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ROLE OF VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) IN THYMECTOMY FOR MYASTHENIA GRAVIS

Thesis

Submitted to the Faculty of Medicine,

Alexandria University

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MASTER OF GENERAL SURGERY

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Preface

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Introduction

THYMUS

Origin:

The thymus, a key immune system organ, is the first developing lymphoid organ. In mammals it develops from the ventral portion of the third branchial pouch (endodermal epithelium) in close association with the inferior parathyroid gland.

A portion of the thymic primordium may also develop from the fourth branchial pouch in association with the superior parathyroid gland at about the sixth gestational week. [1, 2]

The thymic primordium pinches off from the ventral portion of the third branchial pouch as thymopharyngeal duct that elongates caudally and antromedially during the seventh to the eighth gestational week. The advancing distal ends of the primordia meet and fuse at the level of the superior margin of the aortic arch.

After fusion, the distal ends of the thymus enlarge while the cephalic ends lose their connection with the pharynx and disappear during the eighth gestational week leaving a definitive thymus in the superior mediastinum. [3, 4] Fig 1

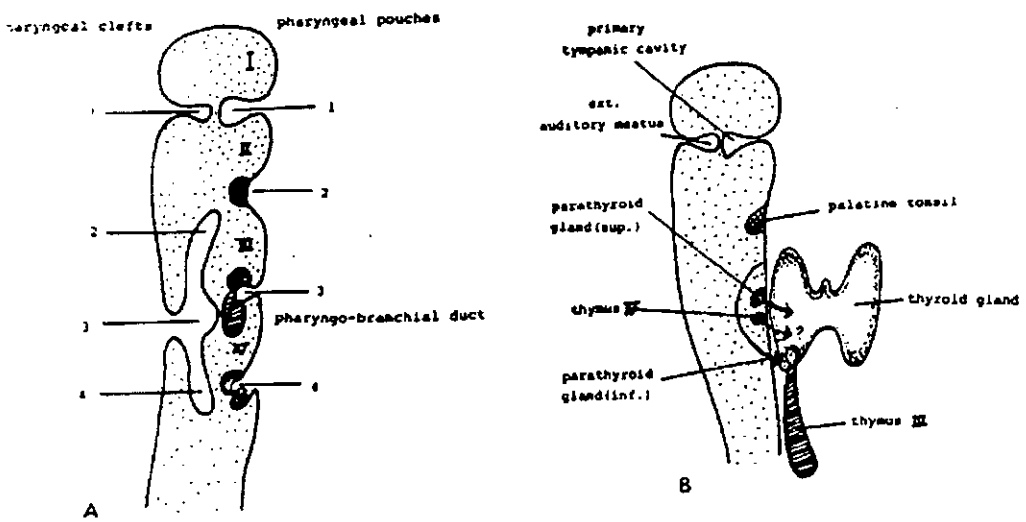

Figure (1): A, primordial stage showing nearly development of the thymus gland from the branchial pouch. B, Definitive form showing later embryonic development of the thymus gland. From reference [1].

Anomalies:

1-Thymic agenesis:

Autosomal recessive disease often associated with agenesis of the parathyroid glands (DiGeorge syndrome) which leads to early death from infections, hypocalcemia or cardiac defects. Thymus and parathyroid transplant are the only possible treatment.[5]

2-Thymic dysplasia:

Small thymus (less than 5gm) with only reticular cells and large lymphocytes, without small lymphocytes and Hassall's bodies. Usually associated with immunodeficiency disorder, e.g.; severe combined immunodeficiency, ataxia-telangectasia syndrome and related chromosomal instability syndromes, incomplete form of DiGeorge syndrome. Thymus and fetal liver implants to reconstitute T-cell and B-cell has met with some success. [6]

3-Cervical thymic cysts:

Develop from persistent remnants of the tubular end of the primitive organ. It is an extremely rare clinical condition. [7-9]

4-Undescended thymus:

Can be bilateral, but it is more commonly unilateral on the left side. [10]

5-Accessory thymic tissues (ectopic thymus):

The complex migratory pattern of the thymus is thought to be responsible for finding ectopic thymic tissues that break off during its descent into the thorax.

It can be found in relation to the left main bronchus, hilum of the lung, pleura, thyroid and parathyroid glands.

Actually gross or microscopic ectopic thymic tissues could be found any where between the hyoid bone and the diaphragm. [11, 12] (Fig 2) It is estimated that ectopic thymic tissue is common in humans (25% of the population). Ectopic thymic tissue in the skin of the neck can be a clue to the diagnosis of the branchio-scapulo-facial syndrome. Resection of these ectopic foci affects the clinical outcome after thymectomy for myasthenia gravis (MG). [13]

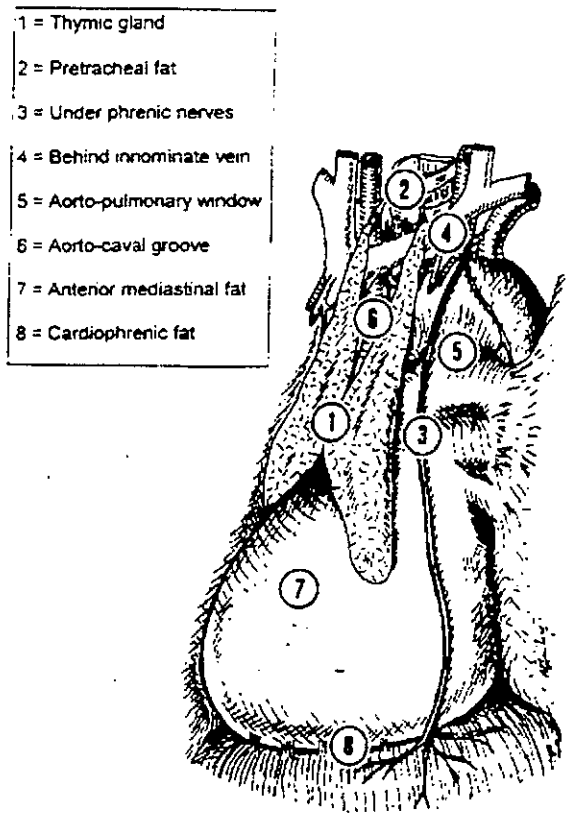

Figure (2): Diagram illustrating potential sites of ectopic thymic tissues. [13]

6-Ectopic tissues:

Sometimes found in a normally located thymus include parathyroid gland (common embryogenesis) and sebaceous glands.

Surgical anatomy:

The thymus is an H-shaped gland with variable fusion of the right and left lobes at about the midportion of the gland. The superior poles are thinner than the inferior poles with connection to the thyroid gland as thyrothymic ligament.

In adults it is an elongated lobulated pinkish yellow structure comprising thymic tissue and fat, situated in the antrosuperior mediastinum extending in the midline from the level of the fourth costal cartilage below to the level of the inferior border of the thyroid gland above but occasionally its cranial limit extends over the thyroid gland.

Anteriorly it is related to the sternum, adjacent parts of the upper four costal cartilages, sternothyroid and sternohyoid muscles.