IJCRR
Vol 04 issue 24
Section: Healthcare
Category: Research
Received on: 07/11/12
Revised on: 20/11/12
Accepted on: 01/12/12

A STUDY ON HISTOMORPHOLOGICAL FEATURES OF PERSISTENT ADULT HUMAN CADAVERIC THYMUS

Raju Sugavasi, Indira Devi B., Sujatha M., Udaya Kumar P., Kanchana Latha G.

Department of Anatomy, RIMS Medical College, Rajiv Gandhi Institute of Medical Sciences, Kadapa, A.P., India

E-mail of Corresponding Author: anatraju@yahoo.co.in

ABSTRACT

The thymus is an encapsulated soft bilobed organ lies in the superior mediastinum and anterior part of the inferior mediastinum. Presence of Enlarged thymus in adult is not so common because thymus size and parenchyma gradually atrophies after puberty finally replaced by fibro fatty mass. **Objectives:** To Study the Histo morphology of the bilobed enlarged thymus in adult human cadaver. **Materials and Methods:** Collected persistent enlarged thymus in adult human cadaver then performed histological staining to study the parenchyma. **Conclusion:** we discussed morphological and histological facts about the present study. This study is clinically important for radiologists to make a differential diagnosis in case of a mediastinal mass.

Keywords: Cortex, Hassall's Corpuscle, Thymus, Radiologists

INTRODUCTION

Thymus is made up of two pyramidal lobes, the two parts being joined in the midline by connective tissue that merges with the capsule of each lobe. It is located in the mediastinum behind the sternum and in front of the pericardium and great vessels of the heart in the adult. Thymus plays a significant role in the early development of immune system and function, as T lymphocytes develop and maturation takes place within it [1]. The gross appearance and size of thymus varies with age and physiological state. During neonatal and postnatal life thymus is essential for the normal development of lymphoid tissue [2]. Thymus is fully developed at birth itself then it undergo changes gradually as the age proceeds, these gross changes have been reported to start between 11-15 years [3]. The weight of thymus is about 40g at puberty then gradually atrophies to 10-15g later life finally majority of the parenchyma have been replaced by connective tissue and adipose cells [4]. As the growth of adipose tissue increases within perivascular space, so the volume of thymic epithelial space reduces, leads to less thymopoisis [5]. Increased incidence of serious infections in old age has been related with decreased thymic function [6].

MATERIALS AND METHODS

The present work was conducted in the Department of Anatomy, Rajiv Gandhi Institute of Medical Sciences, Kadapa, Andhra Pradesh, India. This Study was conducted on enlarged thymus in 70 years old female cadaver (FIGURE: 01). The morphometry of reported thymus was consists of two lobes which was seen anterior to pericardium. The gland was seen to be extending from the neck below the thyroid gland into the superior and anterior mediastinum. The length, width of the gland measured as 13 cms, 3cms. We performed histological procedure to study the parenchyma of the gland after fixation, paraffin embedding, then taken Sections of 5microns thickness were stained with haematoxylin and eosin and examined the structure of adult

enlarged thymus under 10x and 40x magnifications using a Binocular microscope. This histological study is taken into consideration due to poor literature availability.

RESULTS

Histological Observations

In the present histological study of adult thymus found to be like its normal structure but observed some aging changes like increased capsular thickness, separation between lobules are not well demarked and interlobular septa was disappeared. The number of Hassal's corpuscles was less but found the larger size in diameter. Parenchyma arranged as small islands between replaced connective and adipose tissue (FIGURE: 02).

DISCUSSION

Thymus descent from 3rd branchial arch during the 6th week of intra uterine life, epithelial out pouching from the ventral aspect of 3rd branchial arch starts to develop and move caudally forming a thymo pharyngeal duct. There was a very minor and rudimentary portion of thymic tissue which develops from ventral aspect of 4th pouch. Descent of heart and caudal migration of aortic sac lead to caudal migration of thymic rudiments. Occasionally thymus may persistent in adults.

Reduction in the parenchyma of the gland and by middle age most of it has been replaced by fat although functional thymic tissue is found until 6th decade of life [7]. According to knowledge of previous published literature on rat and other animal experiments reveals that progressive increase in amount of connective tissue and fat cells between thymic lobules was found with advancing age [8]. Disappearance of septa, attrition of demarcation between cortex and medulla while loss of septa with increased fatty infiltration in aging rats was also a main feature of another study [9, 10]. Previous histological studies of rat thymus reported that there is decrease in number of Hassal's corpuscles with aging [11].

A histological study conducted on 40 human thymuses to compare different with ages reported that, in old age, there is definite increase in the thickness of capsule and interlobular connective tissue with Hassal's corpuscles decreasing in number but increasing in diameter [12].

CONCLUSION

In the present study, the histolomorphology of persistent adult thymus is similar and support to the previous reported literatures. Present study is important for radiologists to make a differential diagnosis in case of a mediastinal mass.

AKNOWLEDGEMENTS

I am greatful to Dr. Kanchana latha, HOD of Anatomy Department and also previous authors, publishers, editors of all of those articles, journals and books from where the literature of this article has been reviewed and discussed.

