

## Case Report

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# Mediastinal mature teratoma in an adolescent: a rare case presentation

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## ABSTRACT

Teratomas are the most common germ cell tumours composed of two or more germ layers. Mediastinum is the most common site of extragonadal germ cell tumour. Teratomas are relatively rare of all tumours in mediastinum. Here, we report a rare case of an adolescent who presented with chest pain and breathlessness. CT scan showed a large, well-defined lesion with internal fat density, calcifications, cystic and solid components arising from anterior mediastinum. He was successfully operated and treated at New Civil Hospital Surat attached to Government Medical College Surat. The purpose of this case report is to bring in light to the mediastinal mature teratomas in adolescents as they have very low incidence rate.

**Keywords:** Mediastinum, Teratoma, Thoracotomy

## INTRODUCTION

The medical term “teratoma” derives its origin from the words “terato” and “oncoma” which mean “monster” and “swelling,” respectively. They are dubious in origin, have bizarre and vague microscopic appearance, and unpredictable behaviour.<sup>1</sup> This makes them mysterious but fascinating.

Of all the germ cell neoplasms, mediastinal germ cell tumours contribute to only about 1-3% of all cases. Mediastinal tumour in the paediatric age group and adolescent age group is still infrequent.<sup>1</sup>

Teratoma is derived from pluripotent embryonic cells which undergo differentiation into tissues with two or more germ cell layers.<sup>2</sup> They can be classified into mature solid or cystic teratoma, immature teratoma and teratoma with malignant transformation. They are more commonly associated with compression of adjacent structures, predominantly those of the respiratory system.

Herein, we report a case of a successful surgical management of a large mediastinal mature teratoma in an adolescent.

## CASE REPORT

A 13-year-old male presented at New Civil Hospital Surat (attached to Government Medical College Surat) with right sided chest pain and breathlessness for 3 months. The condition of the patient worsened 15 days back when he developed fever with exaggeration of chest pain over right side due to which his school life was getting affected. No history of cough was present. He denied any weight loss. The patient did not have any significant past history nor the significant family history.

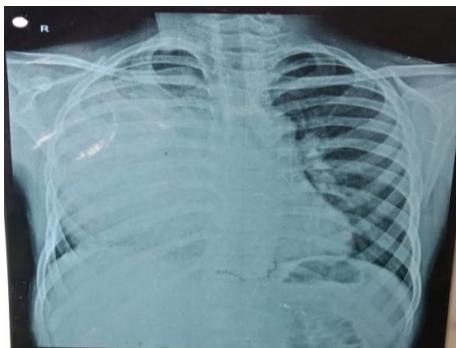
Physical examination of this patient revealed asymmetrical chest with fullness over his right anterior chest wall. Breath sounds were diminished over the right hemithorax (Figure 1).

The patient was having normal vitals with normal saturation of oxygen on pulse oximetry. Chest X-ray of

the patient revealed large opacity over the right side obliterating the right heart border and trachea was deviated to the left side (Figure 2).



**Figure 1: Physical appearance of patient's chest depicting asymmetry and fullness over right side.**



**Figure 2: Preoperative X-ray chest showing opacity over right side of thorax.**

Computed tomographic scan of the thorax showed a large heterogenous, well defined lesion sized  $14 \times 11 \times 15 \text{ cm}^3$  with internal fat density, calcifications, cystic and solid components arising from anterior mediastinum. Compressive luminal narrowing of right bronchus was also evident on computed tomography (CT) chest. Lesion was tethered to pericardium. The mediastinal structures did not show any abnormal lymph nodes. No evidence of lung metastasis was present (Figure 3).



**Figure 3: CT Chest showing heterogenous mass over right side with various components.**

Two-dimensional echocardiography was performed and it revealed a normal-sized heart with normal function and blood flow velocities. Serum beta human chorionic gonadotropin, alpha fetoprotein and lactate dehydrogenase were found to be normal.



**Figure 4: Appearance of mass on right postero-lateral thoracotomy.**



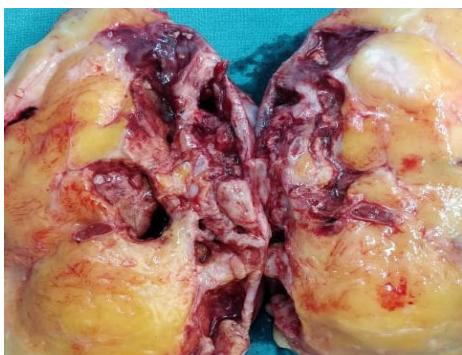
**Figure 5: Separation of capsule from lateral wall using electrocautery.**

Subsequently, he underwent right posterolateral thoracotomy through the right 4<sup>th</sup> intercostal space (Figure 4). Intraoperatively, capsule encasing the large tumour was separated from the posterolateral chest wall using harmonic scalpel. It was adhered to pericardium on antero-medial side which was separated very carefully. Therefore, avoiding any injury to the pericardium. Debulking of the cystic components was done. About 200cc of cheesy material was drained out. Adhesions with upper lobe of right lung removed. Tumour was completely mobilized and then delivered out. Double lumen ventilation with right sided endotracheal tube was very helpful. Intercostal chest tube number 28 was inserted in right 6<sup>th</sup> intercostal space. Ribs were approximated and tied. The surgical approach was quite successful and satisfactory (Figure 5).

