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The Little Tongue of Left Lung

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ABSTRACT

The term lingula, meaning "little tongue," refers to the tongue-like projection at the lower part of the upper lobe of the left lung, analogous to the middle lobe of the right lung. During a routine dissection of the thoracic region, an abnormally long lingula was observed in a left lung. This observation prompted a study of the length and breadth of the lingula and its clinical significance in 30 cadaveric left lungs. Measurements were taken using an inch tape, yielding a mean lingular length of 3.67 cm and a mean breadth of 3.94 cm, with a length-to-breadth ratio of 1.2:1. The standard deviations for length and breadth were 0.65 cm and 0.84 cm, respectively. Since variations in lingular dimensions are associated with conditions like lingular pneumonia and bronchiectasis, the findings of this study can aid in preoperative planning for lobectomy.

Keywords: Lingula, lung, brocho, pneumonia, variation, bronchiectasis.

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INTRODUCTION

The term *lingula*, meaning "little tongue" in Latin, refers to the tongue-like projection of the upper lobe of the left lung. It acts as an extension of the superior lobe and is analogous to the middle lobe of the right lung. The lungs are divided into lobes by oblique and horizontal fissures. The right lung is divided into superior, middle, and inferior lobes by both an oblique and a horizontal fissure, while the left lung is divided into superior and inferior lobes by a single oblique fissure [1].

Aims And Objectives

To investigate the variations and dimensions of the lingula in cadaveric left lungs

MATERIALS AND METHODS

Type of study

Descriptive study

Study materials

30 left lungs

Instrument used to measure

Inch Tape

Study Procedure

During a routine dissection of a 70-year-old male cadaver's thoracic region, an abnormally long lingula of the left lung was observed. Based on this case report, a further study was conducted, selecting 30 left lung specimens [Figure 1] to investigate variations in the grooves and fissures related to lingula and measured its length and breadth.

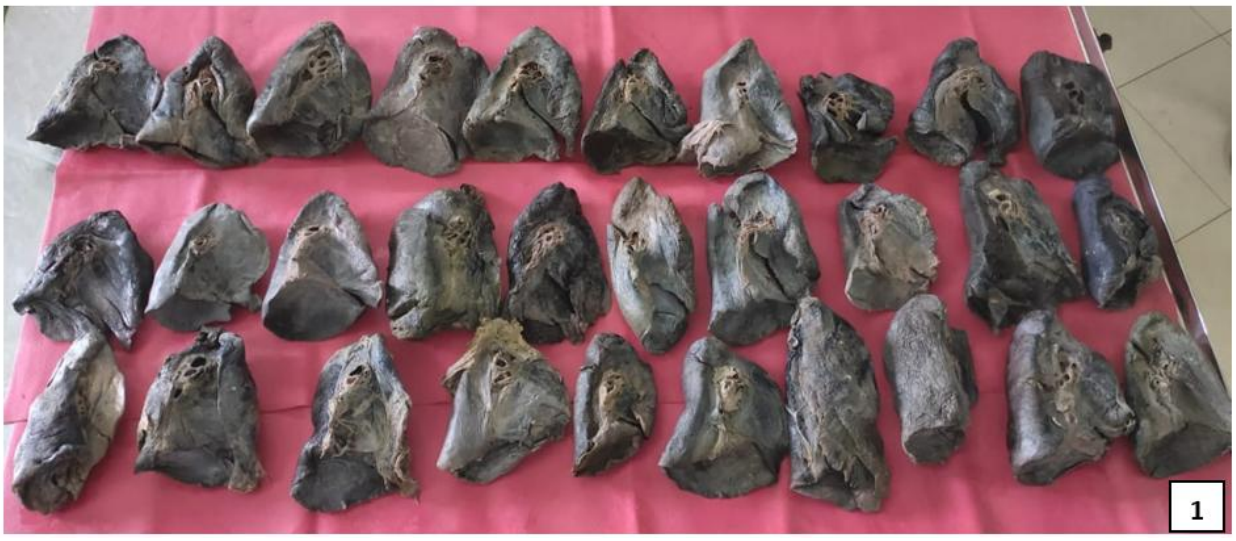

Figure 1: Cadaveric left lung specimens

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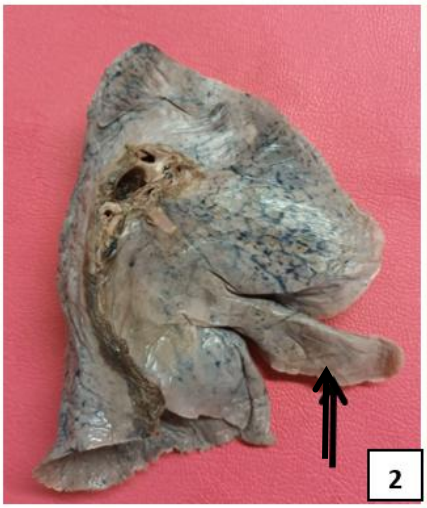


