Case Report

Anomalous Lobar Pattern of Right Lung: A Case Report

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ABSTRACT

The right lung classically has two fissures, an oblique and a horizontal, dividing it into three lobes namely the superior, middle and lower. The anomaly of the lobar pattern has been described by many research workers on CT scans, whereas, there are fewer studies on gross anatomical specimens. In the present case, which was incidentally detected, a right lung in which there was presence of oblique fissure dividing the lung into two lobes, there was complete absence of horizontal fissure. Such a variation is clinically important for identifying broncho-pulmonary segments. Anatomical knowledge of anomalies of fissures and lobes of lungs may be important for surgeons performing lobectomies, radiologists interpreting X ray and CT scans and also of academic interest to all medical personnel.

Key Words: Anatomical variation, absent horizontal Fissure, Lobe, Lung

INTRODUCTION

Lobar anatomy and broncho-pulmonary segments can be appreciated better with knowledge of variations in fissures of the lungs. Anatomically, the right lung has two fissures, an oblique and a horizontal dividing it into three lobes namely the superior, middle and lowers [1]. The oblique fissure cuts the vertebral border of both the lungs at the level of 4^{th} or 5^{th} thoracic spine. Traced downwards on the medial surface it ends above the hilum; traced downwards on the costal surface, it will be found to continue across the diaphragmatic surface and turn upward on to the medial surface to end just below the lower end of the hilum [2]. The horizontal fissure, which is seen only in the right lung passes from the anterior margin into the oblique fissure to separate a wedge-shaped middle lobe from the upper lobe [3]. It passes at the level of midaxillary line to the anterior border of the lung at the level of sternal end of 4^{th} costal cartilage [1].

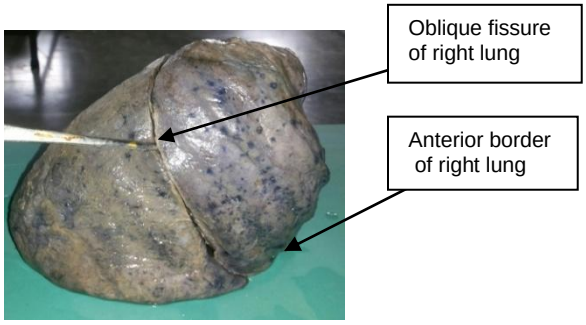
The right lung is larger and heavier than the left, but it is shorter and wider because the right dome of the diaphragm is higher and the heart and pericardium bulge more to the left [4]. The fissure can be complete or incomplete, in complete fissure lobes remain held together only at the hilum by bronchi and pulmonary vessels, it is said incomplete when there are areas of parenchymal fusion between the lobes, or they may be absent altogether.

CASE REPORT

During routine dissection of the thoracic region in the dissecting laboratory of the Department of Anatomy, Terna Medical College Nerul Navi Mumbai, we encountered an anomalous right lung which displayed variation in the pattern of fissures and lobes. The lobes and the fissures were observed and the lung was photographed.

OBSERVATION

We observed that in right lung, only oblique fissure was present which was complete dividing the lung into two lobes. The oblique fissure started on vertebral border at the level of spinous process of 5^{th} thoracic vertebra. On further tracing on medial surface it terminated 3 cm. above the hilum. When traced on costal surface it became continuous with diaphragmatic surface. The horizontal fissure was completely absent in this lung.



DISCUSSION

During development, in prenatal life, fissures separate individual broncho-pulmonary segments as the lungs grow. The spaces remain along the interlobar planes to give rise to major (oblique) and minor (horizontal) fissures in a fully developed lung [6]. Absence or incompleteness of a fissure could be due to obliteration of these fissures either completely or partially. With defective pulmonary development, there can be variations in the lobes and fissures of lung [7]. These fissures, oblique or horizontal may be incomplete or absent due to partial or complete obliteration [5].

In a study conducted on 1200 pairs of lungs [8], incomplete oblique fissure was noted in 10.6% and 25.6% of the left and right-sided lungs, respectively and incomplete horizontal fissure was noted in 17.1% of the right-sided lungs. Oblique fissures were absent in 7.3% and 4.8% of the left-sided and right-sided lungs respectively. Horizontal fissure was absent in 45.2% of the right-sided lungs.

In 1999, Lukose *et al*. [9], conducted a study on morphology of the lungs, wherein it was observed that 21% of left lungs showed incomplete oblique fissure. It was also observed that the horizontal fissure was absent and incomplete in 10.5% and 21% of left lung and right lung respectively. In 1999, Bergman *et al*. [10], studied variations in peripheral segmentation of right lung and the base of the right and left lungs ,in this study they reported that the horizontal fissure was absent in 21% and incomplete in 67% of right lung. They also reported that 30% of right lung had incomplete oblique fissure. Meenakshi *et al*. (2004) [5] reported that the horizontal fissure was absent in 16.6% and was incomplete in 63.3% of right lung while 46.6% of the left lung showed incomplete oblique fissure. From these studies, it can be concluded that absence of fissure is a common form of lung variation so; the variation of fissure should be considered when operative strategy for thoracoscopic pulmonary resection is planned where an incomplete fissure may contribute to post-operative air leakage [5].

CONCLUSION

The knowledge of anatomical variations of the lobes of the lung is important for identifying broncho-pulmonary segments; it is also beneficial for interpretation of radiological images. Anatomical knowledge of such variations is helpful for lobectomies and surgical resections involving individual segments.

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