

## Variations in Lung Fissures and Lobes: a Case Report

Arya Hedjazi, M.D.<sup>1</sup>, Maryam Sajjadian, M.Sc.<sup>2</sup>, Shabnam Mohammadi, Ph.D.<sup>3</sup>

1- Legal Medicine Research Center, Legal Medicine Organization, Tehran, Iran

2- Mashhad Legal Medicine Research Center, Legal Medicine Organization, Mashhad, Iran

3- Neurogenic Inflammation Research Center, Mashhad University of Medical Sciences, Mashhad, Iran (Corresponding author; E-mail: mohammadish@mums.ac.ir)

Received: 24 April, 2019

Accepted: 12 October, 2019

### ARTICLE INFO

#### Article type:

Case Report

#### Keywords:

Variation

Lung

Human

### Abstract

The Knowledge of variations in the lung can help surgeons to control bleeding during pulmonary lobectomy or might be used to reduce post-operative complications. Due to the importance of the knowledge of variations in lungs for clinicians, especially surgeons and radiologists, we report a case with lung lobe and fissure.

During the autopsy of a 27-year-old man at the Legal Medicine Organization of Mashhad/ Iran in 2016, lung variations were observed. He was a resident of Mashhad and had died of head trauma. On examining the lungs, three fissures (two complete fissures and one incomplete accessory fissure) and four lobes were observed in the right lung. The left lung had two superior and inferior lobes and two fissures (a complete oblique fissure and an incomplete accessory fissure).

Conclusion: The knowledge of anatomical variations in the lungs is important for clinicians because otherwise, it might lead to wrong interpretation of X-ray images and CT scans. For example, accessory fissure(s) may alter the pattern of lung collapse and lead to an erroneous diagnosis. Accessory fissure can also be confused with linear atelectasis and pleural scars.

**Copyright:** 2019 The Author(s); Published by Kerman University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Citation:** Hedjazi A, Sajjadian M, Mohammadi SH. Variations in Lung Fissures and Lobes: a Case Report. *Journal of Kerman University of Medical Sciences*, 2019; 26 (5): 398-400.

### Introduction

The two lungs are respiration organs that are located around the mediastinum (1). The right lung has three lobes and two transverse and oblique fissures. The oblique fissure continues from the lower border to upwards and backwards of the lung. The horizontal fissure continues horizontally and after passing the costal surface achieves an oblique fissure in the mid-axillary line. The left lung has two superior and inferior lobes. There is no transverse fissure in the left lung (1). Variations in the lung

have been reported in different races (2–5). Lung anatomical variations are important because these may lead to wrong interpretations among radiologists. Accessory fissure(s) may alter the pattern of lung collapse and lead to an erroneous diagnosis (6). Pneumonia is naturally limited to lobes, but in patients with incomplete fissure, it penetrates the lung parenchyma via adjacent lobes (5). Accessory fissure can also be confused with linear atelectasis and pleural scars (7). The Knowledge of variations in the lung can help the surgeon to

control bleeding during pulmonary lobectomy or may use to reduce post-operative complications, such as air leakage. Taking into consideration the importance of the knowledge of variations in lungs for clinicians, especially surgeons and radiologists, we report a case with lung lobe and fissure.

### Case presentation

During the autopsy of a 27-year-old man at the Legal Medicine Organization of Mashhad/ Iran in 2016, lung

variations were observed. He was a male 167 cm tall and his weight was 65 kg. He was a resident of Mashhad and had died of head trauma.

On examining the lungs, the right lung had three fissures (two complete fissures and an incomplete accessory fissure) and four lobes. The left lung had two superior and inferior lobes and two fissures (a complete oblique fissure and an incomplete accessory fissure).



**Figure 1.** The lungs of the reported case

The arrow head shows a complete accessory fissure. Right lung had three fissures and four lobes. The arrow shows an incomplete accessory fissure. Left lung had two fissures and two lobes.