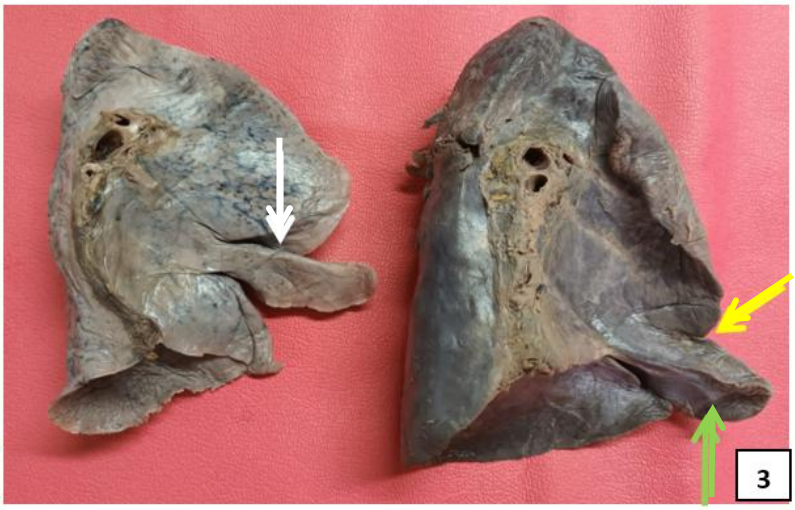
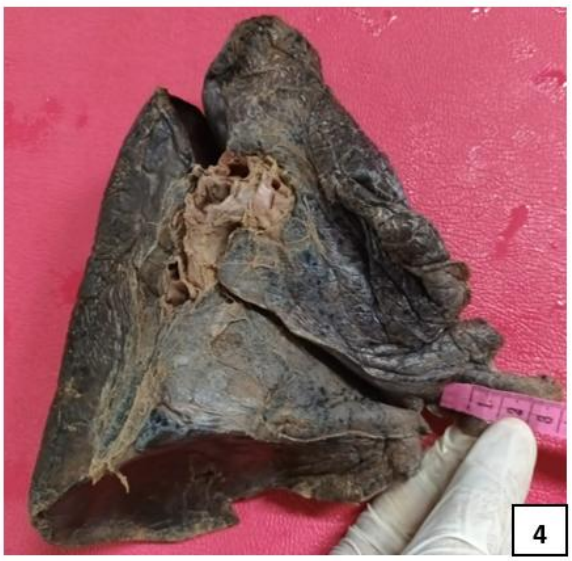


Figure 2: Black arrow - the lingula of left lung

Figure 3: White arrow - the deep fissure with long lingula,Yellow arrow - the short groove and green arrow show the wider lingula



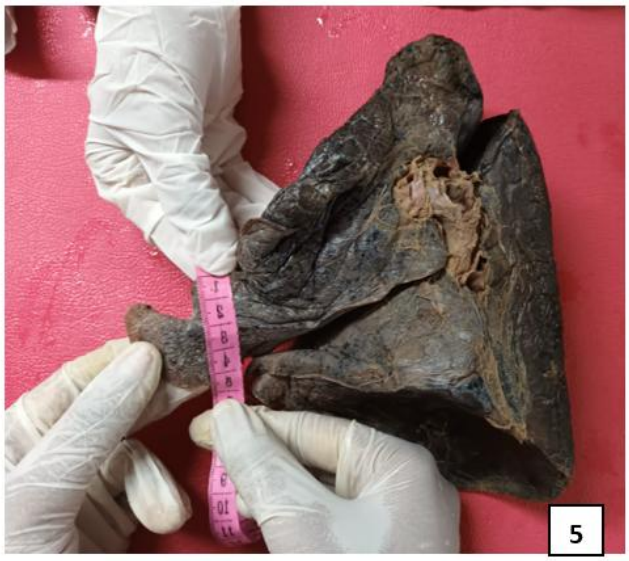


Figure 4:Mesurement of length of lingula

Figure 5:Measurement of breadth of lingula

Statistical analysis

The morphology (Grooves and fissures) of lingula was analysed with percentage,length and breadth were by Mean and standard deviation.

RESULTS

The morphology of the lingula in the left lungs was carefully observed and differentiated among 30 left lung specimens. Out of these, 10 specimens (33%) exhibited a deep, groove-like accessory fissure that extended from the middle of the cardiac notch above the lingula, connecting with the root of the left lung. This structure appeared as a separate lobe [Figures 2, 3]. Additionally, five specimens (16%) displayed a short,

shallow groove [Figure 3]. The length and breadth of the lingula were measured in all specimens [Figure 4,5] and analyzed using mean and standard deviation [Table] with a length-to-breadth ratio of 1.2:1.

