

Case report

Bilobed single left lung or single lobed two left lungs?- a case report

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Abstract

The lungs are divided into lobes by the fissures. The oblique fissure divides the left lung into the upper and lower lobes. It may depict variations ranging from complete absence to variable depth. In the former case, the lung is unilobed and in the latter, the adjacent lobes are continuous with each other at the depth of the fissure. These variations may be attributed to the defective pulmonary development. In the present case, we found two separate lungs in the left thoracic cavity. One was anterosuperior and other was posteroinferior in position. There was no communication between two lungs at all. Even the roots and the hila were separate. No such variant with separate lobes and hila of two lungs could be traced in the accessible literature. Such a variant is important for surgeons performing lobectomy & segmental resection, radiologist interpreting X ray and CT scan images and also of academic interest to all medical personnel. Its ontogeny and clinical implications are discussed.

Key words: Left Lung, Lobes, Fissures, Hilum, Root.

Introduction

The lungs are pair of the essential respiratory organs in the humans. Fissures are an integral part of human lung which divide it into lobes. The oblique fissure divides the left lung into superior and inferior lobes which extends from the costal to the medial surfaces starting above and behind the hilum, ending below and in front of it. Right lung has both oblique and horizontal (transverse) fissures dividing it into superior, middle and inferior lobes. The transverse fissure passes from the oblique fissure, near the mid-axillary line, horizontally forwards towards the anterior border and then passes backwards to the hilum on the mediastinal surface.⁽¹⁾ The fissures facilitate the movement of the lobes in relation to one another, which accommodates greater distention and movement of the lower lobes during respiration. The fissures may be complete, incomplete or

absent. In case of complete fissure the lung lobes are held together only at the hilum by the bronchi and the pulmonary vessels. Parenchymal fusion of varied extent along the floor is found in case of incomplete fissure.⁽²⁾ In addition to these fissures lung might also have accessory fissures, usually indicating junction between the bronchopulmonary segments.

Knowledge of the anatomy and variations of the major fissures are essential for recognizing their variable imaging appearances as well as related abnormalities. The cardiothoracic surgeons performing segmental lung resections and the radiologists must have a detailed knowledge of variations of classical and accessory fissures regarding their length, depth, positions etc to have uncomplicated preoperative and postoperative events and proper radiological interpretations respectively.⁽³⁾

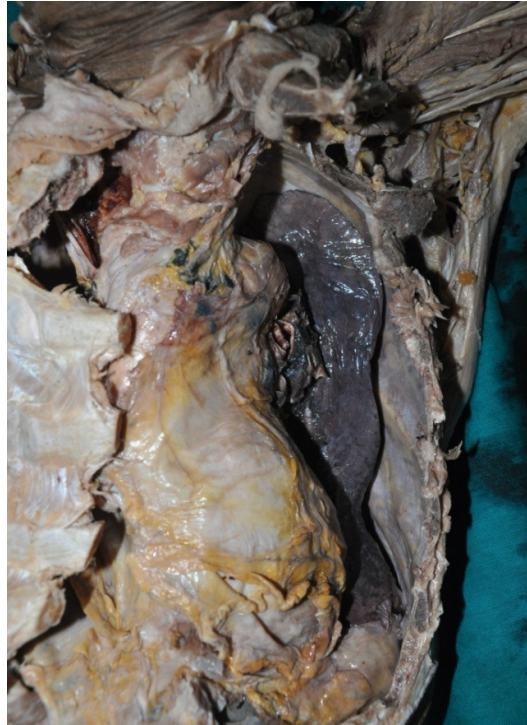


Figure 1: Posteroinferior Left Lung Lying In The Left Thoracic Cavity While Anterosuperior Lung Has Been Removed.

