ORIGINAL RESEARCH PAPER

Radio-Diagnosis

A LARGE MATURE MEDIASTINAL TERATOMA ON THE CT CHEST WAS TREATED WITH CHEMOTHERAPY AND SURGERY: A CASE REPORT

KEY WORDS: Chemotherapy, Mature mediastinal teratoma, Chest discomfort

Dr Manoj Kumari Katewa IDCCM Fellow Department Of Anaesthesiology The Gujarat Research And Medical Institute, Shahibag, Ahmedabad, 380004

Dr Arvind Kumar* Resident Department Of Radiodiagnosis The Gujarat Cancer And Research Institute, Asarwa, Ahmedabad, 380016 *Corresponding Author

Dr Hitesh Rajpura Head Of The Department Department Of Radiodiagnosis, The Gujarat Cancer And Research Institute, Asarwa, Ahmedabad, 380016

ABSTRACT

Background Teratomas are a type of germ layer involve one or multiple tissues derived from germinal layers They prefer gonadal regions, but they can be expected rarely in extragonadal sites such as the anterior mediastinum. Case report In this report, we discussed a 16-year-old male who experienced dyspnea and chest discomfort. A computed tomography showed a large lobulated, right-sided mass measuring about 200 x120x80 mm. patient underwent chemotherapy which was followed by surgical excision. Histopathological evaluation indicating presence of mature mediastinal teratoma.Conclusion The incidence of mature mediastinal teratoma is uncommon, Detailed evaluation studies such as radiological and pathological assessments needed for diagnosis, CT scan with contrast is the best modality for unruptured and complicated mediastinal teratomas. Most effective approach to treating mature teratomas is a combination of chemotherapy and complete surgical resection in majority of the cases.

INTRODUCTION

Teratomas were defined as true tumors consisting of tissues non native to the part of the body in which they are developed, these are type of germ cell tumor consisting of one or multiple tissues derived from cells of three germinal layers, which may contain variable amounts of mature and immature tissues. Teratomas are mostly benign and are predominantly found in gonads, however, they can be located in extragonadal sites such as the neck, retroperitoneum, sacrococcygeal region, and the thorax [1,2].

Extragonadal germ cell tumors are typically located in the mediastinum and make up 15% of all mediastinal tumors in adults [3, 4]. The majority of the mediastinal teratomas are mature and progress gradually [5]. These tumors are often asymptomatic at first, but as they enlarge, the patient may experience nonspecific symptoms like dyspnea and chest pain [6].

This study describes a 16-year-old male who had large and mature mediastinal teratoma in the right side of mediastinum, which was successfully treated with resection.

Case Study

A 16-year-old male was presented with complaining of a complaints of dyspnea, associated with on and off chest discomfort. There was no pertinent prior medical, family and psycho-social history including any genetic predisposition. No h/o prior interventions. In physical examination, the patient was afebrile with normal vital signs, and oxygen saturation of 97%. Previous HRCT showed a large soft tissue mass in the anterior mediastinum with areas of coarse calcification (130×100×78 mm), causing the shift of heart and trachea to the left side. The provisional diagnosis was reported malignant teratoma.

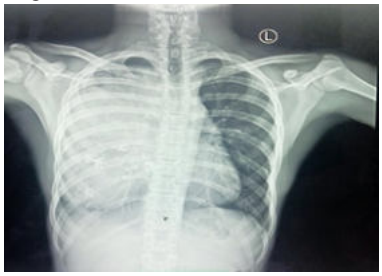

Fig 1. Frontal Chest radiograph showing Right Opaque hemithorax

Furthur, contrast enhanced computed tomography (CECT), chest x-ray and biopsy of the mass were requested. Chest x-ray demonstrated a very large mass in the right mediastinum (Fig. 1). CECT as shown in (Fig. 2), reported a distinct heterogeneous soft tissue density in the anterior mediastinum, anterior to the heart and great vessels, measuring about 200 x120x80 mm. The mass contained fat and calcification.

Additionally there are also presence of few ill-defined sclerotic lesion is noted involving D9, D12 vertebrae, manubrium of sternum along with complete wedging collapse of L4 and partial collapse of L5 vertebrae. It is probably bone metastasis but further biopsy result didn't reveal any malignant cell.

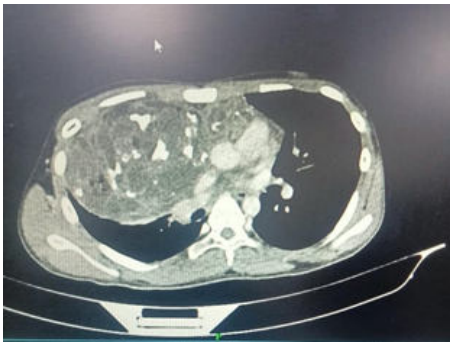

Fig 2. CT chest showing anterior mediastinal mass

The biopsy indicated the presence of mature teratoma, necessitating a more thorough evaluation follwing the surgical removal tumor. Following the tumor biopsy, the patient was referred to an oncologist for furthur evaluation and treatment. The oncologist initiated NACT(neoadjuvent chemotherapy) and the patient underwent four cycles of the BEP regimen which involved receiving intravenous Bleomycin 15mg, Etoposide 100mg and Cisplatin 10mg.

