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A Study on Relative Positions of Pulmonary Artery, Pulmonary Veins And Principal Bronchus in the Hilum of Human Cadaveric Lungs

Dr T Naveen Sagar
Assistant Professor, Department Of Anatomy, Apollo Institute Of Medical Sciences And Research , Murukambattu-517127, Chittoor, Andhra Pradesh,India.
Corresponding Author: Dr T Naveen Sagar

Abstract:
Introduction: *The hilar structures of both the right and left lungs shows considerable variations. The aim of the present study is to understand the relative positions of the pulmonary artery, principal bronchus and pulmonary veins in the hilum of both right and left lungs.*
Methods: *In the present study 35 lungs dissected from cadavers of both sexes were studied for the hilar structures and there relative positions from above downwards and before backwards with in the hilum.*
Results: *The study has shown upper pulmonary vein, pulmonary artery and principal bronchus from before backwards in all the 35 lungs. In the 19 right lungs from above downwards the structures observed are as follows eparterial bronchus, pulmonary artery, principal bronchus and lower pulmonary vein. In the 16 left lungs from above downwards the structures observed are as follows pulmonary artery, principal bronchus and lower pulmonary vein. In all the 19 right lungs eparterial bronchus was accompanied in front by a branch of the pulmonary artery.*
Discussion: *The detailed knowledge of the lung hilar structures and its possible variations is crucial for the cardio thoracic surgeons.*
Key Words: *Lung Hilum, Pulmonary Artery, Pulmonary Vein, Principal Bronchus, Eparterial Bronchus.*

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I. Introduction

Segmental resection of the lungs, surgeries of lungs are commonly done by the cardio thoracic surgeons. In order to protect the normal structural and functional integrity of the lung after the surgery and to create a proper plane for segmental resection or lobectomy of the lung, it is very important to understand the normal position and relationship between the structures present in the hilum of the lung. The bronchus, pulmonary artery and the two pulmonary veins are the major structures in the hilum of both the lungs, in addition right lung hilum has eparterial bronchus.

II. Materials & Methods

The cadavers used for the study of the structures of the hilum of the lungs are obtained from the Department of Anatomy Apollo institute of medical sciences and research, Murukambattu, Chittoor district, Andhra Pradesh. The cadavers are properly embalmed and preserved. The instruments used for dissection are as follows: Toothed forceps, Blunt forceps, Pointed forceps, Scissors, needles. Standard dissection techniques were used under aseptic precautions to open the thoracic cavity and remove the lungs from the cadavers to study the hilar structures of the both right and left lungs. A high resolution 12 mage pixel digital camera was used for obtaining high quality images. A computer was used for better presentation and editing of the study.

III. Results And Discussion

RESULTS : From the cadavers of both sexes 35 lungs have been studied for the hilar structures. Among 35 lungs taken for the study 19 lungs were of right sided and 16 lungs were of left sided. All the 19 right lungs have shown the following structures from above downwards they are eparterial bronchus, pulmonary artery, principal bronchus and lower pulmonary vein and from before backwards upper pulmonary vein, pulmonary artery and principal bronchus**.** All the 16 left lungs have shown the following structures from above downwards namely pulmonary artery, principal bronchus and lower pulmonary vein and from before backwards upper pulmonary vein, pulmonary artery and principal bronchus. when we see the structures in all the lung specimens from before backwards pulmonary artery lies at a higher level when compared to other two

structures. upper pulmonary vein lies antero inferior to the pulmonary artery and principal bronchus lies postero inferior to the pulmonary artery this can be clearly observed in the Fig 1.1, 1.2, 1.3, 1.4.

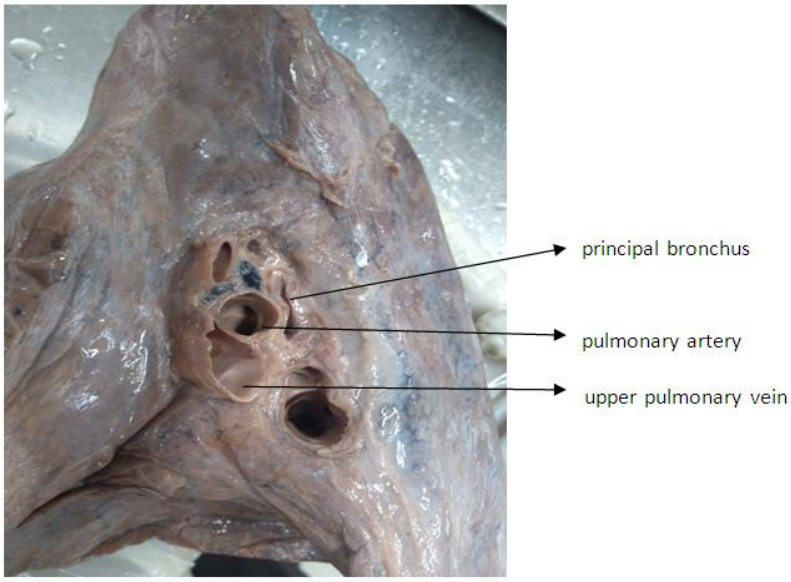

Fig 1.1 Right Lung showing upper pulmonary vein, pulmonary artery and principal bronchus from before backwards

