بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

INTRODUCTION

Haemoptysis is defined as bleeding from the lower respiratory tract. It has a wide clinical spectrum ranging from mild spotting to life-threating haemorrhage. Haemoptysis is classified as mild (< 50 mL/24 hr), moderate (50-300 mL/24 hr), and severe (>300 mL/24hr) ***(Panda et al., 2017)***.

Haemoptysis due to bleeding from bronchial arteries can take place due to various causes most important of which are Bronchiectasis, Tuberculosis, Arteriovenous malformations, Chronic Bronchitis, Malignancy, Cavitary Lung lesions, as well as fungal infection. Un-identified cause is defined as cryptogenic haemoptysis ***(Kervancioglu et al., 2015).***

Although Computed Tomography (CT) and bronchoscopy are important in identifying the cause and the site of bleeding, Angiography is essential being both diagnostic and therapeutic ***(Gupta et al., 2018).***

Since the last decade of the twentieth century; Trans-arterial Embolization (TAE) has emerged as a very important treatment modality and a gold standard in management of various kinds of bleeding all over the body for example, Cerebral, Upper and Lower GIT, Urinary and genital bleeding as well as Haemoptysis. TAE in general and BAE specifically are minimally invasive procedures that can always be done under local anaesthesia on emergency outpatient basis and is gaining wide acceptance in all guidelines being safe and effective treatment with very high technical and clinical success rates with markedly less complications compared with surgical treatment options ***(Panda et al., 2017).***

Bronchial Artery Embolization has become a corner stone treatment for significant hemoptysis, given its high early success rate and relatively low risk compared with alternative medical and surgical treatments ***(Bhalla et al., 2015).***

AIM OF THE WORK

To evaluate the technique, efficacy, and safety of Bronchial Artery Embolization in patients with hemoptysis from cavitary lung lesions.

Chapter 1

LUNG ANATOMY

The human lungs are considered a major organ of the respiratory system. They are a pair of large spongy organs to perform gas exchange of oxygen and carbon dioxide with air from the atmosphere. They are formed of parenchyma, supplying vessels, bronchial tree (trachea, bronchi, and bronchioles) within a supportive connective tissue. Covered by a serous membrane called the visceral pleura, and the surrounding cavity formed between the lungs and the surrounding chest wall and mediastinum, covered by parietal pleura, is called the pleural cavity. Each lung is consisting of the apex, Base, lobes, surfaces (three), borders (three) **(Figure 1)** ***(Digumarthy et al., 2018).***

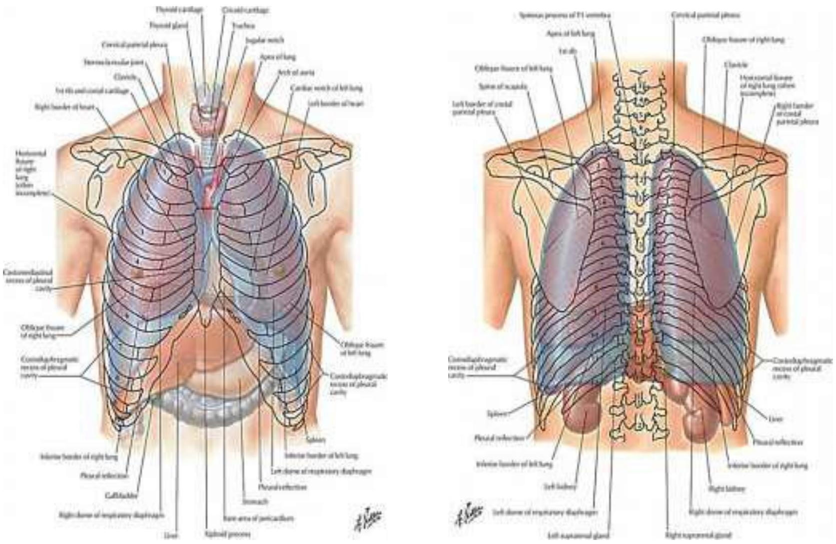

Figure (1): Surface anatomy of the thorax showing both lungs including their surfaces ***(Frank, 2018).***

Pleura:

Each lung is covered by a serous membrane called pleura arranged as a closed invaginated sac. Each pleura is divided into two parts visceral and parietal pleura, they continue with each other at the hilum of each lung. The visceral (pulmonary) pleura attaches closely to the outer surface of the lung and extends into the interlobar fissures. It continues over the hila as the parietal pleura, covering the internal surface of the thoracic cavity as mediastinal organs, most of the diaphragm and the corresponding half of the thoracic wall **(Figure 2).**

