

The Retroconversion of Immature Mediastinal Teratoma with Chemotherapy: A Case Report

Mohammad Serajus Salekin
and Mohammad Tajul Islam

Department of Cardiovascular and Thoracic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh

Abstract

Mediastinum is a common localization of extra gonadal teratoma. Mediastinal teratoma, which is comprising of 1-5% of all mediastinal tumors is an infrequent germ cell tumor. Immature mediastinal teratoma is a rare malignant neoplasm, which has an ability to metastasize and recur and histologically resemble embryonal structures. There are few reports in literature, which show post chemotherapeutic retroconversion of immature teratoma; however, retroconversion of mediastinal teratoma into mature teratoma is not common. A 19-year-old boy was diagnosed a case of immature mediastinal teratoma by Computed tomography-guided FNA (Fine Needle Aspiration) and received 6 cycles chemotherapy by bleomycin, etoposide, and cisplatin regimen. After that, surgically total excision of tumor was done and histopathological report reveals mature teratoma, which is presented in this paper.

Keywords: Mediastinum teratoma; Germ cell tumor; Histopathology; Intralesional calcification; Malignant neoplasm; Alpha-fetoprotein; Immature mediastinal teratoma

Corresponding author:

Mohammad Serajus Salekin

✉ drsalekin@gmail.com

Department of Cardiovascular and Thoracic Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh.

Tel: +8801973426804

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Introduction

Mediastinal germ cell tumor are rare and represent approximately 1-3% of all germ cell neoplasm [1]. Mediastinal teratoma originates from pluripotent embryonic cells and it differentiates into tissues with all germ cell layers [2]. Mediastinal teratoma is classified into mature, immature, and teratoma with malignant transformation [3]. Most common mediastinal teratoma is benign mature teratoma, which have well differentiated germinal tissues, mainly comprising of ectodermal tissues. Immature teratoma has immature germinal derivatives. Immature mediastinal teratoma are rare, found in only 1% of all mediastinal teratoma [4]. About 36% of patients with mediastinal tumor are asymptomatic at the moment of diagnosis [5]. When symptoms are present, they may be due to compression, invasion of intrathoracic structures or diagnosed by chance during chest imaging. Computed Tomography (CT) of chest is the first investigation of choice to confirm the diagnosis and to identify the extent of mediastinal tumor. Mediastinal benign teratoma is usually well circumscribed and it gives radiographic features of multilocular cystic, solid, and fatty components with calcification. However, these radiographic features is not present in all cases and only 20-40% of cases give features of calcifications [2,6]. On the other hand, on CT mediastinal immature teratoma manifests as a heterogeneous

mediastinal mass containing soft tissue fluid, fat, calcification, or any combination of four [7]. Increasing value of tumor markers like alpha-fetoprotein and human chorionic gonadotropin hormone may suggest malignancy. Treatment of immature teratoma in surgery and chemotherapy [8]. Retroconversion of immature malignant tumor by chemotherapy where chemotherapeutic eliminates malignant component of tumor or altered tumor cell structure, which transforming totipotent malignant germ cell into mature benign teratoma. A case in which the patient was received chemotherapy due to immature mediastinal mass diagnosed by CT guided FNA and mature mediastinal teratoma is detected through the biopsy is conducted after the total surgical excision of tumor, subsequently is presented in this paper.

Case Report

A 19-year-old boy presented with occasional fever, productive cough, chest pain, and weight loss for last six months, which is for 1-1½ months interval present 3-4 days is resolved by antibiotics and analgesics. On x-ray chest Posterior Anterior view, a large well marginated mass on anterior mediastinum extending to the right hemithorax with obliteration of both cardiophrenic and costophrenic angles. On CT chest, one large irregular slightly enhancing soft tissue density mass lesion having intralesional calcification is noted in the right anterior mediastinum,

measuring about 13 × 10 cm in size and mediastinum shifted to the left and encysted pleural effusion in the right pleural cavity. Tube thoracostomy was done for severe respiratory distress about 1200 ml haemorrhagic fluid came out and subsequent days chest drain tube collection gradually decreased, chest drain tube is removed on 7th postoperative day. Tumor markers Alpha-Fetoprotein (AFP) 30954 ng/ml, Human Chorionic Gonadotropin (hCG) 0.25 mIU/ml, Lactatedehydrogenase (LDH) 358 U/L. Fine-needle aspiration (FNA) from mediastinal mass positive for malignant teratoma. He has received 6 cycles chemotherapy bleomycin, etoposide, cisplatin regimen, where first four cycles by Inj. Bleomycin 30 mg (Day 1,8,15), Inj. etoposide 150 mg (Day 1-5), Inj. cisplatin 30 mg (Day 1-5), fifth cycle by Inj. etoposide 150 mg (Day 1-5), Inj. cisplatin 30 mg (Day 1-5) and sixth cycle by tab. etoposide 50 mg twice daily for 5 days. After receiving 1st cycle chemotherapy, his tumor markers are reduced alphafeto-protein 54.16 ng/ml, hCG <1.2 mIU/ml and reduce size of mediastinal mass. After completion of 6 cycles chemotherapy, he was evaluated by clinically, measuring tumor markers and radiologically by Chest x-ray and CT scan of chest with contrast. Tumor markers AFP 3.57 ng/ml, LDH 214 U/L, hCG <1.20 IU/L. Chest x-ray shows dense homogenous opacity in mid and lower zones of right lung field, which was not separated from the mediastinum, scattered calcification in lower zone of lesion (Figure 1).