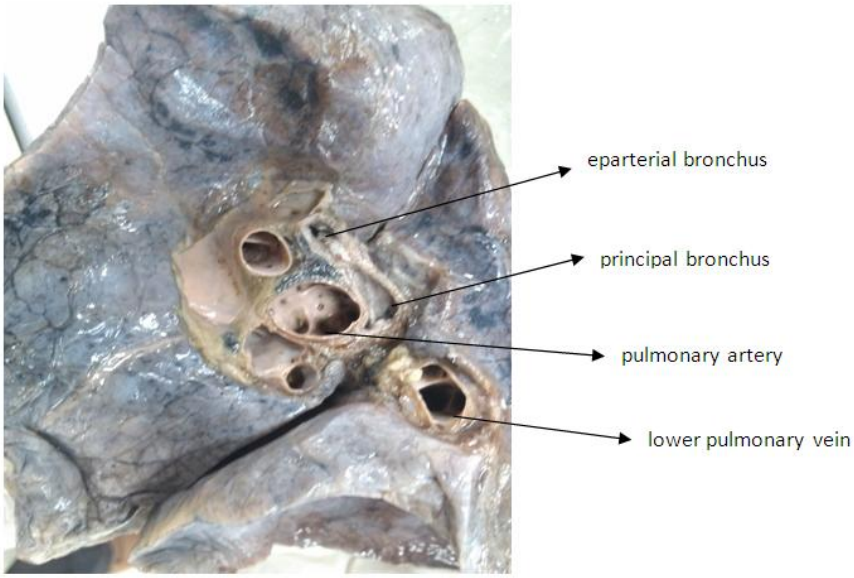

Fig 1.2 Right Lung showing eparterial bronchus, pulmonary artery , principal bronchus and lower pulmonary vein from above downwards

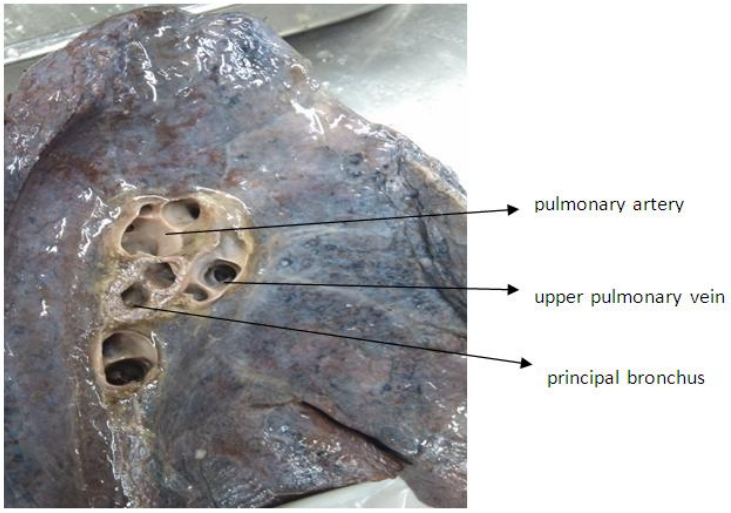

Fig 1.3 Left Lung showing upper pulmonary vein, pulmonary artery and principal bronchus from before backwards

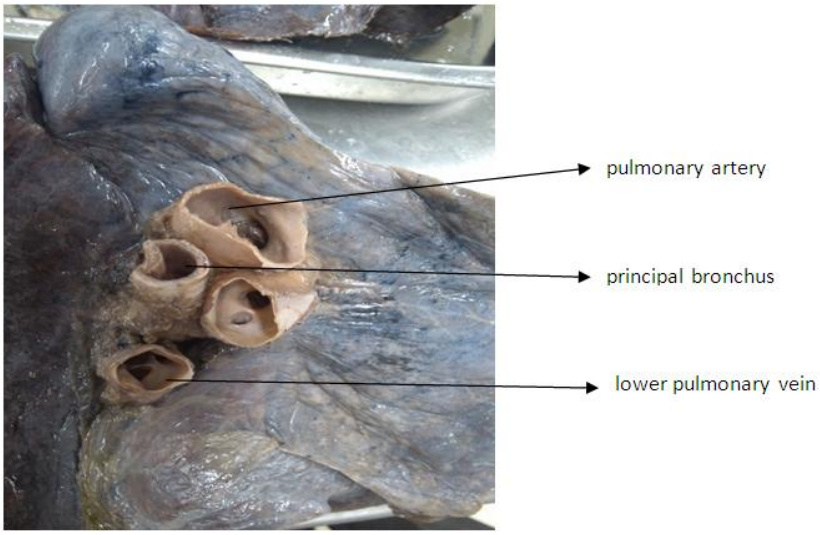

Fig 1.4 Left Lung showing pulmonary artery, principal bronchus and lower pulmonary vein from above downwards

IV. Discussion

According to Murlimanju, Massand, Madhyastha, Pai, Prabhu, Saralay the variations in the pulmonary hilar structures is extremely variable. In the present study a total number of 35 lungs (19 right lungs, 16 left lungs) from cadavers of both sexes were studied for the relative positions of pulmonary artery, principal bronchus and pulmonary veins. All the 19 right lungs and 16 left lungs showed the following structures from before backwards namely upper pulmonary vein, pulmonary artery and principal bronchus. In the 19 right lungs from above downwards the structures observed are as follows eparterial bronchus, pulmonary artery, principal bronchus and lower pulmonary vein. In the 16 left lungs from above downwards the structures observed are as follows pulmonary artery, principal bronchus and lower pulmonary vein. In all the 19 right lungs eparterial bronchus was accompanied in front by a branch of the pulmonary artery.

V. Conclusion

In all the 35 lungs lungs(19 right lungs and 16 left lungs) taken for the study the structures present in the hilum are two pulmonary veins (one upper and one lower pulmonary vein), one pulmonary artery, one principal bronchus. in addition on the right side eparterial bronchus was present above the pulmonary artery. and this eparterial bronchus was accompanied in front by a branch of the pulmonary artery. the knowledge of pulmonary hilar structures and its possible variations is very crucial for the cardio thoracic surgeons who perform lung resections, transplantation of lungs and lobectomy or segmentectomy operations of the lung.

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