Medicine for Managers

Dr Paul Lambden BSc(Hons) MB BS BDS(Hons) FDSRCSEng MRCSEng LRCPLond DRCOG MIHSCM

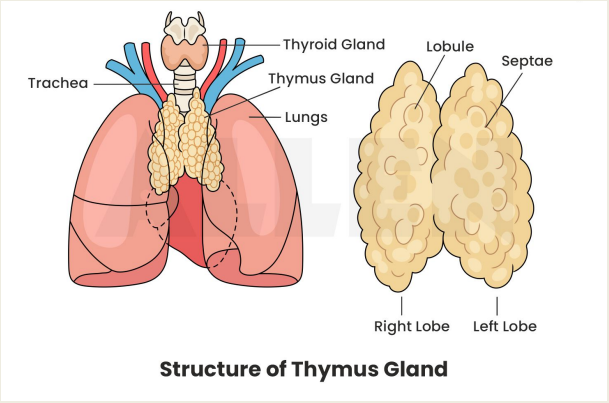
The Thymus Gland

The thymus gland is a very important structure of which we have all heard but of which hardly anyone knows the location and even fewer know what it does. It is in fact a small gland, and in children is about 5cm by 2.5 cm and weighs about 50 gm. It is located in the upper front part of the chest behind the breast bone and is composed of two lobes.

Each lobe of the thymus is divided into multiple lobules and each consists of an outer ***cortex*** and an inner ***medulla***.

In children from birth to adolescence it is a large and highly active gland, composed of specialised cells and lymphoid tissue. After puberty the gland gradually shrinks, a process termed ***involution***, and the glandular tissue is steadily replaced by fatty tissue.

In an old person the gland is small and weighs only about 5 to 15 gm.



Structure of Thymus Gland

Function of the thymus

The gland plays a crucial role in the development and function of the ***immune system.*** It produces cells called ***T-lymphocytes***, a type of white blood cell central in the immune system. The cells actually originate in bone marrow and migrate to the thymus.

Once there, the cells, also known as ***thymocytes***, mature and undergo amazing developmental changes. The thymus manages the maturation and the cells undergo, either ***positive selection***, to ensure they recognise foreign antigens, or ***negative selection***, to ensure that they do not attack the body's own tissues.

Once the cells produced by the thymus have matured, they enter the blood stream and in particular the lymphatic system where they defend the body against infection and other diseases including cancers.

The thymus is also an ***endocrine gland*** (one of ten glands in the body which produce hormones secreted directly into the blood). The thymus

produces hormones which control the production and maturation of T-cells, influences pituitary gland function and supports specialised T-cell production.

Abnormalities of the thymus can compromise immunity or result in auto-immune diseases like ***myasthenia gravis***. Tumours of the thymus can also disrupt its function.

Recent Research

The value of the thymus gland has been underrated for generations but American studies by Professor Aerts at Harvard and his co-workers have discovered that the gland is hugely more important than previously thought.

They discovered:

- Patients who had their thymus removed died earlier and had a greater risk of cancer compared to control individuals.
- The thymus varies in the quality of its operation. They designed a 'score' based on CT-scanning to assess function, and rated people as bottom 25%, middle 50% and the top 25%. Over a twelve-year period their study showed that people in the top tier were 50% less likely to die, had a 63% lower risk of cardio-vascular disease and a 36% lower risk of developing lung cancer, compared to people in the bottom tier.

Clearly these amazing findings are only the start of a vast research programme to elucidate the mysteries of the gland, its behaviour and how the function of the gland can help to keep us healthy, not only in the young, as many have thought, but into later life.

paullambden@compuserve.com