Initially laminectomy was performed at L4 vertebral level. After 4 months of surgery the patient was put under general anesthesia and had a wide local excision of Mediastinal mass.

Two chest tubes were inserted in bilateral chest. furthurmore, the mass was sent for pathological evaluation. Grossly, the tumor size measured 20x12x8 cm and appears relatively well circumscribed, multinodular capsulated, multiloculated cyst. On cut surface variegated, solid cystic, necrotic areas, cartilaginous and yellowish areas. On dissection pultaceous material came out.

In the pathological examination, tissue sample exhibits disorganised arrangement of mature epithelial and mesenchymal tissue. The epithelial component is seen as keratin cysts lined by squamous cells, containing adnexal structures and hair shaft is seen. Mucinous glands, serous glands, salivary glands are seen at places. Mesenchymal elements are seen as lobules of mature cartilage, smooth muscle fibres, bone and adipose tissue. Mature glial tissue is evident. Area of necrosis and sheets of foamy macrophages evident overall features favours mature teratoma. (Fig. 3)

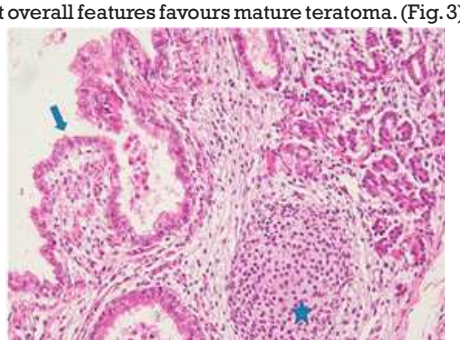

Fig. 3 Histopathology of mature component of mass: Respiratory ciliated epithelium(arrow), cartilage(star) and glands(right top).

The patient was discharged a week after the surgery in good condition. Currently, he has been under our follow-up for 6 months following the operation and there have been any signs of recurrence.

The anterior mediastinum is the most common site for extra-gonadal germ cell tumors and that teratomas are the most prevalent form of germ cell tumors seen in the mediastinum [7].

Mature teratoma of the mediastinum is a slowly growing benign tumor can either originate from thymic parenchyma or develop near the thymus [8]. The frequency of occurrence of teratomas is as described: 40% in the sacrococcygeal region, 25% in the ovary, 18% in the neck and mediastinum, 12% in the testis, and 5% in the brain tissues [9].

Mediastinal teratomas frequently consist of ectodermal tissues like teeth and hair while they may also contain mesodermal and endodermal tissues. In rare cases with the presence of immature embryonic tissue in the teratoma, these tumors are regarded as immature teratoma and the management and outcome become different from a mature teratoma [2, 10]. Due to stealthy expansion, most of the mediastinal cases remain symptomless until they exert pressure on surrounding structures. they are frequently found in chest radiographs [8]. In 60% of diagnosed cases, patients did not experience any noticeable symptoms. Individual between 20 and 40 years often experience associated symptoms [9] such as chest pain, difficult breathing, and cough [11].

Our patient reported experiencing dyspnea and chest discomfort for ten months. One of the most frequent presentations of anterior mediastinal teratomas is when they cause superior vena cava obstruction [12]. Chest CT scan is considered best modality for the diagnosing mediastinal teratoma [13, 14]. In CT scan, mature teratomas seen as a unilateral large heterogeneous mass containing fat and calcification along with areas of enhanced soft tissue or as irregular cystic tumors with thick walls and extensive hemorrhage and necrosis. (11, 15).

In our case, the results of chest X-ray and CT scan align with the diagnosis of teratoma. The impact of chemotherapy involve a reduction in tumor size, alterations in tumor markers, and presence of immature component within the tumor [16, 17]. The preferred method of treatment for non malignant is surgical removal[9].

Our patient underwent surgical resection, which has been demonstrated in previous studies to be effective in treating benign intrapulmonary and mediastinal teratomas [2, 18]. Decision to proceed with the procedure was influenced by the significant size of the mass as well as the pesence of symptoms like dyspnea and chest discomfort. Additinally during procedure, dense adhesions between tumors and surrounding tissues are observed, which ultimately influences the decision to perform a sternotomy.[14, 19, 20].

CONCLUSIONS

Incidence of mature mediastinal teratoma is uncommon, Amongst all germ cell tumors, teratomas make up the rarer subtype developing in the anterior mediastinum. The incidence of mature mediastinal teratoma is uncommon, Detailed evaluation studies such as radiological and pathological assessments needed for diagnosis, CT scan with contrast is the best modality for unruptured and complicated mediastinal teratomas. Most effective approach to treating mature teratomas is a combination of chemotherapy and complete surgical resection in majority of the cases.

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