

DISCOVERY OF A NEW LEFT LUNG LOBAR PATTERN: IMPLICATIONS FOR ANATOMY AND SURGERY

Harsha Kiran Devulapalli

Department of Anatomy, Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Chinnaoutpalli, Gannavaram Mandal, Krishna District, Andhra Pradesh, India.

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Abstract

The lungs are divided by the fissures into different lobes. The oblique fissure divides the left lung in to two lobes namely the upper and lower lobes. Defective pulmonary development gives rise to variations in lobes and fissures of lung. In the present case, we report an unreported variant lobar pattern of the left lung, in which the left lung was completely separated in to anterior and posterior lobes by a vertical fissure with separate hilums. The anterior lobe of lung was divided in to upper and lower lobes by an incomplete oblique fissure. To the best of our knowledge, such variant lobar pattern of the left lung has not been reported in literature. Anatomical knowledge of such variations is helpful for lobectomies, surgical resections involving individual segments and radiologists for interpreting X-rays, MRI, CT scans.

Keywords: Left lung, lobes, lung bud, oblique fissure, vertical fissure.

Introduction

The lungs are pair of essential respiration organs in the humans. They are separated into lobes by fissures, with three lobes on the right and two on the left. The oblique fissure of the left lung extends from the costal to the medial surface of the lung and divides it into upper and lower lobes [1].

The fissures facilitate the uniform expansion of the whole lung and may be complete whereas lobes remain intact at the hilum by bronchii and pulmonary vessels. The fissures of lung may be incomplete or absent, thus complicating identification of various pathologic conditions. Anatomical knowledge of morphological variation of fissures and lobes of lungs are essential not only for students of anatomy but also to the cardiothoracic surgeons as well as radiology faculties. The present case describes a variant lobar pattern of the left lung in the thoracic cavity, a condition which is not reported in literature.

Hence the, the awareness of variations of lobes and fissures of lung is essential, which facilitate location of bronchopulmonary segments for performing lobectomies and segmental dissection of lobes and also to academicians in the medical fields.

I. Case report

During routine dissection of thoracic region of 45 years old male cadaver for the undergraduate students at Pinnamaneni Siddhartha institute of medical sciences & research foundation, Gannavaram; Krishna Dist; A.P (INDIA), we encountered an unusual variant lobar pattern of the left lung. The left lung was completely

divided by a vertical fissure into anterior and posterior lobes with separate hilums (Fig-1&2). The anterior lobe of lung was divided into upper and lower lobes by an incomplete oblique fissure (Fig-3). No abnormality was detected in the right lung.

II. Discussion

Developmental anomalies of the lungs are important because they can cause complications during infancy, early childhood, or adulthood. These are classified into bronchopulmonary (lung bud) anomalies, vascular anomalies and combined lung and vascular anomalies [2, 3]. Development of lung starts as early as 3 weeks of embryonic life, during the development as the lungs grow the spaces or fissures that separate individual bronchopulmonary segments become obliterated except along two planes, oblique or horizontal which give rise to the fissures. Due to partial or incomplete obliteration of spaces leads to the absence or incomplete oblique or horizontal fissures [4].

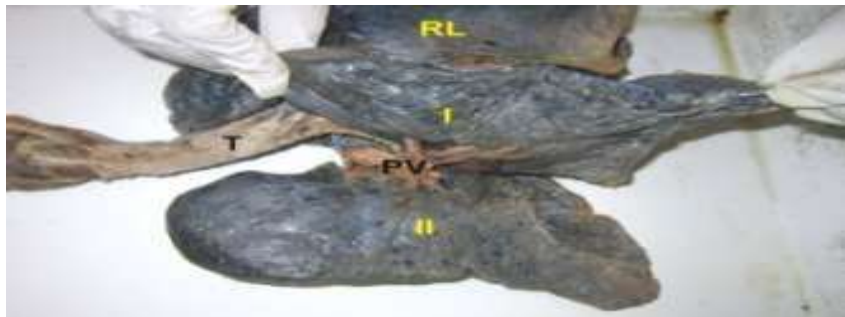
Accessory fissures of the lungs are described as clefts of various depths lined by two layers of visceral pleura. From the radiological point of view, an accessory fissure is important because it can be mistaken for lung pathologies. The accessory fissures may be mistaken as plural effusion [4], confuse a radiologist interpreting skiagrams or may act as a barrier to spread of infection. Variations of lobar pattern and fissures of lungs have been described by many authors [5, 6, 7, 8, 9], whereas vertical fissure found 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. Medlar in his examination of 1200 pairs of lungs found incomplete oblique fissure in 10.6% of the left sided lung [10] such variant oblique fissure was seen in the present case.