### Discussion

In this paper, a case with accessory lobe and fissure of lung was reported. According to a study on 1,513 foetus autopsies in the UK, 35 cases (2.3%) had major fissure variations of the lung and the greatest variation was a lack of horizontal fissure in the right lung (2). Studies with the help of high-resolution CT scans have been performed, showing accessory fissure of the lung in

31% of Turkish patients (3, 4). In a study conducted on 138 cadavers in India, horizontal fissure was not found in 3.07% and it was incomplete in 35.38% of cadavers, while 4.1% of the right lung had three fissures and four lobes. About 2.7% of the left lungs had two fissures and three lobes (5). Among 210 autopsies in Turkey, incomplete horizontal fissures were found in 18 lungs and incomplete oblique fissures were observed in 6 lungs. In another study, an additional lobe has been reported in seven lungs (8). According to another study, about 11.1% of 43 lungs in Ethiopia had variations in the horizontal fissure and 51.1% had variations in the oblique fissure. Accessory lobes and fissures were observed in five lungs (9). In our study, an

incomplete accessory fissure in the left lung and a complete accessory fissure in the right lung were observed. During the eighth week of the fetal period, lung buds form bronchopulmonary segments (10–12). Accessory fissures form due to the lack of fusion spaces between segments of bronchopulmonary lungs during the embryonic development (6).

## References

1. Snell RS. Clinical Anatomy by Regions. 9<sup>th</sup> ed. Philadelphia: LWW; 2011. p. 54-55.
2. Bates AW. Variation in major pulmonary fissures: incidence in fetal postmortem examinations and a review of significant extrapulmonary structural abnormalities in sixty cases. *Pediatr Dev Pathol* 1998; 1(4):289-94.
3. Yildiz A, Gölpinar F, Calikoğlu M, Duce MN, Ozer C, Apaydin FD. HrCt evaluation of the accessory fissures of the lung. *Eur J Radiol* 2004; 49(3):245-9.
4. Ariyurek MO, Gulsun M, Demirkazik F. Accessory fissures of the lung: evaluation by high-resolution computed tomography. *European Radiology* 2001; 11(12):2449-53.
5. George BM, Nayak SB, Marpalli S. Morphological variations of the lungs: a study conducted on Indian cadavers. *Anat Cell Biol* 2014; 47(4):253-8.
6. Meenakshi S, Manjunath KY, Balasubramanyam V. Morphological variations of the lung fissures and lobes. *Indian J Chest Dis Allied Sci* 2004; 46(3):179-82.
7. Nene AR, Gajendra KS, Sarma MV. Lung lobes and fissures: a morphological study. *Anatomy* 2011; 5(1):30-8.
8. Unver Dogan N, Uysal II, Demirci S, Dogan KH, Kolcu G. Major anatomic variations of pulmonary fissures and lobes on postmortem examination. *Acta Clin Croat* 2015; 54(2):201-7.
9. Gebregziabher A, Berhe T, Ekanem P. Variations of fissures and lobes of the lungs in human cadavers in selected universities of Ethiopia. *International Journal of Pharma Sciences and Research* 2015; 6(5):981-90.
10. Mohammadi S, Nikravesht MR, Jalali M, Moeen AA, Karimfar MH. Maternal nicotine induces collagen type IV changes in the mice lung parenchyma and its vessels. *Tanaffos* 2011; 10(2):32-7.
11. Jalali M, Nikravesht MR, Moeen AA, Mohammadi S, Karimfar MH. Effects of maternal nicotine exposure on expression of collagen type IV and its roles on pulmonary bronchogenesis and alveolarization in newborn mice. *Iran J Allergy Asthma Immunol* 2010; 9(3):169-173.
12. Nikravesht MR, Moeen AA, Jalali M, Mohammadi S, Karimfar MH. Maternal nicotine induces collagen type IV changes and its role on pulmonary bronchogenesis and alveolarization in mouse newborns. *Pharmaceutical Sciences* 2010; 16(3):181-6. [In Persian].

## Conclusion

The knowledge of anatomical variations in the lungs is important for clinicians because otherwise, it might lead to wrong interpretation of X-ray images and CT scans. For example, accessory fissure(s) may alter the pattern of lung collapse and lead to an erroneous diagnosis. Accessory fissure can also be confused with linear atelectasis and pleural scars.