



Original Research Article

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VARIATION OF FISSURE AND LOBAR PATTERN OF LUNG: A CASE REPORT

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ABSTRACT: The anatomical knowledge of the fissures and the lobes of the lung are important for accurate interpretation on CT scans. The right lung classically has two fissures, an oblique and a horizontal, dividing it into three lobes namely the superior, middle and lower. The absence of horizontal fissure and 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 during routine dissection in department of Anatomy, Mekelle university CHS, we encountered an anomalous right lung, we report one fissure dividing the female cadaver right lung into two lobes and presence of incomplete oblique fissure and absence of horizontal fissure in male cadaver right lung. The knowledge of anatomical variations of lung fissures is essential for clinicians, surgeons, and for radiologist and for academic interest to all medical personnel to recognize various images of related abnormalities because an accessory or anomalous fissure can be mistaken for a lung lesion or an atypical appearance of pleural effusion.

KEYWORDS: Anatomical Variations, Anomaly, Horizontal fissure, Lobe, Right Lung

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1.INTRODUCTION

The fissures are conducive to uniform expansion of lobes. They provide routes for movements of lobes in relation to each other. The appearance of accessory lung fissure varies on X- ray and CT scan. This is seen especially in reference to depth or completeness of the fissure. A fissure appearing complete on X-ray might be seen as an incomplete one on CT scan and vice versa may also be seen [1]. An incomplete major fissure may lead to disease spread, collateral air drift, or the “incomplete fissure sign,” a sign that may, however, also be present in cases of complete fissure. The knowledge of anatomical variations of lobes and fissures of the lung is important for identifying precise location, extent and morphology of bronchopulmonary segments. As the fissures form the boundaries for the lobes of lungs, the Knowledge of the anatomy and normal variant of the major fissures is essential for recognizing their variable imaging appearances as well as related abnormalities [2].Pre-operative planning and strategy for pulmonary lobectomy and segmental resection may also change during presence of such Anomalous of Lobar Pattern and absence or presence of accessory fissures.

CASE REPORT

During routine dissection of thoracic region of 45 year old female and 60 year old male cadaver in the Department of Anatomy, Mekelle university CHS, we encountered an anomalous right lung of both cadaver , which displayed variation in the number of fissures lobes. There was no history of pulmonary disease in the individual. The specimen was photographed (Fig.1and Fig.2).



A. Costal surface

B. Mediastinal Surface

Fig.1. Photograph of dissected female cadaver right lung specimen Showing one fissure (OF: Oblique fissure) and two lobe (superior and inferior)



A. Costal surface



B. Mediastinal Surface

Fig.2. Photograph of dissected male cadaver right lung specimen Showing one fissure (OF: Oblique fissure) and two lobe (superior and inferior)

2.OBSERVATIONS

The female cadaver right lung displayed complete oblique fissure and absence of horizontal fissure was noted and within the male cadaver its right lung shows incomplete oblique fissure and absence of horizontal fissure, as a consequence anomalous of the fissure we observed two lobes in the right lung. No anomalous was detected in the left lung.

3.DISCUSSION

The fissures are the spaces which separate individual broncopulmonary buds or segments and they get obliterated except along the two planes which later manifests as horizontal or oblique fissure [3]. Lung fissures helps in a uniform expansion of the whole lung and they also form the boundaries for the lobes of the lungs. Two fissures oblique and horizontal, divides right lung into three lobes namely, upper, middle and lower. The oblique fissure separates the lower lobe from the remaining two lobes. The horizontal fissure separates the upper and middle lobe. It begins from the oblique fissure, runs horizontally and cuts the anterior border at inner end of fourth costal cartilage. Various researchers have noted and reported the anomalous anatomy of the lungs in human cadavers [6, 7, 8, 9, 10]. The knowledge of anatomy of fissures of lung may help clarifying initially confusing radiographic findings like extension of fluid into an incomplete major fissure or spread of various diseases through different pathways [5]. Similarly to the present case, in a study done by Berkmen et al. [4] where he investigated CT sections of 40 patients, the frequency of incomplete horizontal fissure of the right-

sided lungs was high (72%), while absence of the horizontal fissure accounted for 20% of the total right-sided lungs. In line with this case another study reported by Meenakshi et al. [3], from among the 30 right-sided lungs, 16.6% showed absence of the horizontal fissure, while 63.3% had incomplete horizontal fissure. Incomplete fissure may lead to the spread of disease and collateral air drift (Hayashi *et al.*, 2001)⁴. It may alter the usual patterns of collapse seen in patients with endobronchial lesions and may also give rise to atypical type of pleural effusion [3]. Familiarity with the appearance and implications of incomplete fissure is important for planning of lobar resection because there is a higher prevalence of air leak in lobar fusion [3]. Generally speaking knowledge of fissures is necessary for the appreciation of lobar anatomy and thus for locating the bronchopulmonary segments and to differentiate it from other normal anatomical and pathological structures.

4.CONCLUSION

In conclusion, knowledge of the fissures and lobes of the lungs are important to plan various surgical procedures to avoid post-operative complications like air leakage. It can also help to explain various radiological appearances of lobar anatomy of the lungs and the position of the interlobar fluid. The results of the present study and their comparison with the previous studies shows that a variety of variations can occur at, fissures and lobes of the lungs in humans. Variations in the number and pattern of lobe structures in both human lungs have not been studied in detail by earlier researchers, thus this study adds a database for the same. Prior knowledge of fissure is helpful for clinicians in order to interpret various radiographic appearances of interlobar fluid. It is important for clinicians considering the clinical importance of such anomalies, we as anatomists opine that prior awareness and anatomical knowledge of the absence of fissures and anomalies of lobes in the lung may be important for clinicians and radiologists.

CONFLICT OF INTEREST

The authors declare that no competing financial interests exist.

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