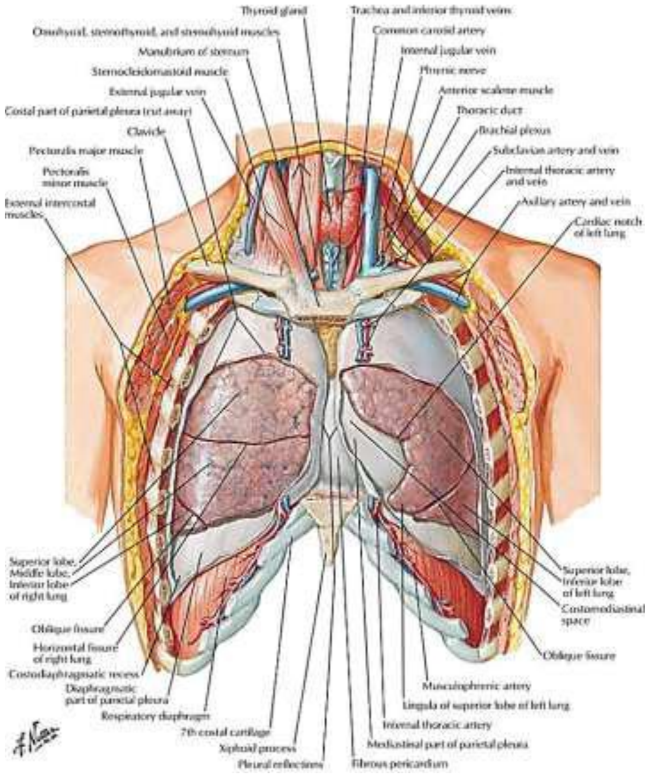

Figure (2): Lungs in Situ: Anterior View shows the covering pleura of each lung ***(Frank, 2018).***

The pleural cavity represents the potential space between the two pleurae and contains a small volume of serous fluid that has two major functions as it lubricates the surface of the pleura, allowing them to slide over each other and it produces a surface tension, pulling the parietal and visceral pleura together ***(Horia, 2016).***

Surfaces:

There are three surfaces of each lung including the costal, mediastinal, and diaphragmatic surfaces.

- The costal surface is the outer smooth and convex surface, which faces the ribs and the vertebrae.
- The mediastinal surface abuts the mediastinum. The mediastinal surface of the right lung carries the impression of the right subclavian artery, superior vena cava (SVC), and paratracheal soft tissues, including the esophagus, the azygous vein, the right atrium, and the inferior vena cava (IVC). The left lung carries the impression of the left subclavian artery, thoracic aorta, and the left atrium and ventricle.
- The diaphragmatic surface also called the base of the lung, rests on the thoracic diaphragm

(Digumarthy et al., 2018)

Hilum:

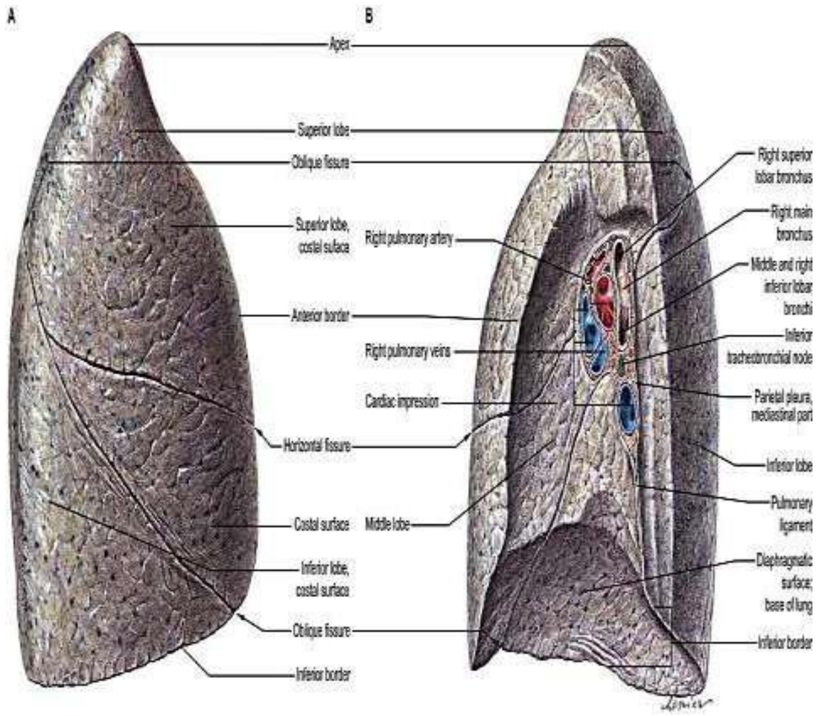

Figure (3): The right lung and its hilum. A. Lateral surface. B. Medial surface ***(Frank, 2018)*.**