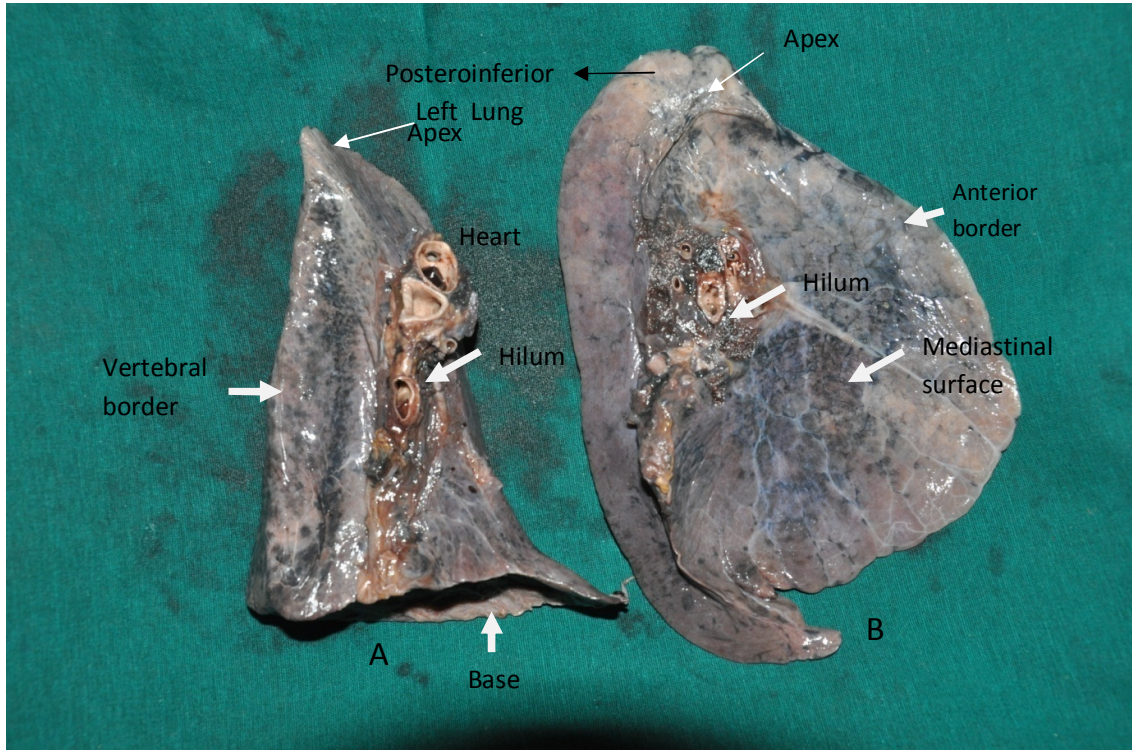


Figure 2: A: Posteroinferior lung tissue. B: Anterosuperior lung tissue

Case report

During routine dissection of thoracic region of 45 years old male cadaver for the undergraduate students at B.P.S. GMC for Women, Khanpur Kalan, Sonapat there were seen two separate lungs lying in the left thoracic cavity, one lying anterosuperior and other being posteroinferior (See figure 1) both having a separate hilum. The anterosuperior lung had an apex but no base. It had an anterior border, posteroinferior border touching the oblique fissure and an incomplete inferior border which was completed by posteroinferior lung. It had a costal surface touching the thoracic wall and a mediastinal surface but no vertebral surface. The posteroinferior lung had an apex lying below the level of the posterior end of the first rib and a base. It had an inferior border, posterior border and an anterior border touching the posteroinferior border of the anterosuperior lung. It had a costal surface, vertebral surface and only a part of the mediastinal surface (See figure 2). Arrangement (from above downwards) of structures in the hila of both the lungs were pulmonary artery, bronchus and inferior pulmonary vein. There was no fissure in both the lung tissues so they were not divided into lobes. No anomaly was detected in right lung.

Discussion

As per the standard textbooks of anatomy, the left lung is divided into two lobes by an oblique fissure. This fissure may be complete whereby the two lobes are united only at the hilum or incomplete where they are continuous with each other in some part of the fissure. Craig and Walker⁽⁴⁾ graded these fissures in four grades:-

Grade I- complete fissure with entirely separate lobes;

Grade-II- complete visceral cleft but parenchymal fusion at the base of the fissure;

Grade III- visceral cleft evident for a part of the fissure;

Grade IV- complete fusion of lobes with no evident fissural line.

Earlier many authors have found different patterns of fissures of the lung. But none of them could find such a variant where the lobes are separated even at hilum so that there are separate hila & roots for the two lobes thus giving the appearance of two lungs. The present specimen is unique in that the two lobes are having separate roots & thus give the appearance of two lungs. The anterosuperior lung is equivalent to the upper lobe and the posteroinferior lung is equivalent to the lower lobe. No report of such variant lung could be traced in the accessible literature.

Ontogeny:

The lung develops as two buds arising by bifurcation of the distal end of median tracheobronchial diverticulum which arises from the foregut. These two buds form two principal bronchi at the distal end of which the two lungs develop. The left principal bronchus divides into two lobar bronchi destined for the two lobes. In the present specimen it seems that this division of the left principal bronchus into two lobar bronchi was quite early & proximal so that the two lobes completely separated from each other with even separation of other structures of the root viz. pulmonary artery & veins. This led to the present variant of two lungs on left side.

Clinical implications:

Variations of lobar pattern and fissures of lungs have been described by many authors^(5,6,7,8,9) whereas presence of two lung tissues on one side as seen in the present case was not mentioned in the previous studies. Familiarity with the appearance and implications of incomplete fissure is important in planning operative strategy because they may contribute to post-operative air leakage. Pneumonia

in particular lobe is often limited to that lobe alone by the fissures. In patients with incomplete fissures is of major clinical concern because disease processes such as pneumonia may spread from one lobe to the adjacent lobe.⁽¹⁰⁾ In a patient with such variant, the pneumonia will not be able to spread from one lobe to the other. But radiologically it may give confusing pictures because consolidation

would be well marked separately in the two lobes (lungs). Even hilar shadows may be different.

Conclusion:

The knowledge of anatomical variations of the fissures and lobes of the lung is not only important for a cardiothoracic surgeon performing the lobectomy or surgical resection of a segment but also for a radiologist for accurate interpretation of radiological images.

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