CT chest finding is well defined capsulated mixed density large mass measuring about 8 × 7.5 cm having areas of fat density, scattered calcifications and dental element is noted in anterior

and middle mediastinum on right side. Superior venacava is compressed by mass but fat plane is maintained. Per operative findings is huge mass about 7 × 7 cm in size adhere with lung, pericardium present in middle mediastinum in between heart and lung and cut section shows areas of fatty tissue, cartilage, hair follicles, bone tissues. After total excision of mediastinal mass histopathology report reveals mature teratoma and post operatively tumor markers alpha feto protein 2.74 ng/ml and HCG 1.13 mIU/ml (Figure 2).

Discussion and Conclusion

In contrast to ovarian and sacrococcygeal region, the mediastinum is a rare location for a teratoma, Schneider et al. describes two German studies where 1193 patients were diagnosed with testicular and nontesticular germ cell tumor and only 4.3% of these patients had a mediastinal teratoma [9]. The most common location of extra gonadal germ cell tumor is anterior mediastinum [10,11]. Mediastinal germ cell tumor represent approximately 15% of anterior mediastinal tumor in adult and 24% in children. Benign germ cell tumors occur in male and female patients with equal frequency. However, male patients suffer from germ cell tumor most commonly. Mature teratoma followed by Seminoma is the most common histologic type of mediastinal germ cell tumor [1]. Germ cell tumor commonly affect patients below age of 30 years and in childhood. Only 3% and 20% of all teratoma is immature teratoma and malignant teratoma respectively. Immature teratoma differs from benign teratomas in terms of

