

# Case Report of a 17 Year Young Adult with Dermoid Cyst in Thymus

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## Abstract:

*Teratoma of thymus gland is a rare variety of anterior mediastinal tumour. It may cause compression over airway resulting respiratory depression. This is a case of a 17 year young adult, farmer, presented with swelling over front of root of neck for 1 month with history of surgery over the same region 4 months back. Clinically two oval, pedunculated masses were found. CT scan of chest revealed enlargement of thymus. FNAC of the mass could not exclude possibility of mesenchymal or thymic neoplasm. Peroperatively thymus was found enlarged and was variegated in appearance (dermoid and gelatinous material was found). Thymus was resected in toto. Excision of sinus tract was also done. His operation was uneventful, postoperative recovery was excellent. He was discharged to home on 14<sup>th</sup> postoperative day with good physical condition. Although rare, mediastinal teratoma should be considered as a differential diagnosis of anterior mediastinal tumours. Early diagnosis and complete excision is necessary. Possibility of malignant change should also be considered.*

**Key Words:** Thymus, Mediastinal teratoma, Dermoid cyst.

## Introduction:

Tumours of the thymus are clinically called mediastinal tumours. Mediastinal teratomas are the most common extra-gonadal germ cell tumours. They account for approximately 15% of anterior mediastinal masses in adults and approximately 25% of anterior mediastinal masses in children.<sup>1</sup>The mediastinum is the most common extragonadal location in which germ cell tumors are found. About 5-10% of all germ cell tumors are found in the mediastinum. All these tumours become dangerous from pressure and invasion of other surroundings. Mature teratomas and most immature teratomas are benign tumours, but still carry a risk of malignancy and require close clinical, serological, and radiological follow-up, or surgical excision.<sup>2</sup>Usually it occurs within or near the thymus gland. Complete surgical resection and/or chemotherapy is indicated depending on nature of teratomas.

## Case Report:

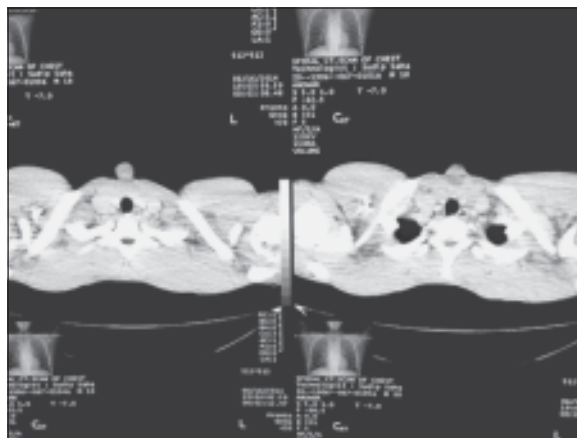
A 17 year young adult, normotensive, nondiabetic, nonsmoker farmer, presented with swelling over the front of the root of neck for 1 month and history of surgery over the same region 4 months back. At first it was evident as a rapidly growing painful mass which was diagnosed as an abscess. Incision & drainage was done 4 months back which was followed by regular dressing, healing of the wound

was completed by 1 month. Again after 1 month a small swelling appeared over the same region which was painless, gradually increasing in size. He did not complain of difficulty in deglutition, fever or sudden change in weight. Later, the swelling became larger and pedunculated, and a second swelling appeared from the root of previous one.

On examination, his pulse was 90 beats/min, regular with normal volume, blood pressure was 100/70 mm of Hg. On examination of his swelling over front of root of neck, two oval, pedunculated swellings were found over the suprasternal notch, measuring about 3.5X2.5cm and 2.5X2.0cm, non-pulsatile, freely mobile and connected to the skin with a stalk, firm in consistency, non-tender, did not bleed on touch, overlying skin of both the swellings were smooth, reddish to blackish (Figure-1). Local temperature was not raised. The base was surrounded by a rim of thick crust. Surrounding lymph nodes were not palpable. There was no wasting of the muscles of neck and was no restriction of neck movement. Systemic examination revealed normal. His hemoglobin was 14.1 gm/dl, ESR was 20 mm in 1<sup>st</sup> hour. Total count was 16.0X10<sup>9</sup>/L with neutrophils 85%. X-Ray Chest P/A view reported a dense lobulated shadow in right paratracheal region and another dense oval shadow over the lower part of trachea. CT Scan of the Chest revealed normal findings of the chest with enlarged thymus (Figure-2). Culture of pus from base



