

Case Report

PRESENCE OF LARGE BILOBED THYMUS IN ADULT MALE CADAVER

V.N.Susimitha Sri ^{*1}, V.Anitha ².

^{*1} IInd year MBBS, ² Associate professor.

Department of Anatomy, Kanyakumari Government Medical College, Asaripallam, Nagercoil. India.

ABSTRACT

Introduction: Thymus is an asymmetrical bilobed mass of lymphoid tissue. It is the most important component of superior mediastinum. Embryologically it develops as a bilobed structure from the third pharyngeal pouches of embryo in common with inferior parathyroid gland. It is clinically important for differential diagnosis of radiological review of mediastinal mass. Its persistence in adults, its embryological and anatomical features are necessary before doing any invasive procedures.

Materials And Methods: The study was carried out on six embalmed formalin fixed cadavers of known age and sex in Anatomy Department of Kanyakumari Government Medical College, Nagercoil, Tamilnadu. A large bilobed thymus was found in a 40 year old male cadaver.

Result And Conclusion: Thus we found a large bilobed thymus in 40 year old male cadaver. This fact is clinically important for radiologist to make differential diagnosis in case of mediastinal mass. A thorough knowledge of embryology and anatomy of the thymus, normal variations and ectopic location of thymus and its dynamic changes is necessary before doing any therapeutic, diagnostic and invasive procedures.

KEYWORDS: Lymphoid organ, Puberty, Involution, Mediastinum, Persistence.

Address for Correspondence: V.N.Susimitha sri, IInd year MBBS, Department of Anatomy, Kanyakumari Government Medical College, Asaripallam, Nagercoil-629201, India.

E-mail: srisusimitha@gmail.com

Access this Article online

Quick Response code



Web site: International Journal of Anatomy and Research
ISSN 2321-4287
www.ijmhr.org/ijar.htm

Received: 02 Aug 2014

Peer Review: 02 Aug 2014 Published (O): 30 Sep 2014

Accepted: 23 Aug 2014 Published (P): 30 Sep 2014

INTRODUCTION

Thymus is the primary lymphoid organ develops from the epithelial cells derived from the endoderm of the third pair of pharyngeal pouches [1]. It is a bilobed mass present in the superior and anterior mediastinum behind the sternum and anterior to the heart. Embryologically they develop as a two separate organs and fuse in the midline. Early in life it is quite large and plays an essential role in the development of immune system. It descends from neck to thorax. It weighs about 10-15g at birth and it progressively increases in size and weighs to about 20-30g at puberty. Then it undergoes involution [2]. By adulthood it is often scarcely recognisable because of fat infiltrating the

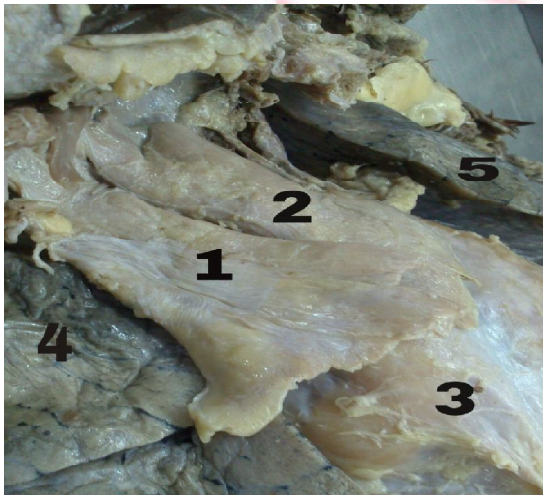
cortex of the gland, however it is still functional and important for the maintenance of health. Thymus, as it is a primary lymphoid organ, primes thymocytes before releasing them to the periphery [1]. Thymus is the first lymphoid organ to be developed. Normal peripheral lymph nodes depend on seeding by small lymphocytes from the thymus [3]. Thymus development also depends on direct interaction of mesenchymal derivatives of the neural crest with pharyngeal epithelium [4]. The rate and extent of its involution are very variable [5]. Thymus involutes very gradually with age. Acute shrinkage of thymus occurs in conditions such as stress, infection, pregnancy, malnutrition, surgery, chemotherapy and malignancy [6].

