

Case Report

Cytological Diagnosis of Mediastinal Thymoma in a 25 Year Male: A Case Report

T Santosh^{1*}, Samir Kumar Behera², and Manoj Kumar Patro²¹Department of Pathology & Lab Medicine, AIIMS, India²Department of Pathology, MKCG Medical College, India

*Corresponding author

T Santosh, Department of Pathology & Lab medicine, AIIMS, Raipur, Chhattisgarh, India, Tel: 08895495670;

Email: born_vss@yahoo.co.in

Submitted: 25 April 2016

Accepted: 10 June 2016

Published: 14 June 2016

Copyright

© 2016 Santosh et al.

OPEN ACCESS

Keywords

- Thymoma
- Anterior mediastinum
- Fine needle aspiration

Abstract

Introduction: Thymoma is a rare benign tumor with a largely indolent growth pattern. Anterior mediastinal mass is the commonest clinical presentation. It is to be distinguished from invasive thymoma i.e. thymic carcinoma by the presence of cellular features of malignancy and a greater incidence of local invasion and embolic metastases.

Case presentation: We report a case of thymoma in a 25 year male who presented with chest pain. CT scan showed a mass in anterior mediastinum. Guided fine needle aspiration was done to arrive at a diagnosis.

Conclusion: Thymic epithelial neoplasm constituents: Thymoma, Thymic carcinoma and Thymic carcinoma. These are sensitive to both chemo and radiotherapy. A cytological diagnosis of thymoma is extremely challenging. In part, this is because the tumor is uncommon and aspirates are infrequently encountered, epithelial cells may be difficult to recognize in lymphoid rich smears and there is inherent sampling error in a tumor that frequently displays heterogeneous histopathology.

ABBREVIATIONS

TEN: Thymic Epithelial Neoplasm; FNAC: Fine Needle Aspiration Cytology; LDH: Lactate Dehydrogenase; ESR: Erythrocyte Sedimentation Rate; H&E: Hematoxylin and Eosin; EMA: Epithelial Membrane Antigen; CD: Clusters of Differentiation; CK: Cytokeratin; PNS: Para-Neoplastic Syndrome; CT: Computerized Tomography; MGG: Mac-Grunwald Giemsa; MG: Myasthenia Gravis; TDT: Terminal Deoxynucleotidyl Transferase

INTRODUCTION

Thymic epithelial neoplasms are commonly encountered in the 4th-5th decade of life. They are exceedingly rare in children or adolescent age group [1]. Overall incidence is about 1-5 per million populations [2]. Thymoma is primary mediastinal neoplasms that either arise from or differentiate toward thymic epithelial cells admixed with non-neoplastic lymphocytes [3]. Thymoma can be benign or malignant. Cytologically benign thymoma's have been classified as benign lymphocyte rich, epithelial cell rich or spindle cell type [4]. Fine needle aspiration cytology (FNAC) and CT guided core needle biopsy plays a significant role in the diagnosis of anterior mediastinum masses contributing to early management and choice of optimal therapeutic manipulation [5]. The cytological diagnosis of thymoma can be extremely challenging.

Here we report a case of thymoma diagnosed on FNA in a 25 year old male presenting with a mediastinal mass.

CASE PRESENTATION

A 25 year old, male presented with complaints of weakness, anorexia, weight loss, irregular fever, chest pain, cough and respiratory distress since last 3 months. Physical examination revealed paleness, tachypnea and decreased breath sound. Lab investigations revealed anemia (Hb: 7gm/dl), raised ESR (82mm/hr), elevated LDH (520 U/L). Mantoux test was negative. Chest X-Ray revealed a huge mass in anterior mediastinum. USG and CT scan of Abdomino-pelvic organs was normal. CT scan of thorax showed the mass of size 15×13×12 cm which was extending up to the superior mediastinum (Figure 1). Ultrasound guided FNA from the mass yielded blood tinged material. Smears were air dried and stained with MGG. It was also fixed in 95% alcohol, stained with H&E. Smears were hypocellular showing a mixed population comprising of epithelial cells and lymphocytes. The epithelial cells were present in clusters with mild variation in shape and size, while the lymphocytes were dispersed among the epithelial cell clusters in a necrotic background (Figure 2). A cytological diagnosis of thymoma was given. Later a biopsy from the mediastinal mass showed features of Thymoma (B2 subtype) and confirmed by immunohistochemistry.