**Fig.- 1:** Mass in the front of root of neck.

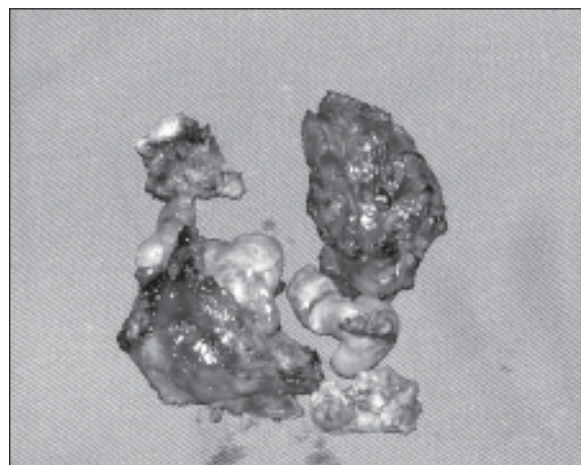


**Fig.- 2:** CT Scan of the Chest showing normal findings of the chest with enlarged thymus.

of the mass revealed no growth. FNAC of the mass could not exclude possibility of mesenchymal or thymic neoplasm. His serum Free T4 level was 2.80ng/dl. Ultrasonogram of the Thyroid gland revealed no abnormality. Since admission patient received medical management. As there was diagnostic dilemma and the swelling was gradually increasing in size and number, overlying skin becoming blackened, surgery was planned to explore the cause and for complete excision of the mass. On the day before surgery both the pedunculated masses spontaneously fell off from the stalk leaving a discharging sinus tract.

The patient was in supine position. After he was under general anaesthesia, a sand bag was placed under his neck to expose the operation field properly. Standard median sternotomy was done. Thymus was found enlarged

in size. It was variegated in appearance (dermoid and gelatinous material was found). It was firmly adherent with pericardium and pleura, and also encircled brachiocephalic vein. Thymus was dissected from the bed and surrounding structures. It was resected in whole (Figure-3). Excision of sinus tract was also done. Sternotomy was closed with sternal wire and skin was closed in layers keeping the area of sinus tract open. The resected tissue was sent for histopathology. Patient was transferred to ICU with good hemodynamic condition. Regular dressing of the wound done in ward. On 14<sup>th</sup> post-operative day secondary closure of the wound done. Histopathology report of resected tissue revealed mature teratoma, no malignancy found. Patient was discharged from hospital with medical management and advice for follow up after 2 months.



**Fig.-3:** Resected thymus.

#### **Discussion:**

Tumours of the thymus are clinically called mediastinal tumours, which may include tumours of the bronchial and mediastinal lymph nodes. All these tumours become dangerous from pressure and invasion of other surroundings. True tumours of the thymus gland are very rare. Malignant tumours are quite rare, though neoplasms of the thymus have been repeatedly observed in myasthenia gravis.<sup>2</sup> Congenital cysts may arise in the anterior mediastinum from tracheal diverticula or congenital displacement of the bronchial tree, or the endodermal epithelium in the thymus may also be a point of origin. This probably is the etiology of some dermoid cysts, usually lobulated multilocular tumours with yellow-white fatty contents, or they may arise from inclusion of epidermis during the closing of the thorax. Cystic teratomas appear similarly but contain cartilage, bone, mucosa or tissue from all three germinal layers.