The hilum of the lung (also called the root of the lung) is formed by the principal bronchi, the central pulmonary arteries and veins, the bronchial nerves and vessels, and the lymphatics, which enter and leave the lung from the mediastinum **(Figure 3 and 4)** ***(Digumarthy et al., 2018)*.**

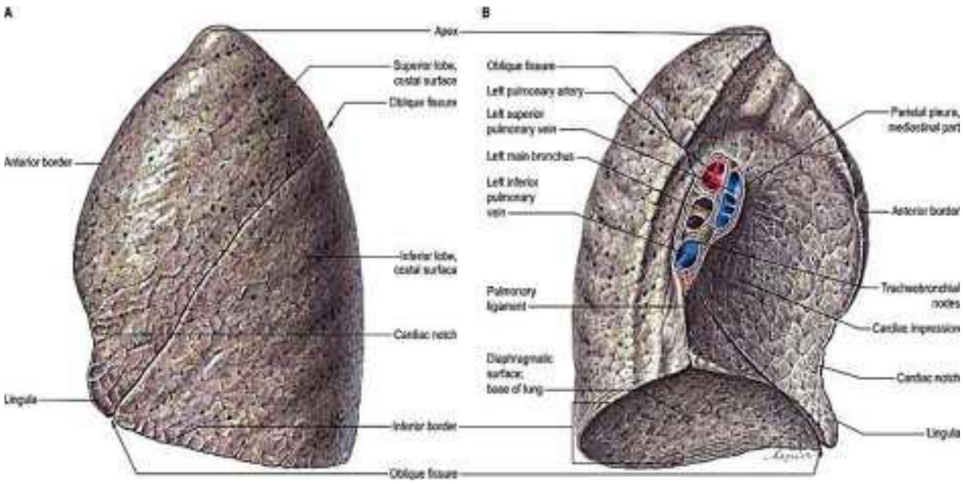

Figure (4): The left lung and its hilum. A. Lateral surface. B. Medial surface ***(Frank, 2018).***

Pulmonary Fissures and Lobes:

- **<u>Right lung:</u>**

The right lung is divided into superior, middle, and inferior lobes by its oblique (major) and horizontal (minor) fissures. The oblique fissure separates the inferior from the superior and middle lobes and corresponds closely to the left oblique fissure.

The horizontal fissure separates the superior and middle lobes. It passes from the oblique fissure, near the midaxillary line, horizontally forwards to the anterior border of the lung.

The smaller middle lobe is wedged between the superior and inferior lobes. The azygos vein may sometimes course in a more lateral position, within a four-layered pleural septum within the superior lobe, creating an, azygos lobe‟. Accessory fissures may separate either the medial basal segment (Twining"s line) or the superior segment from the remainder of the inferior lobe **(Figure 5)** ***(Susan, 2016).***

- **Left lung**

The left lung is divided into superior and inferior lobes by its oblique fissure, which extends from the costal to the medial pulmonary surfaces, superior and inferior to the hilum. Traced around the chest, the fissure reaches the fifth intercostal space (at or near the mid-axillary line) and follows this to intersect the inferior border of the lung, close or just inferior to the sixth costochondral junction (7.5 cm from the midline). The superior lobe lies anterosuperior to the oblique fissure and includes the apex, anterior border, much of the costal, and most of the medial surfaces of the lung. A small process, the lingula, is usually present at the lower end of the cardiac notch. The larger inferior lobe lies behind and below the fissure and contributes almost the whole of the base **(Figure 5)** ***(Susan, 2016).***