During neonatal and perinatal life it is essential for normal immune development. A reduction in thymic function results in greater susceptibility to tumours, growth disorders, rheumatic disease [2]. Thymic dysfunction leads to diseases such as Myasthenia Gravis. During thymic development variations like ectopic thymuses were observed.

CASE REPORT:

During routine dissection of thorax in Kanyakumari Government Medical College, Nagercoil, Tamilnadu, a large bilobed thymus was found in a 40 year old male cadaver. The dissection was done as follows: A long vertical incision was made over the anterior thoracic wall from the suprasternal notch to the xiphoid process. The skin over the thorax was reflected and the fascia was cleared. The pectoralis major muscle was exposed. The pectoralis major and pectoralis minor muscle were reflected. The thoracic cage was now exposed. Cuts were made at the costochondral junctions to expose the thoracic cavity. The fascia over the anterior mediastinum was cleared and a large bilobed thymus was found.

Fig. 1: Anterior view of Thymus:



1. Right lobe of thymus, 2. Left lobe of thymus, 3. Heart and Pericardium 4. Right Lung, 5. Left Lung

Observation were made as follows:

- A large bilobed thymus extending from the lower pole of thyroid gland to the pericardium of anterior mediastinum.
- The gland was flat and yellowish because of the fatty change

The gland showed following relations:

Superiorly – Thyroid gland

Anteriorly – Sternal surface

Posteriorly – Aortic arch, pericardium

Laterally - Right and Left lobes of lung

Inferiorly - Pericardium.

Histological observations of It revealed as thymic tissue.

EMBRYOLOGY:

Thymus develops from the ventral elongated part of the third pharyngeal pouch [1]. It develop as a bilateral structure in common with inferior parathyroid gland [5]. Subsequently, it descends with pericardium from the neck into the thorax [5]. The advancing distal ends of the primordium meet and fuse at the level of superior margin of the aortic arch. This midline fusion affect only the connective tissue, the parenchyma does not fuse [3]. In the fetus and newborn the thymus is nearly as large as heart. It continues to grow upto puberty [5]. Initially thymic primordium is connected to pharynx by thymopharyngeal duct. After fusion the cephalic portion lose its connection with pharynx and disappears. The distal end enlarges progressively to form the thymus gland. Eventually the thymopharyngeal duct disappears [3]. As both lobes develops independantly, each lobe has its own seperate blood supply, lymphatic supply and nerve supply [1].

DISCUSSION

Thymus appears in a variety of shape and size even in same individual. This is due to acute shrinkage of thymus during bodily stress. During recovery period, it grows back to its original or even larger size. This phenomenon is known as thymic rebound hyperplasia. These anatomic variation and dynamic changes appears as main source of confusion. These misinterpretations with pathological condition leads to prolonged chemotherapy or radiotherapy or unnecessary biopsy. Thus it sets a major confusion for radiologist [6].

Haynes et al and his colleagues described about the role of thymus in immune reconstitution in aging, bone marrow transplantation, HIV-1 infection. The emerging concept is the age

dependant contribution of thymic emigrants. Thymus optimizes the peripheral T cell pool in older age group by peripheral T cell expansion and maintain the immune system. Thus thymus functions well even in sixth decade of life to optimize the human immune system function [7]. Studies of Yasumasa Monden, et al., proposed that 63% (44% males and 19% females) of myasthenia gravis patients have thymomas. Scientist believed that thymus gland may give incorrect instructions to developing immune cells, ultimately resulting in autoimmunity and the production of acetylcholine receptor antibodies. Thymectomy in those myasthenia gravis population have great prognosis [8].

Benign thymic enlargement in adult after chemotherapy was described by Kissin and et al. Treatment of malignant testicular teratomas with chemotherapy shows thymic enlargement. These enlargement represents true thymic hyperplasia. This rebound thymic hyperplasia in adults appears as an mediastinal mass in CT tomography. This is a benign enlargement [9].

As described by Jaretzki III, et al., 8 out of 22 patients (82%) had surgically important variations in thymic anatomy in neck, mediastinum or both, variation such as thymus above thyroid, accessory thymus, accessory cervical locations, pole variations, abnormal cervical location, abnormal mediastinal locations especially posterior mediastinal locations were reported. Surgeons dealing with mediastinal should have a better knowledge about these variations [11,13].