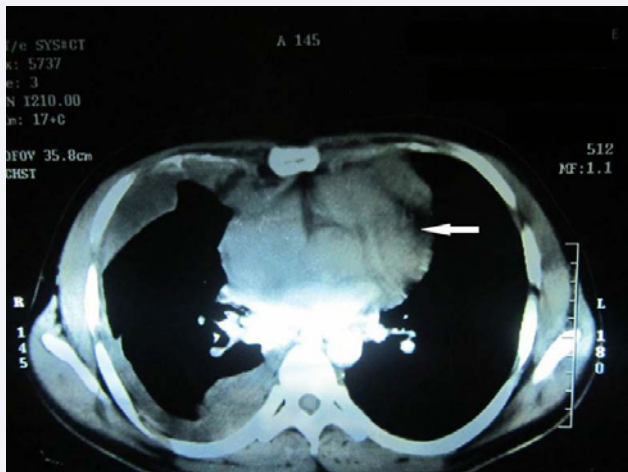


Figure 1 CT Thorax revealing an anterior mediastinal mass displacing trachea.

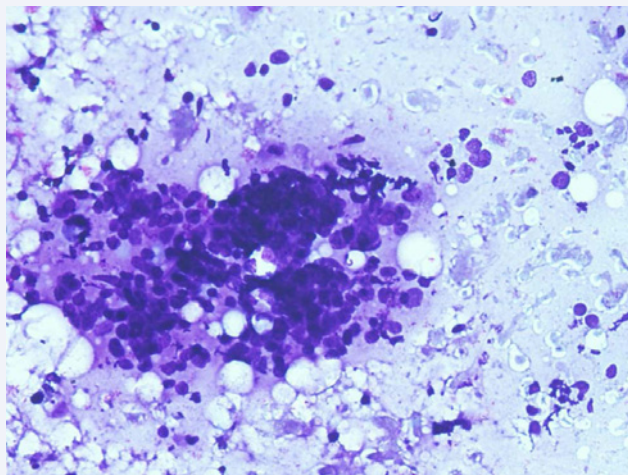


Figure 2 Epithelial cells are present in clusters with mild variation in shape and size, along with lymphocytes dispersed among the epithelial cell clusters in a necrotic background (Diff Quik 40X).

DISCUSSION

Thymoma is a rare primary tumor of the epithelial cells of thymus and also the most common tumor of the anterior-superior mediastinum. Thymoma in childrens and adolescent age group is very rare. Its incidence increases with age (70% of cases observed in patients beyond age of 40). Overall incidence is about 1-5 per million populations and 1.5% of mediastinal masses in children [4,5].

Thymoma are usually asymptomatic or accompanied with atypical clinical symptoms such as cough, chest pain, dysphagia and dyspnea or may be associated with a wide variety of PNS syndrome such as Myasthenia Gravis, Pure Red Cell hypoplasia or Pancytopenia [2,6]. Thymoma can exhibit a spectrum of autoimmune phenomenon comprising of neuromuscular, hematopoietic, dermatologic, rheumatic, vasculitis, hepatic and renal diseases [3]. These neoplasms are composed of a mixed population of cells such as epithelial cells and lymphocytes. Only

epithelial cells show neoplastic features. They may be round, oval or spindle-shaped and tends to occur in tightly knit clusters. The lymphocytes are predominantly of the T-type originate in bone marrow and are diffusely distributed. In 40% of cases the tumors are predominantly lymphocytic, in 20% they are mixed and the rest are predominantly of the epithelial type [6]. The vast majority of thymoma's do not present considerable atypia or anaplasia. In 90% of cases they are well encapsulated and multilobulated while in 10% a rupture of the capsule and invasion to the adjacent tissues are observed.

