Topographical anatomy of anomalous oblique fissure and lingula of the lung

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Abstract

The oblique fissure of the left lung is known to reach its inferior border. The tongue shaped process below the cardiac notch of the left lung is known as the "lingula". In the present study, we report a case in which the oblique fissure did not reach the inferior border, rather extended into the anterior border of the left lung, thereby lodging the lingula much above its usual position. Thus, the lingula was not at the extreme lower end of the anterior border but it was above the termination of the oblique fissure, on the anterior border of the left lung. To the best of our knowledge, an anomalous position of the lingula has not been reported in literature. Topographical anatomy of cardiac notch, lingula and the oblique fissures may be important for radiologists interpreting skiagrams and surgeons operating on the lungs.

Keywords: lung, fissure, lingula, variation, cardiac notch, anatomy.

1 Introduction

The oblique fissure of the left lung extends from the costal to the medial surface of the lung and divides it into a superior and an inferior lobe (STANDRING, 2005). It is reported in standard anatomical textbooks that the oblique fissure reaches the lower border of the left lung almost near its anterior end (MOORE and DALLEY, 2006; STANDRING, 2005). The oblique fissure reaches the level of 5th intercostal space in the midaxillary line and intersects the inferior border close to or just below the 6th costochondral junction (STANDRING, 2005). The superior lobe of the left lung is considered to lay anterosuperior to the oblique fissure. In the present case, we observed the oblique fissure to take a course towards the anterior border of the left lung. As result, the left lung had a cardiac notch and lingula much above its normal position.

Spaces or fissures separating the individual bronchopulmonary segments are present in each lung and in due course of time, these spaces obliterate except along the two planes i.e. horizontal and oblique giving rise to the fissures (MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004). Absence or incomplete fissure may be formed due to incomplete or partial obliteration of spaces (MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004). In the 5th week, the lung buds mature (SADDLER, 2004). Due to the growth of the lung buds, the spaces present between them might have resulted in an altered direction of the oblique fissure, as seen in the present case.

Anomalies pertaining to the lingula are rare. Anatomical knowledge of the anomalies of oblique fissure, cardiac notch and lingula may be beneficial for surgeons operating on the lungs and the radiologists interpreting skiagrams in day to day clinical practice.

2 Case report

During routine dissection in the department of anatomy, we observed an anomalous left lung in a 45 year-old cadaver. Morphometric measurements were taken. The lung was studied in detail and the specimen was photographed (Figure 1). We also compared it to the lingula of a normal left lung (Figure 2).

2.1 Observations

The left lung exhibited an anomalous oblique fissure. The oblique fissure descended across the costal surface of the left lung, reaching the anterior border instead of the usual inferior border of the left lung. The oblique fissure ended 2 cm above the inferior border at its anterior end. As a result, the lingula was found much above the lower part of the anterior border of the left lung (i.e. 2 cm above the lower end of anterior border). The inferior border was located as usual at the level of the 6th rib in the midclavicular line.

The bronchopulmonary segments were normal and no other associated anomalies were observed.

3 Discussion

The lungs are divided by the fissures into different lobes. The oblique fissure begins at the medial surface of the posterosuperior part of the hilum and ascends obliquely to reach the posterior border of the lungs at a point 6 cm below the apex (STANDRING, 2005). On the costal surface, they reach the inferior border of the left lung (STANDRING, 2005). In its course, the oblique fissure is related to the 5th intercostal space at or near the midaxillary line and descends to meet the inferior border close to or just below sixth costochondral junction (STANDRING, 2005). In the present case, we observed the oblique fissure to descend and meet the anterior border 2 cm above the inferior border, which was a rare finding. This resulted in a cardiac notch and lingula being higher in position. Thus, the classical description of the inferior lobe comprising of the whole of base,