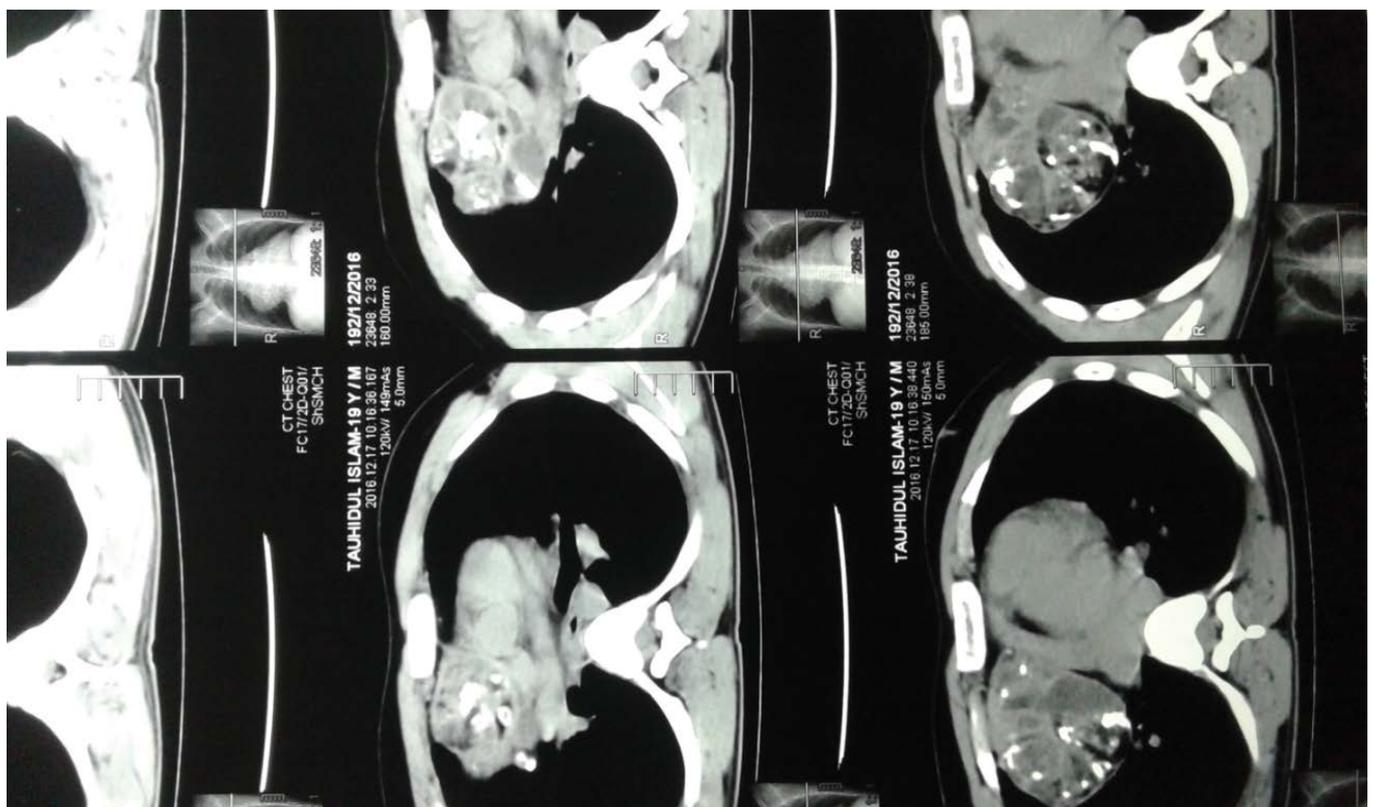


Figure 1 Post chemotherapeutic CT of chest.



Figure 2 Cut section of mediastinal teratoma.

tissue component that observed in fetus or embryo. Any type of tissue may be found in immature teratoma, most common is neurogenic. Immature teratoma grow rapidly and metastasized by penetrating the capsule. The most distinctive feature distinguishing malignant teratoma from mature teratoma is the neuroectodermal components that involves. The pathogenesis of extragonadal immature teratoma is not understood completely yet. However clinically, it is impossible to differentiate mature teratoma from immature teratoma. It can be differentiated only by careful histological examination. Determination of serum tumor markers Alpha Fetoprotein (AFP) and HCG is important in the diagnosis and follow up of mediastinal germ cell tumors. Differently from immature teratomas, patient with benign teratomas have normal tumor markers [12-15]. CT of chest is the first choice for the diagnostic evaluation of immature and mature mediastinal teratoma. It shows tumor location and extension as well as intrinsic elements including soft tissue, fat, fluid and calcification [16]. The mediastinal immature teratoma manifests as a heterogeneous mediastinal mass containing soft tissue fluid, fat or calcification or any combination of four. Mediastinal mature teratomas typically manifest on CT chest as a heterogeneous sharply marginated spherical or lobulated mediastinal masses containing soft tissue, fat, fluid and calcium attenuation or any combination of the four. Fat fluid levels, considers highly specific for the diagnosis of the mediastinal mature teratoma, which are uncommon [7]. The mediastinal masses can give differential diagnosis like mediastinal fat pad, mediastinal lipomatosis, lipoma, omental herniation, thymolipoma and liposarcoma. However, immature teratoma due to their cystic appearance with predominance of fluid elements and high frequency of calcification, findings readily seen on CT scans which can be easily differed from these lesions.

In our case, after chemotherapy CT Chest shows a heterogeneous

smooth-lobulated edged mass which arises from the right anterior mediastinum comprising of soft tissue, fluid, fat and calcification.

In 15 years aged patients with immature mediastinal teratoma, complete surgical resection is absolutely necessary. Long survival can be expected after complete resection combined with chemotherapy [4]. Mature tissues might co-exist with immature tissues in many germ cell tumors. Theoretically it is expected that chemotherapy will eliminate the malignant component but may lead to the growth of the benign component. After that only benign mature elements left behind; tumor cell structures being altered by chemotherapy and totipotent malignant germ cell transforms into mature benign teratoma [17]. Another theory for Growing Teratoma Syndrome (GTS) is "Chemotherapeutic Reversion" of the immature teratoma cells into mature teratoma [8]. In chemotherapeutic retroconversion of immature malignant tumor, normalization of an initially raised serum tumor marker and CT features of maturation which include increased density of mass lesions, margins become better circumscribed in relation to adjacent tissues and the onset of internal calcification, with fatty areas and cystic changes [18].

Conclusion

Immature mediastinal teratoma is a rare tumor and it is different from benign teratoma. This differentiation can only be made by histological examination. CT of chest is the radiological examination tool for the diagnostic evaluation of mediastinal teratoma with tumor markers alpha fetoprotein, HCG. Combined chemotherapy with total surgical excision of tumor treatment of choice. Chemotherapeutic retroconversion is uncommon in teratoma. Confirmation by biopsy should be done for confirming the occurrence of new tumors in the follow up of patients with germ cell tumors.

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Department of Radiology and Imaging, Pathology and Oncology of Dhaka Medical College Hospital, Dhaka, Bangladesh.

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Conflicts of Interest

No conflicts of interest to disclose was declared by authors with others: 1) Registrar, Thoracic Surgery, DMCH. 2) Medical officer, Cardiac Surgery, DMCH.

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