The nomenclature of the major thymoma subtypes is based on letters and numbers (type A, AB, B1-3) is followed, as was the recommendation by modified Masaoka-Koga system [7]. Thymoma should be differentiated from other anterior mediastinal neoplasms with epithelial and/or lymphoid differentiation, including Non Hodgkin Lymphomas and Hodgkin Lymphomas, thymic carcinomas and germ cell tumors [1]. The biological behaviour of thymomas is unpredictable. Extrathoracic metastasis are rare involving the cervical lymph nodes and liver. The stage of tumor at the time of diagnosis and the adequacy of the surgical excision are among the factors that influence the outcome of these tumors. The presence of clinical symptoms, large tumor size, local invasion or metastasis at the time of the surgery and predominant epithelial features are poor prognostic factors [8]. Majority of non-neoplastic lymphocytes showed an immuno-phenotype characteristic of immature T cells (TdT, CD3+, CD5+, CD1a+, CD99+, Ki67 proliferation index > 80%) while neoplastic epithelial cells showed expression of AE1/AE3 and CK 7+/20- at the stromal interface [7,9].

Cisplatin-based combination chemotherapy is recommended. Radiotherapy is also effective for both primary (non-resectable) and loco-regional recurrent thymic carcinoma. Combination chemotherapy with cisplatin/etoposide and concurrent radiotherapy is considered a reasonable treatment approaches. Although high-grade tumors including undifferentiated carcinoma have been reported to behave aggressively (average survival 15 months) and have a very poor prognosis but in most cases initial chemo-radiotherapy is effective which prolongs survival of such patients with thymic carcinoma [2].

CONCLUSION

FNA biopsy of thymic epithelial neoplasms remains an underutilized method of sampling mediastinal masses compared with its application in other body sites. A specific cytological diagnosis of thymoma is possible when the aspirate contains a dual population of proven epithelial cells and lymphocytes in the correct clinical-radiologic context. Combination of chemotherapy and radiotherapy provides a reasonable treatment approach.

REFERENCES

1. Alexiev BA, Drachenberg CB, Burke AP. Thymomas: a cytological and immunohistochemical study, with emphasis on lymphoid and neuroendocrine markers. *Diagn Pathol.* 2007; 2: 13.
2. Engels EA, Pfeiffer RM. Malignant thymoma in the United States: demographic patterns in incidence and associations with subsequent malignancies. *Int J Cancer.* 2003; 105: 546-551.
3. Hammond EH, Flinner RL. The diagnosis of thymoma: a review.

- Ultrastruct Pathol. 1991; 15: 419-438.
4. Grosfeld JL, Skinner MA, Rescorla FJ, West KW, Scherer LR 3rd. Mediastinal tumors in children: experience with 196 cases. *Ann Surg Oncol.* 1994; 1: 121-127.
 5. Yaris N, Nas Y, Cobanoglu U, Yavuz MN. Thymic carcinoma in children. *Pediatr Blood Cancer.* 2006; 47: 224-227.
 6. Pantidou A, Kiziridou A, Antoniadis T, Tsilikas C, Destouni C. Mediastinum thymoma diagnosed by FNA and ThinPrep technique: a case report. *Diagn Cytopathol.* 2006; 34: 37-40.
 7. Marx A, Chan JK, Coindre JM, Detterbeck F, Girard N, Harris NL, et al. The 2015 World Health Organization Classification of Tumors of the Thymus: Continuity and Changes. *J Thorac Oncol.* 2015; 10: 1383-1395.
 8. Moore KH, McKenzie PR, Kennedy CW, McCaughan BC. Thymoma: trends over time. *Ann Thorac Surg.* 2001; 72: 203-207.
 9. Chung DA. Thymic carcinoma--analysis of nineteen clinicopathological studies. *Thorac Cardiovasc Surg.* 2000; 48: 114-119.

Cite this article

Santosh T, Behera SK, Patro MK (2016) Cytological Diagnosis of Mediastinal Thymoma in a 25 Year Male: A Case Report. *Ann Clin Cytol Pathol* 2(3): 1027.