Hilum is a depressed area that lies near the center of the mediastinal surface where the various structures leave and enter the lung via its root. However in the current case the left lung was completely divided by a vertical fissure into anterior and posterior lobes with separate hilums, such anomaly has not been cited in the recent medical literature.

IV. Figures

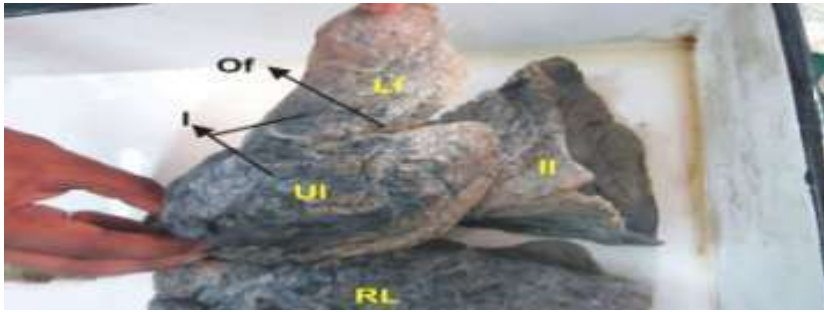
Fig- 1: Complete accessory vertical fissure dividing the left lung into anterior and posterior lobes



I- Posterior lobe of left lung; **II-** Anterior lobe of left lung; **PV-**Pulmonary Veins; **RL-** Right Lung;

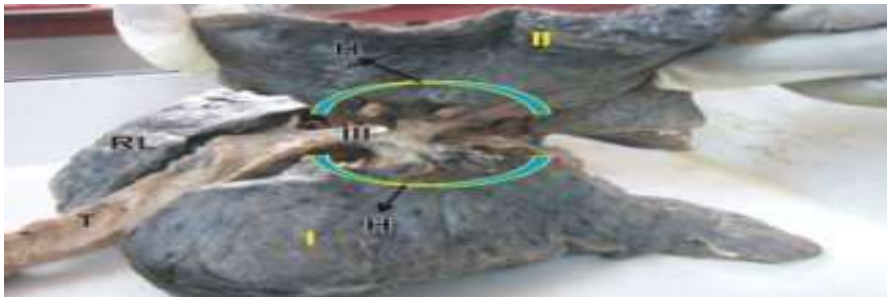
T- Trachea

Fig- 2: Showing an incomplete oblique fissure dividing the anterior lobe of left lung in to upper and lower lobes.



I- Anterior lobe of left lung; **II-** Posterior lobe of left lung; **Of-** Oblique fissure; **UL-** Upper lobe; **LI-** Lower lobe.

Fig -3: Hilum of anterior and posterior lobes left lung



I-Anterior lobe of left lung; **II-** Posterior lobe of left lung; **RL-** Right Lung; **T-** Trachea; **H-** Hilum of the anterior and posterior lobes left lung. **III-** left principal bronchus.

Conclusion

Considering the clinical importance of such anomalies, we as anatomists opine that prior awareness and anatomical knowledge of the presence of accessory lobes and fissures in the lung may be important for performing lobectomies, surgical resections involving individual segments and radiologists for accurate interpreting radiological images.

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