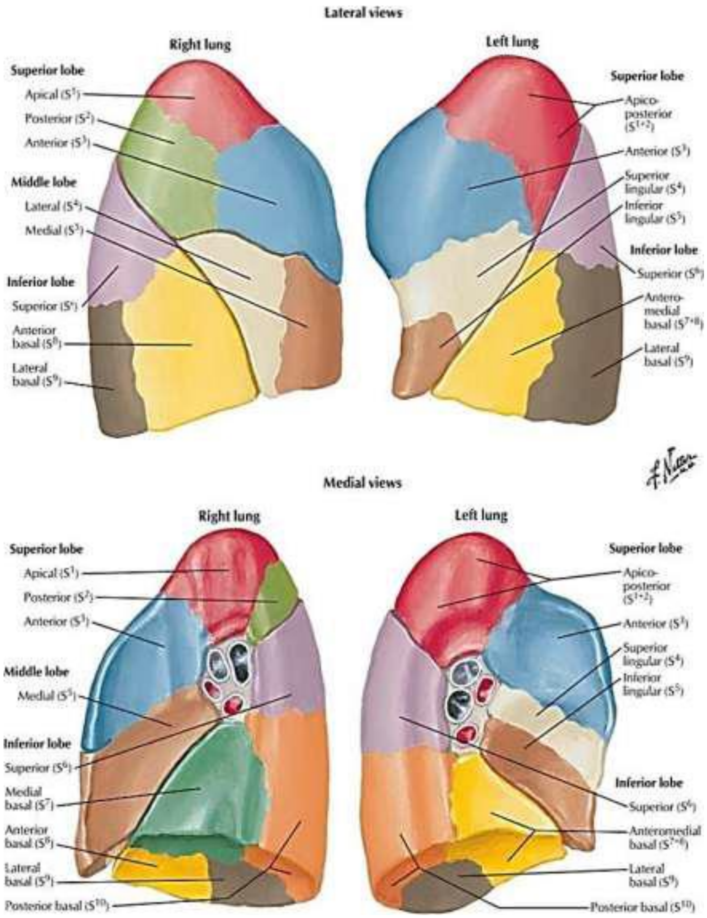

Figure (5): Bronchopulmonary Segments, lobes, and fissures of both lungs ***(Frank, 2018).***

Bronchopulmonary Segments:

The bronchopulmonary segment is a smaller division of each lobe, supplied by a tertiary bronchus and its segmental artery. The significance of such compartmentalization is that each segment is functionally and anatomically discrete, and thus can be removed surgically without affecting the neighboring segments. The veins and lymphatics run along the edges of the segments. There are typically 10 bronchopulmonary segments in the right lung (three, upper lobe; two, middle lobe; five, lower lobe) and eight segments in the left lung (four, upper lobe; four, lower lobe). One can define these segments based on the fissures and bronchovascular anatomy **(Figures 6 and 7)** ***(Digumarthy et al., 2018).***

