SURGICAL MANAGEMENT OF ANTERIOR MEDIASTINAL MASSES

Essay

Submitted In Partial Fulfillment for Master Degree In General Surgery

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Cairo, 2014


(نَرْفَعُ دَرَجَاتٍ مَنْ
نَشَاءُ وَفَوْقَ كُلِّ
ذِي عِلْمٍ عَلِيمٌ)
صدق الله العظيم
سورة يوسف (آية ٧٦)

Acknowledgement

Many thanks to Allah, who granted me the ability to perform this essay.

First and foremost, I feel always indebted Allah, the most kind and the most merciful, who guided and aided me to bring this work to light. I would like to express my deepest gratitude and sincerest thanks to **prof Dr. Mohammad Abd-Albasset Hasan** Associate professor of Cardiothoracic Surgery Faculty of Medicine, Al-Azhar university as he gave me privilege to work under his supervision and valuable advices.

Words are not enough to express my greatest thanks and deepest appreciations to **prof Dr. Saleh Raslan Hussein** Associate professor of Cardiothoracic Surgery Faculty of Medicine, Al-Azhar university for his comments, ideas, constrictive criticism and support throughout this work.

Although words cannot make enough appreciation to **prof Dr. Mohammad Esmat Abdel-Ghani** Associate professor of Oncologic surgery and, my dear **Dr. Mohammad Al-Dosoky Sharra** Lecture of cardiothoracic surgery Faculty of medicine Al Azhar University and for their support at home and work, Also their great help in gathering information to complete the work.

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LIST OF ABBREVIATIONS

(ADASP)	Association Directors of Anatomic and Surgical Pathology
(AFP)	Alpha Fetoprotein
(ALL)	Acute Lymphoblastic Leukemia
(APUD)	amine precursor uptake and decarboxylation
(BMT)	Bone Marrow Transplantation
(CA)	Carcinoembryonic Antigen
(CGRP)	Calcitonin gene-related peptide
(CNS)	Central Nervous System
(CT)	Computed Tomography
(ESTS)	European Society of Thoracic Surgeons
(FDG)	Fluorodeoxyglucose
(GCTs)	Germ Cell Tumors
(HCG)	Human Chorionic Gonadotropin
(HD)	Hodgkin Disease
(HU)	Hounsfield Unit

(IGCCCG) International Germ Cell Cancer of Collaborative Group

(IGF) Insulin-like Growth Factor

(IMV) Internal Mammary Vessels

(ITMIG) International Thymic Malignancy Interest Group

(IVIG) Intravenous Immunoglobulin

(JART) Japanese Association for Research on the Thymus

(KVp) peak Kilo Voltage

(L) Lumbar

(LA) Left Atrium

(LBCV) Left Brachiocephalic Vein

(LMB) Left Main Bronchus

(LSCA) Left Subclavian Artery

(LV) Left Ventricle

(MCT) Medullary Carcinoma of Thyroid

(MG) Myasthenia Gravis

(MRI) Magnetic Resonance Imaging

(NANET) Norfolk Algorithm of Neuroendocrine Tumor

(NCI) National Cancer Institute

(NETs) Neuroendocrine Tumors

(PET) Positron Emission Tomography

(PMNSGCT) Primary Mediastinal Non Seminomatous Germ Cell Tumor

(PP) Pancreatic Polypeptide

(PRCA) Pure Red Cell Aplasia

(RBCV) Right Brachiocephalic Vein

(RM) Residual Mediastinal mass

(RMB) Right Main Bronchus

(RPA) Right Pulmonary Artery

(RT) Radiotherapy

(SP) Substance P

(STM) Serum Tumor Marker

(SVC) Superior Vena Cava

(T) Thoracic

(Tc-99) Technetium 99m

(TNM) Tumor Node Metastasis

(US) Ultrasonography

(VATS) Video-assisted Thoracic Surgery

(VIP) Vasoactive Intestinal Peptide

(WHO) World Health Organization

(ZE) Zollinger Ellison

Introduction and Aim of the work

The mediastinum is located in the central portion of the thorax, between the two pleural cavities, the diaphragm and the thoracic inlet. It is usually divided into anterior, middle, and posterior "compartments" to help categorize tumors and diseases according to their site of origin and location.

The anterior mediastinum is defined as the region posterior to the sternum and anterior to the heart and brachiocephalic vessels. It contains the thymus gland, lymph nodes, internal mammary vessels, fat, connective tissue, and can potentially be occupied by structures such as ectopic parathyroid tissue or substernal goiter.

Anterior mediastinal tumors comprise approximately one half of all mediastinal masses. Masses that arise in the anterior mediastinum include neoplasms, cysts, masses due to congenital or developmental abnormalities, and inflammatory or infectious lesions. Anterior mediastinal neoplasms include thymoma (the most common tumor of the anterior mediastinum), thymic carcinoma, thymic carcinoid, thymolipoma, germ cell tumors, and parathyroid adenoma; nonneoplastic conditions include thymic cyst, lymphangioma, and intrathoracic goiter. While lymphomas occur in the anterior mediastinum, they are usually part of a pathological process that includes other compartments of the mediastinum. The most common primary anterior mediastinal tumors are thymoma, teratoma, substernal goiter, and lymphoma. All other lesions are extremely rare.

AIM OF THE WORK

The aim of the work is to review recent literature dealing with anterior mediastinal masses with emphasis on literature concentrating on recent modalities in diagnosis and management. Given the critical importance of surgery in the management of thymic epithelial tumors as opposed to lymphomas, this work will focus mainly on thymic epithelial tumors. Lymphomas, however, will be dealt with briefly without going into much detail.

Anatomy of the Mediastinum

Introduction

The mediastinum is the thoracic space bounded superiorly by the thoracic inlet, inferiorly by the diaphragm, anteriorly by the sternum, and posteriorly by the spine. Laterally it is bounded by the pleural spaces and includes the mediastinal pleura. Numerous, arbitrary divisions of the mediastinum, ranging from three compartments to seven, have been proposed for convenience in localizing pathology ***(Daniel and Thomas, 2005).***

The exact anatomic borders of these divisions are unclear, and different authors have different definitions ***(Armstrong, 1995).***

Additionally, these borders do not have clear-cut implications to the development of disease and do not form barriers to the spread of disease; however, each compartment of the mediastinum has its own most common lesions, and knowing the location of the mass, the patient's age, and the presence or absence of symptoms considerably narrows the range of possible diagnoses ***(Fraser, 1994).***

The most classic description as described in **Gray's Anatomy** divides the mediastinum into four compartments: *superior*, *anterior*, *middle*, and *posterior*. The *superior mediastinum* includes all structures from the thoracic inlet superiorly to a line drawn from the lower edge of the manubrium to the lower edge of the fourth thoracic vertebra, inferiorly. Inferior to this line is the *inferior mediastinum*, which is subsequently divided into the *anterior*, *middle*, and *posterior* compartments that are bounded inferiorly by the diaphragm. The boundary between the anterior and middle compartments is the anterior pericardium; between the middle