Mediastinal teratomas are the most common extra-gonadal germ cell tumours. They account for approximately 15% of anterior mediastinal masses in adults and approximately 25% of anterior mediastinal masses in children. They are by far the most common mediastinal germ cell tumour, accounting for 50-70% of such tumours.<sup>3</sup> The age of presentation is wide, but typical presentation in adults is in the third or fourth decade (20s and 30s). In children below 1 year of age, immature teratomas are common (40%) and may be detected antenatal.<sup>3</sup> No definite gender predilection for mature teratomas has been identified (at most there is a slight female predilection). Immature teratomas however, occur almost exclusively in males.<sup>3</sup> Mediastinal teratomas are germ cell tumours arising from ectopic pluripotent stem cells that failed to migrate from yolk endoderm to the gonad. By definition they should contain elements from all three embryological layers: endoderm, mesoderm and ectoderm. Frequently however elements from only two layers are evident. A mediastinal dermoid cyst can be considered a variant of a mature teratoma, predominantly formed by squamous epithelium and skin appendages (ectoderm and mesoderm respectively).<sup>3</sup> Mature teratomas and most immature teratomas are benign tumours, but still carry a risk of malignancy despite being indolent initially and require close clinical, serological, and radiological follow-up, or surgical excision.<sup>3,5-6</sup> There is also a low incidence of malignant transformation of somatic cells (i.e. non germ cell components) within these tumours e.g. carcinoma, sarcoma, leukaemia.<sup>7</sup> Usually it occurs within or near the thymus gland.

Treatment depends on whether the teratoma is mature or immature. In the former, surgical resection is curative. In the later management depends on alpha-FP levels. If these are elevated then postoperative chemotherapy is usually employed.<sup>8</sup> A few surgeons in the late 1800s and early 1900s attempted and described surgical approaches to the mediastinum. In 1893, Bastinelli described the removal of an anterior mediastinal dermoid cyst. The procedure required resection of the manubrium, but the patient recovered. In 1897, Milton wrote extensively on mediastinal surgery using the median sternotomy approach.<sup>10</sup> In 1940, Heuer published a monograph on mediastinal tumors.<sup>10</sup> Heuer noted that at that time, dermoid cysts and teratomas were the most commonly found tumors of the mediastinum. He also described successful removal of neurogenic tumors from the posterior mediastinum and described several types of thymic tumors.<sup>10</sup>

Complete surgical resection is indicated for even in benign teratomas. A median sternotomy, mini-sternotomy,

posterolateral thoracotomy, hemiclamsell thoracotomy with or without neck extension, clamshell, and video-assisted thoracic surgery (VATS) are all described as methods for resection.<sup>11</sup> Additional resection is needed when teratomas are adherent to adjacent structures. Surgical resection is not the primary treatment for malignant nonseminomatous germ cell tumors. Surgical resection is indicated after completion of chemotherapy for a residual mediastinal mass in patients who have negative levels of serum tumor markers. This is performed both for diagnosis of the remaining mass and for prevention of possible future malignant degeneration of any residual abnormal tissue. Some consider resection even if tumor markers remain elevated.<sup>12</sup>

Prognosis of mature teratomas is excellent as they are benign tumours. Pure immature teratomas also usually have excellent prognosis especially in childhood. In up to 30% of cases however, immature teratomas have a malignant germ cell tumour component (most frequently yolk sac tumour), which result in frequent (25%) recurrence. Nonetheless with adjuvant chemotherapy a greater than 80% 3 year survival can be achieved in children. Prognosis in adults is less favourable.<sup>3</sup> Our patient was 17 years old male. We performed complete resection of the mass.

Potential complications include respiratory distress/failure (more common in infants than adults), haemorrhage, pneumothorax, fistula formation (aorta, SVC, oesophagus, bronchus), rupture of bronchus, pericardium and pleural cavity. In our described case there was no respiratory distress, but there was sinus formation.

### Conclusion:

Any patient presenting with a mass in anterior mediastinum, one must not forget about thymic mass. Though rare, teratoma should be considered as a differential diagnosis. Prognosis of benign teratoma is excellent, but if it is malignant, adjuvant chemotherapy followed by excision is preferred. As there is chance of recurrence, early diagnosis and complete excision is essential.

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