Abnormal location of thymus gland were occur due to maldescent of the thymus gland during embryological life. These may be unilateral or even bilateral, may or may not involve the cardiac anomalies and other anomalies¹². Maldescent is sometimes may be because of failure of migration of neural crest cell derivatives. This study was proved in chick embryo [4].

Thymus in adult life may be normal or abnormal. The prepubertal thymic glands were pyramidal in shape. Post pubertal thymus were flattened. Prepubertal thymus were pink grey to brown colour while postpubertal thymus varied from white grey to yellow. These morphological

features of human thymus gland were important [10].

Prevalance of large anterior mediastinal thymus is also reported in 65 year old male cadaver. Thus a thorough knowledge of dynamic changes, ectopic location and normal variation of thymus is necessary before doing any invasive procedures [2].

CONCLUSION

Thus thymus shows morphological changes in gross anatomy. This fact is clinically important for radiologist to make differential diagnosis in case of mediastinal mass. Surgeons may called upon to deal with main lesions in mediastinum to deal with pathology in one of the organs contained with mediastinum. Dynamic changes in thymic tissue during the life time is necessary to differentiate pathological mediastinal mass from benign enlargements. A thorough knowledge of anatomy and embryological changes of thymus, its normal variations, ectopic locations and dynamic changes is necessary before doing any therapeutic, radiotherpic or invasive procedures.

Conflicts of Interests: None

REFERENCES

- [1]. Keith L Moore, T.V.N Persaud. The Developing Human, Clinically Oriented Embryology, 6th edition ch-10, pg-223.
- [2]. Sapne Shevade, Dr. Jyoti kulkarni. Persistent Enlarged Thymus in an adult male cadaver. IOSR Journal of Dental and Medical Sciences. ISBN:2276-0861. Vol2, Issue4 2012. pp 34-35.
- [3]. John E skandalakis. Surgical Anatomy. The embrological and Antomical Basis of Mordern Surgery. Vol 1, ch 4, pg:217-228
- [4]. Bockman DE, Kirby ML. Dependence of thymus on derivatives of the neural crest. Science 1984;223:498. [pubmed]
- [5]. G.J. Romanes. Cunningham's manual of Practical Anatomy. Vol2, ch1, pg39.
- [6]. Farbood Nasser, Farzin Eftekhari. Clinical and Radiological review of the normal and abnormal thymus: Pearls and Pitfalls. Radiographics. March 2010;30(2):413-28 [pubmed]
- [7]. Haynes BF, Markert ML, Sempowski GD, Patel DD, Hale LP. The role of thymus in immune reconstitution in aging, bone marrow transplantation and HIV-1 infection. Annual Reviews of Immunology. 2000;18:529-60. [pubmed]
- [8]. Yasumasa Monden, Kazuya Nakahara, Katsumi Kagotani, Yoshitaka Fujii, Akira Masaoka and

- Yasunaru Kawashima. Myasthenia gravis with Thymomas: Analysis of and postoperative Prognosis for 65 patient with Thymomatous Myasthenia Gravis. The Annual of Thoracic Surgery 1984;38:46-52.
- [9]. Kissan CM, Husband JE, Nicholas D, Eversmn W. Benign thymic enlargement in adult after chemotherapy: CT demonstration. Radiology. 1987 Apr;163 (1):67-70.[pubmed]
- [10] Krishna Murthy,V.Subadra Devi. Morphological features of human thymus gland from foetal to old age. International journal of biological and medical research. 2010; 3(2) :1502-1505.
- [11]. Ronald A Bergman, Adel K. fifi, Ryosuke Miyauchi. Illustrated Encyclopedia of Human Anatomical Variation: Opus IV: Organ system: Endocrine system. Thymus.
- [12]. Patricia M. Bale and Cirilo sotel Avil. Malescent of thymus: 34 necropsy and 10 surgical cases including 7 thymuses medial to mandible. Fetal and paediatric pathology. 1993;13(2):181-190.
- [13] Sushmita Bhatnagar, Rohit Pradhan, Pankj Shastri, Pradeep Shenoy. Accessory thymus in posterior mediastinum. J Indian Assoc Paediatric Surgery/ Oct-2008; 13(4): 140-141.

How to cite this article:

V.N.Susimitha Sri, V.Anitha. PRESENCE OF LARGE BILOBED THYMUS IN ADULT MALE CADAVER. Int J Anat Res 2014; 2(3): 541-544.