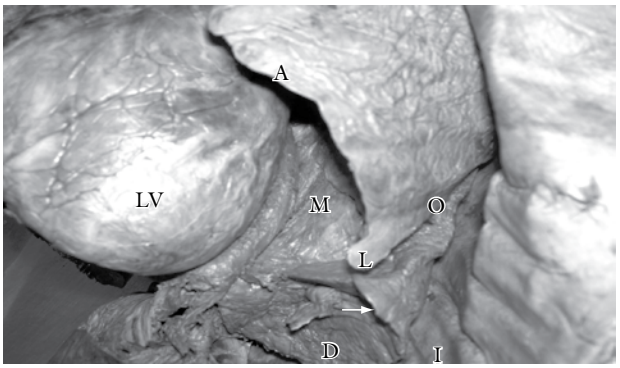

Figure 1. Photograph of anomalous left lung showing: A: Anterior border, M: Medial surface, O: Oblique fissure, LV: Left ventricle, L: Anomalous lingula located much above, D: Diaphragmatic surface, I: Inferior border. Arrow shows the lower aspect of anterior border, below lingula.

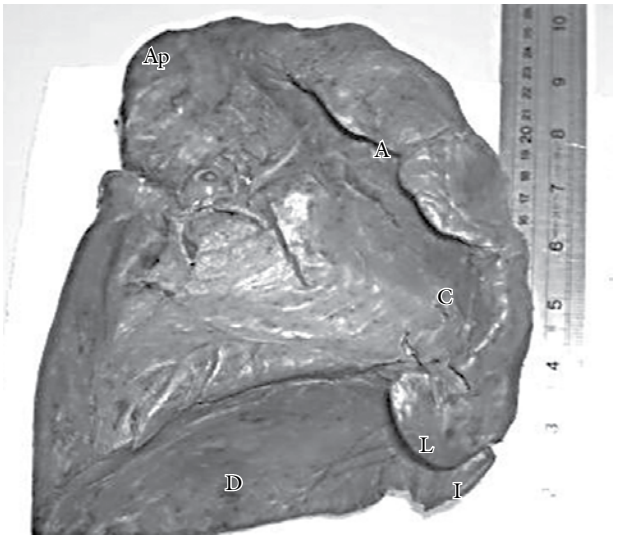

Figure 2. Medial view of the left lung showing: Ap: Apex, A: Anterior border, C: Cardiac notch, L: Lingula, I: Inferior border, D: Diaphragmatic surface.

greater portion of the costal surface and the posterior border of the lung was found to have an additional lower aspect of the anterior border, which is uncommon. The superior lobe comprised of apex, anterior border, costal and the medial surface of the lung. To summarise, we had observed the anterior border to be a part of both the superior and inferior lobes of the left lung, which is a peculiar finding.

There is paucity of information on the anomalous lingula and cardiac notch of the left lung. Majority of the studies have focused on the accessory fissures and lobes of the lungs (ALDUR, DENK, CELIK et al., 1997; AZIZ, ASHIZAWA, NAGAOKI et al., 2004; GESASE, 2006; MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004; YILDIZ, GÖLPINAR, CALIKOĞLU et al., 2004). The fissures which separate the bronchopulmonary segments become obliterated except along the planes which in developed lung presents as an oblique or horizontal fissure (MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004). It has been thought that the accessory fissures are the result of the spaces which have failed to obliterate (MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004). In the present case, we did not observe an accessory or incomplete fissure on either sides which itself suggests that there might have been an abnormal development of the lung shifting the growth of the oblique fissure towards the anterior border.

The lower border of the lung has an excursion of about 5-8 cm, in the extremes of respiration (ELLIS, 2002) and any anomaly in its lower border may have clinical significance. It is an accepted fact that the lymphatics of the lung drain centripetally from the pleura towards the hilum (ELLIS, 2002). In the present case, an altered course of oblique fissure would mean an altered course of visceral pleura, thereby changing the arrangement of the lymphatic drainage.

The location of the fissures in the lung results in uniform expansion and they are usually used as landmarks in specifying lesions (YAMASHITA, 1978). An atypical fissure may confuse a radiologist interpreting skiagrams. Often, an anomalous fissure may be mistaken as pleural effusion (MEENAKSHI, MANJUNATH and BALASUBRAMANYAM, 2004). Lingula is often taken as a landmark and its anomalous position may result in erroneous interpretation of skiagrams. Awareness of the variations of the lungs is important for surgeons performing lung resections.

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