The tumour was lobulated, well encapsulated, measured  $16 \times 12 \times 8 \text{ cm}^3$  and weighed 430 gm (Figure 6). Cut surface of the tumour showed variegated appearance with abundant fatty tissue with both solid and cystic areas. Haemorrhagic areas present in between (Figure 7).

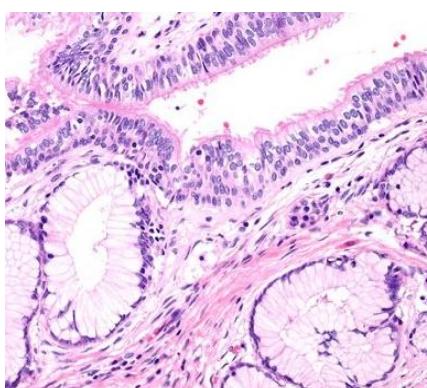


**Figure 6: Gross appearance of the mass excised.**



**Figure 7: Cut section of excised showing fatty tissue with cystic spaces.**

On histopathological examination, mature adipose tissue was present predominantly with intestinal epithelium, ciliated pseudostratified columnar epithelium, seromucinous glands and muscle tissue. Areas of calcification, cartilage, bony tissue, fibrovascular proliferations and mature glial tissue were also seen (Figure 8).



**Figure 8: Microscopic appearance showing adipose tissue with various types of epithelium.**

Post-operatively, patient was given nebulisation and chest physiotherapy actively. He performed spirometric exercises at regular intervals. Improvement was seen from 2<sup>nd</sup> postoperative day. Epidural catheter was removed. On 9<sup>th</sup> postoperative day, chest tube was

blocked. On 12<sup>th</sup> postoperative day, chest tube was removed. On 15<sup>th</sup> postoperative day, patient was discharged well without any complication (Figure 9).



**Figure 9: Scar mark of surgery seen over chest on discharge of patient.**

Chest X-ray of the patient on discharge showed much improvement in comparison to the pre-operative X-ray (Figure 10).



**Figure 10: Chest X-ray of patient on discharge showing expanded lung on right side and hence improvement in comparison to preoperative state.**

## DISCUSSION

Mediastinal teratoma occurs in adolescents and children typically as an anterior mediastinal mass. There can be various differential diagnosis for an anterior mediastinal mass in children which can be lymphoma, thymoma, thymic cyst, neurogenic tumours, germ cell tumours, mesenchymal tumours etc.<sup>3</sup>

Most of the patients with mediastinal teratomas are asymptomatic and diagnosed incidentally during routine chest X-ray. Compression symptoms are a common presentation, attributed to its mass effect to the mediastinal structures. Our patient in this case report presented mainly with respiratory symptoms as a result of the compression effect by the anterior mediastinal teratoma. A rare finding associated with rupture is hair or sebaceous material expectoration.<sup>4</sup> There have been rare

reports of tumour getting ruptured into the pleural cavity, pericardium, lung parenchyma, tracheobronchial tree and great vessels, leading to life threatening complications. So, this may require surgery in emergency.

Most mediastinal teratomas are benign mature teratomas which have well differentiated germinal derivatives. To make the diagnosis of teratoma, it is mandatory to find at least two of three germ layers. The ectoderm tissue generally is predominant and is composed of neural tissues, skin, hair, and teeth. Immature teratoma is characterized when immature germinal derivatives are seen. Teratoma with malignant transformation is rarely encountered and presence of sarcoma, squamous cell carcinoma, adenocarcinoma or carcinoid have also been reported.<sup>5</sup>

CT is the radiological modality of choice and to study the extent of mediastinal tumour. Mediastinal benign teratomas are typically well circumscribed, heterogeneous masses with radiographic features of multilocular cystic, solid and fatty components with calcifications. These radiographic features may not be present in all cases. Elevation of tumour markers like alpha fetoprotein and human chorionic gonadotropin may indicate malignancy.

The treatment of choice for mediastinal mature teratoma is complete surgical excision.<sup>1</sup> Additional procedures like lung wedge resection, lobectomy or prosthetic vascular reconstruction may be required. Adjuvant therapy has no role in treatment of mediastinal mature teratoma.

For management of immature teratoma, platinum-based neoadjuvant chemotherapy followed by surgical resection or adjuvant chemotherapy is considered. Radical resection in case of immature teratoma determines the long-term survival and low recurrence rate. Teratoma with malignant transformation has an aggressive behaviour with rapid progression or metastasis. It has got

poor prognosis despite combination of surgery and adjuvant chemo-radiotherapy.

## CONCLUSION

Complete surgical excision is the treatment of choice for mediastinal mature teratoma but complete removal of mature teratoma may pose a serious challenge when it is strongly adhered to vital mediastinal structures. So, careful surgical planning and approach is mandatory so as to provide adequate exposure, meticulous dissection and removal of mediastinal tumour.

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