Table: The dimensions of lingula of left lung

Measurement	Mean ± Standard Deviation(cm)
Length of lingula	3.67 ± 0.65
Breadth of lingula	3.94 ± 0.84

DISCUSSION

Lingula is located at the anterior side of the left lung and appears distinctly elongated due to presence of deep fissures, above and below it.

Variations in lung morphology are commonly associated with various pathologies. The study observed incomplete horizontal and oblique fissures in the right lungs and incomplete oblique fissures in the left lungs. The horizontal fissure was absent in 15% of right lungs, while the oblique fissure was absent in 4% of left lungs. Accessory fissures, predominantly incomplete, were found in 17% of right lungs and 6% of left lungs, except for a single left lung with a complete accessory fissure separating an accessory lobe [2].

The lobes of the lungs can exhibit partial fusion due to incomplete pulmonary fissures. The study observed incomplete oblique fissures in the left lung, with accessory fissures ranging from small notches to prominent fissures that often-separated accessory lobes. A notable example is the left minor fissure, frequently observed as an accessory fissure that separates the lingula from the upper lobe. In the right lung, superior and inferior accessory fissures were more common compared to the left lung. The wide variability in the occurrence of oblique, horizontal, and accessory fissures may result from genetic and environmental factors influencing lung development. Since fissures delineate the boundaries of lung lobes, understanding their positions is crucial for identifying lobar anatomy and accurately locating bronchopulmonary segments, which holds significant anatomical and clinical importance [3].

The authors reported a unique case of an incomplete fissure in the left lung accompanied by the absence of the cardiac notch and lingula. Raising awareness about variations in lung fissures and lobes, along with their clinical implications, is crucial for medical students to enhance their understanding and clinical practice [4].

Diseases such as pneumonia and carcinoma can rapidly spread throughout the lung when the parenchyma is uninterrupted by fissures. A rare variation observed was the absence of the oblique fissure in the left lung, resulting in the fusion of the superior and inferior lobes. Additionally, the cardiac notch and lingula were also absent [5].

Dutta et al.,3 have done a study on fissures of both lungs, in which they observed that oblique fissure was not present in the left lung in 8% cases and right lung in 11.54% cases from 102 formalin-fixed cadaveric lung specimens [6].

In 2022 the authors observed the variations in lobes of cadaveric lungs were observed in the lobar and fissure architecture [7].

In 2024, Krishnasamy S et al. reported a unique finding of the lingula of the left lung being connected to the diaphragm by a ligament. This cord-like structure displayed ligamentous characteristics and was distinct from the well-known inferior pulmonary ligament. This discovery underscores the importance of detailed anatomical knowledge and has the potential to enhance surgical techniques and improve patient outcomes [8].

The authors hypothesized that morphological variations in the lungs might influence the development and recurrence of spontaneous pneumothorax. The variations in the number and pattern of lobes in human lungs remain poorly understood, and there is limited knowledge about the potential association between such variations and lung diseases like spontaneous pneumothorax [9].

The lingula is a notable site for biopsy due to its ease of location and the higher prevalence of fibrosis and vascular diseases in this region. The authors concluded that the lingula is comparable to other anatomical sites in terms of its diagnostic utility [10].

The present study reports that a deep, groove-like accessory fissure was observed in 33% of the specimens, while 16% of the specimens exhibited a short, shallow groove. The mean length of the lingula was 3.67 ± 0.65 cm, and the mean breadth was 3.94 ± 0.84 cm.

During the fourth week of intrauterine life, the lung bud develops from the respiratory diverticulum. Initially, the respiratory diverticulum is continuous with the foregut. A longitudinal ridge, known as the tracheoesophageal septum, separates the trachea from the esophagus. The diverticulum then bifurcates into two buds, which develop into the left and right primary bronchi. These primary bronchi proliferate further, giving rise to secondary and tertiary bronchi.

As development progresses, most of the spaces or fissures are obliterated. However, the spaces that remain within the lobes of the lung form the horizontal and oblique fissures in the mature lung. During the fetal period, the bronchopulmonary segments are initially separated by spaces, which later become obliterated, except along the lines of division of the principal bronchi, leading to the formation of the oblique and horizontal fissures in the fully developed lung. Along these fissures, the visceral pleura reflect and cover the individual lobes on all sides.

Defective pulmonary development can result in variations in the fissures and lobes of the lungs. Incomplete or absent oblique and horizontal fissures may result from defects in the process of fissure obliteration, either partial or complete [11,12].

CONCLUSION

Understanding variations in lingular dimensions is essential for the diagnosis and treatment of various lung pathologies. Variations in lingular dimensions can influence the surgical margins during lobectomy or segmentectomy procedures. Therefore, cardiothoracic surgeons must carefully consider these differences during surgical planning.

Additionally, these findings highlight the importance of accounting for morphological variations in the lingula during radiological assessments. Radiologists should be aware of these differences to ensure accurate interpretation of imaging studies.

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