REFERENCES

1. PickerL, Siegleman M. in:Paul, WE, editor. Fundamental immunology. New York: Raven Press. 1993; 145-97.
2. Krishna Murthy JV, V. Subhadra Devi. Morphological features of human thymus glands from foetal to old age. Int J Biol Med Res. 2012; 3(2): 1502-1505.
3. Kendall, M.D., Johnson, H. and Singh, J. The weight of the human thymus gland at necropsy. J Anat. 1980; 131: 485-99.
4. Don W. Fawcett, Ronald P. Jensh, Bloom & Fawcett's Concise Histology, 2 edition, Ch-10, Pg – 153.
5. Flores, K.G., Li, J., Sempowski, G.D., Haynes, B.F. and Hale, L.P. Analysis of human thymic perivascular space during aging. J Clin Invest. 1999; 104: 1031-9.
6. Hale, Laura. P., Amy G. Clark, Jie Li., Paula, K. Greer and Virginia Byers Kraus.). Age related thymic atrophy in the guinea pig. Developmental and comparative immunology. 2001; 25: 509-18.

7. Haynes, B.F., Markert, M.L., Sempowski, G.D., Patel, D.D. and Hale, L.P. The role of thymus in immune reconstitution in aging, bone marrow transplantation, and HIV-I infection. Ann. Rev. Immunol. 2000; 18: 529-60.
8. Elcuman, E.A., and Akay, M.T. Age dependent immunolocalization of fibronectin and histological changes in the thymus of rats. Veterinary research communications. 1998; 22: 8: 525-32.
9. Smith, S.M. and Gomez-Ossa, L.J. A quantitative histologic comparison of the thymus in 100 healthy and diseased adults. Am J Clin Pathol. 1981; 76: 5: 657-65.
10. Majeed, N., Fatani, J.A., Moustafa, F.A. and Mohajir, A.M. Reappraisal of age-related morphological changes in the rat thymus-morphometric study. Funct Dev Morphol. 1991; 1: 2: 57-60.
11. Majeed, N., Fatani, J.A., Moustafa, F.A. and Mohajir, A.M. Reappraisal of age-related morphological changes in the rat thymus-morphometric study. Funct Dev Morphol. 1991; 1: 2: 57-60.
12. Shafqat Ali, Liaqat Ali Minhas, Muhammad Arshad. Histological comparison of human thymus glands between groups of different ages. Pakistan armed forces medical journal. Dec. 2009 (5).

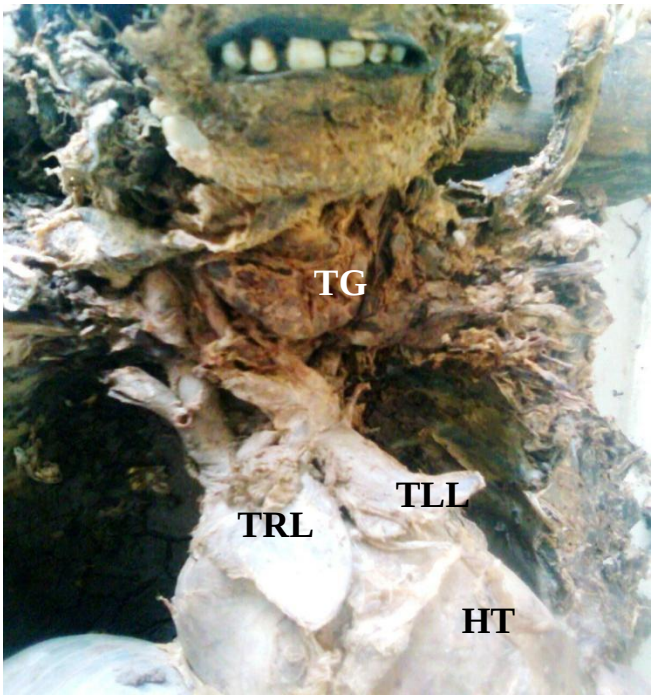

Figure: 1 Shows TG: Thyroid gland, HT: Heart, TRL: Thymus Right lobe, TLL: Thymus left lobe.

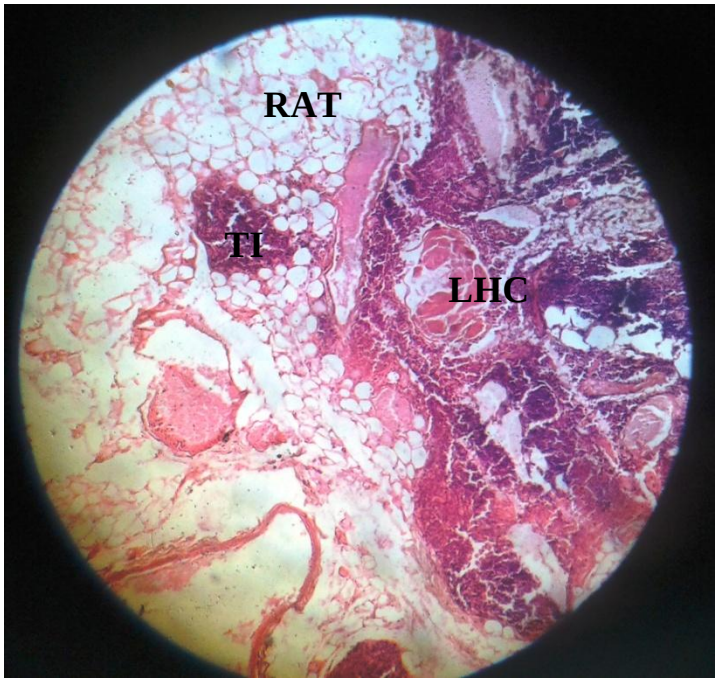

Figure: 2 Histology of adult thymus Shows LSHC: Larger Size Hassal's Corpuscles. RAT: Replaced Adipose Tissue, TI: Thymic Island.