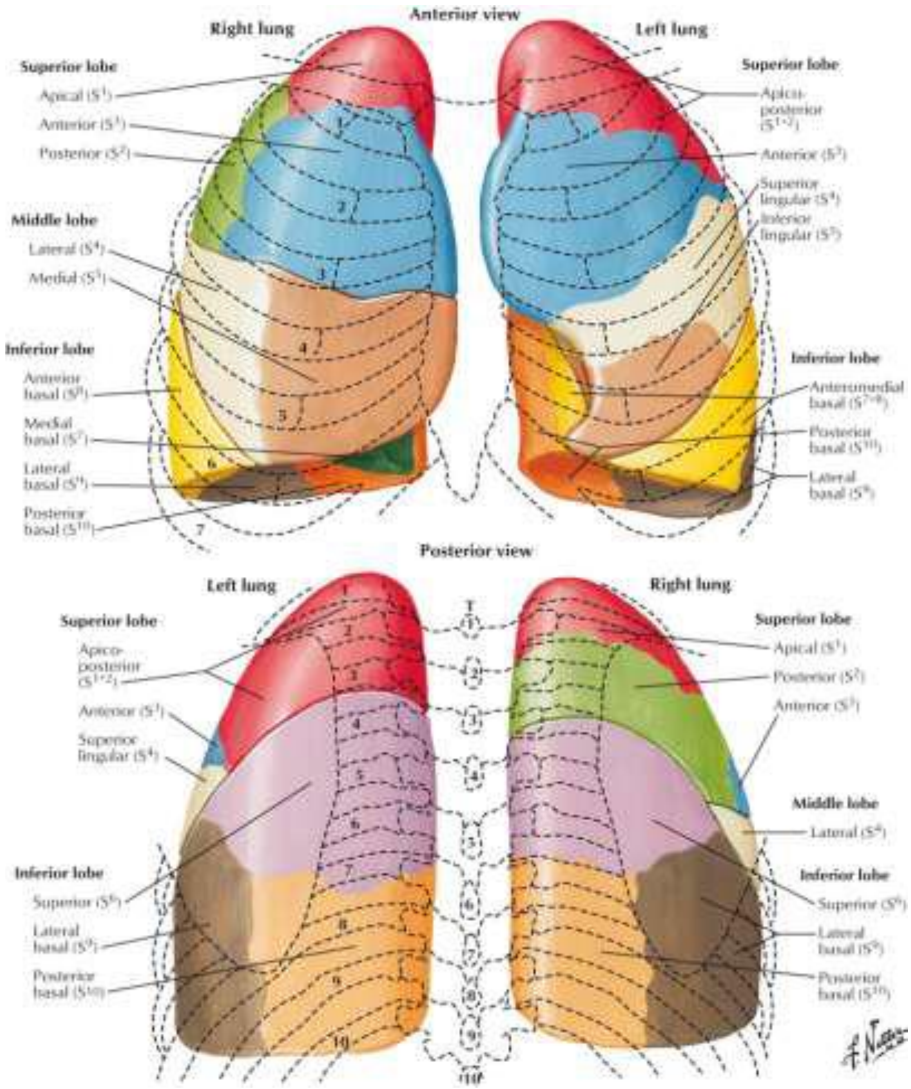

Figure (6): *Bronchopulmonary Segments of both lungs* ***(Digumarthy et al., 2018).***

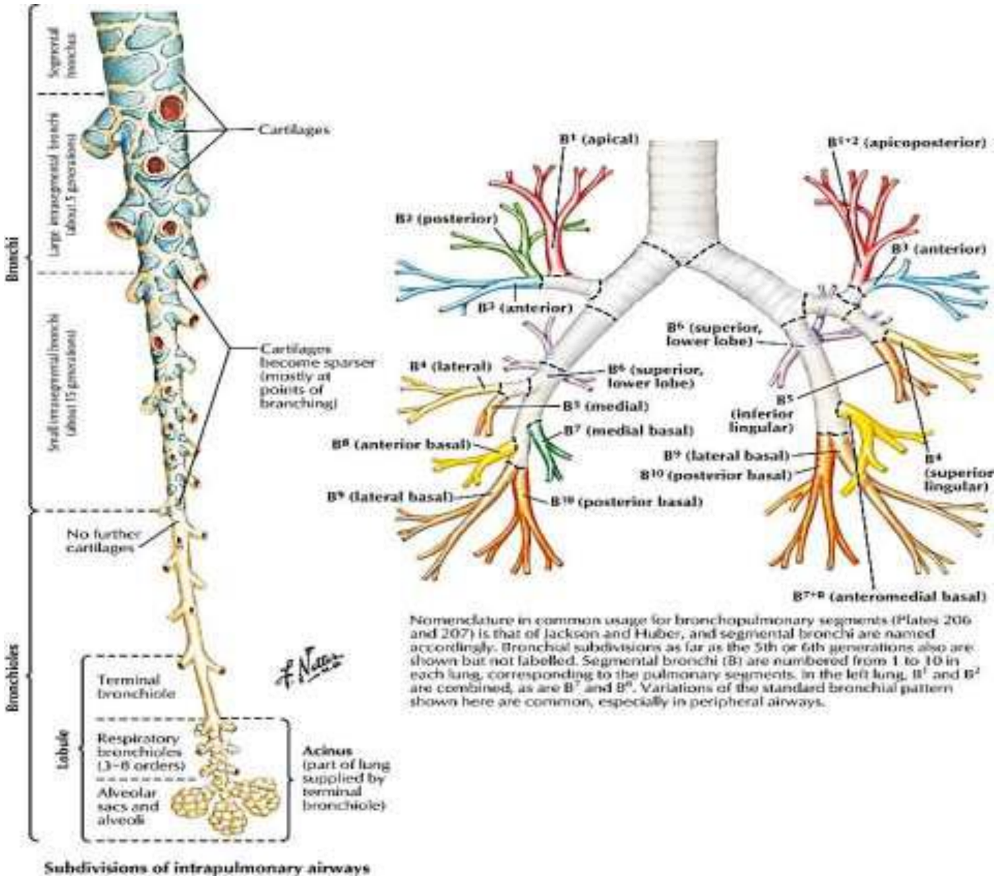

Figure (7): Nomenclature of Bronchopulmonary Segments
(Frank, 2018).

Vascular Supply:

The pulmonary trunk bifurcates into right and left pulmonary arteries that approach the hila of the lungs. Each artery divides into branches that accompany the segmental and sub segmental bronchi, mostly in a posterolateral position.