Tan *et al.*[S24] | 4 | Asthma, CXR | CT scan | No | Tumour resection | Thoracoscopy | No | No | No |

CXR = chest radiograph; CT = computed tomography; FNA = fine-needle aspiration; MRI = magnetic resonance imaging; LRTI = lower respiratory tract infection; n/d = not documented in the case report; US = ultrasound; EUS = endoscopic ultrasound.

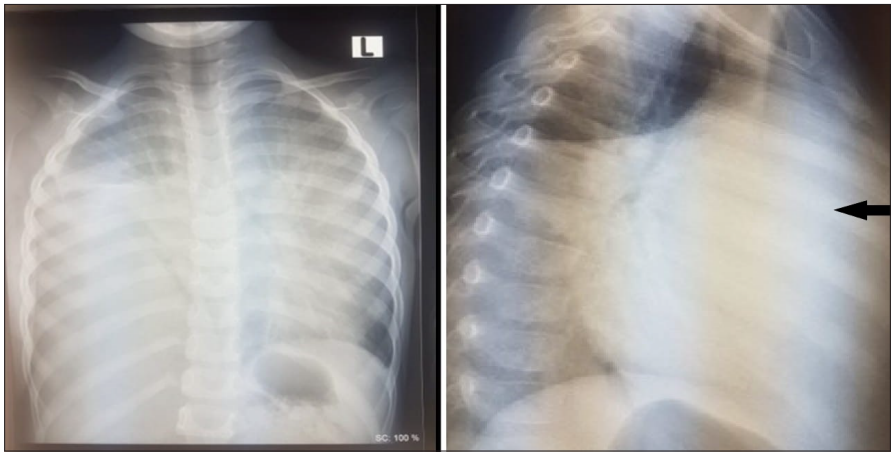


*Fig. 1. (A) Frontal chest radiograph showing right homogeneous opacification in the middle and lower zones including the left middle zone. (B) Lateral view indicating anterior mediastinal mass (arrow).*

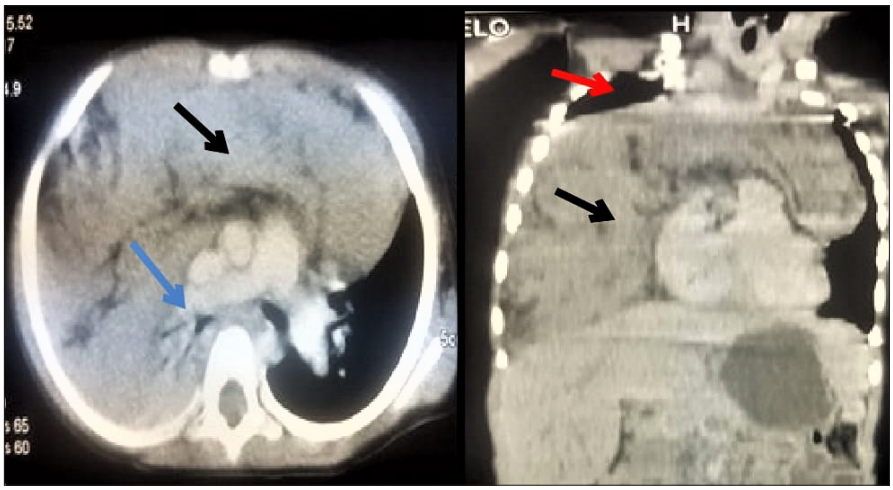

*Fig. 2. (A) Axial cut mediastinal window computed tomography scan of the chest showing the soft-tissue dense mass on the right, herniating to the left hemithorax (black arrow). The blue arrow shows the compressed right bronchus. (B) Coronal view showing the compressed right lung (red arrow).*

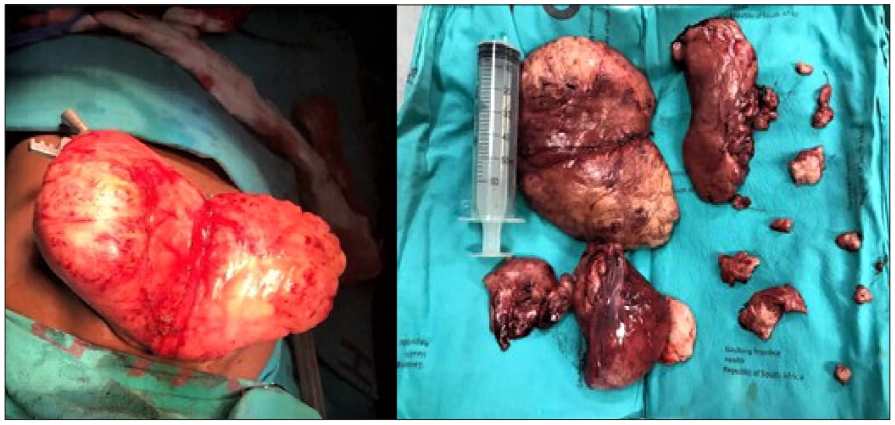

*Fig. 3. Anterior sternotomy revealed the well-capsulated mass, which was resected in totality.*

review, a preoperative biopsy specimen was obtained in only 6/36 patients (16.2%), 4 via fine-needle aspiration, 1 open and 1 Tru-Cut. In our case, a Tru-Cut biopsy revealed that the tissue was fatty in nature and ruled out malignant disease. We believe that obtaining a preoperative diagnosis is important in planning surgical intervention. Ruling out

malignancy allows the surgeon to avoid pursuing an aggressive, radical procedure, and even to consider minimally invasive approaches. The fact that no recurrence or malignant transformation has been reported supports limited tumour excision through a minimally invasive approach.[6]

The definitive treatment for thymolipomas is surgical.[1] Several surgical approaches have been used, including thoracotomy, video-assisted thoracoscopy and sternotomy, and the decision depends on the size and location of the tumour.[1] In our review, the approach was reported in only 16 cases, with sternotomy being the most commonly used, followed by thoracotomy. The approach in our case was dictated by the size of the tumour, as a sternotomy allows good access to the mediastinum and both hemithoraces, and is usually well tolerated in children. Published data on the paediatric population reveal no malignant or surgical complications after intervention.

## Conclusion

Thymolipomas are rare, slow-growing benign neoplasms, mostly diagnosed incidentally, and should be considered as a differential diagnosis when a child presents with an anterior mediastinal mass. Compression symptoms indicate a tumour of large size. Plain radiographs can be misleading in some cases, or delay definitive diagnosis and management. Surgical intervention remains the only curative measure, and is tolerated well in the paediatric population.

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