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Morphological Variations of Lobes of Lungs In Indian Population

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Abstract

Introduction: The lungs are pair of vital organs of respiration located within the thoracic cavity, on either side of heart. The fissures may be complete or incomplete, thus dividing the lungs into complete and incomplete lobes.

Objectives: The purpose of this study was to define the morphological variations of lobes of lungs in Indian population.

Material & Methods: Morphological variations of lobes of 80 lungs (40 right and 40 left) were studied.

Results: Out of 40 right lungs, additional lobe on costal surface was present in 1 lung (2.5%), additional lobe on inferior surface in 2 lungs (5%), one additional lobe on medial surface was reported in 1 lung (2.5%) and absence of one lobe was reported in 1 lung (2.5%). Out of 40 left lungs, the prominent lingula was noted in 2 lungs (5%) ,lobe formed at lingula because of prominent fissure was present in 1 lung (2.5%) and additional lobe was reported on costal surface in 1 lung (2.5%)

Conclusion: These variations are of radiological and surgical importance for assessment of lung disease.

Keywords: Lungs, Variations, Lobes Additional

Introduction

The lungs are vital organs of respiration and are situated within the thoracic cavity on either side of the mediastinum.Each lung is approximately half conical in shape & presents an apex, base, three borders & two surfaces. Some symmetry exists between the right and the left lungs. Both lungs are divided into lobes. The gross functional subunits of each lung are called segments and have a close relation with the segmental bronchi. The right lung comprises 10 segments: 3in the right upper lobe (apical, anterior and medial), 2 in the right middle lobe (medial and lateral), and 5 in the right lower lobe (superior, medial, anterior, lateral, and posterior). The left lung comprises 10 segments: 5 in the left upper lobe (apical, posterior, anterior, superior lingula, and inferior lingula) and 5 in the left lower lobe (superior, medial basal, lateral basal, anterior basal and posterior basal. [1,2]

Knowledge of variations of lobes is of interest to all medical professionals to exactly interpret radiographs, computed tomography scans, to diagnose, plan and modify a surgical procedure depending on the merit of the case and also in certain classical clinical cases pertaining to lung pathologies. [3]

Objectives

The purpose of this study was to define the morphological variations of lobes of lungs in Indian population.

Material and Methods

Present study was conducted in Anatomy Department of Dr D Y Patil Medical College, Navi Mumbai . A total of 80 lungs from dissection room were examined and studied. All 80 lungs were from cadavers dissected in the dissection hall of department of anatomy of Dr D Y Patil Medical College.Out of 80 lungs studied, 40 were right and 40 were of left side. Details of morphological variations of lobes were studied. Data was entered and analysed by using Microsoft excel.

Results

Out of 40 right lungs, additional lobe on costal surface was present in 1 lung (2.5%), additional lobe on inferior surface in 2 lungs (5%),one additional lobe on medial surface was reported in 1 lung (2.5%) and absence of one lobe was reported in one lung (2.5%) Table 1: Incidence of variations of lobes in right lungs

Variations	Right lungs (n-40)
Additional lobe on costal	1 (2.5%)
surface	
Additional lobe on inferior	2 (5%)
surface	
Additional lobe on medial	1 (2.5 %)
surface	
Absence of one lobe	1 (2.5 %)



Figure 1: Additional lobe on costal surface in right lung



Figure 2: Additional lobe on inferior surface in right lungs



Figure 3: Additional lobe on medial surface in right lung



Figure 4: Absence of one lobe on right lung

Out of 40 left lungs, the prominent lingula was noted in two lungs (5%), lobe formed because of prominent fissure demarcating lingula as a lobe was present in 1 lung (2.5%) and additional lobe was reported on costal surface in 1 lung (2.5%)

Table 2 : Incidence of variations of lo	bes in left lungs
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Variations	Left lungs (n-40)
Prominent fissure demarcating	1 (2.5%)
lingula as a lobe	
Additional lobe on costal surface	1 (2.5%)



Figure 5: lobe formed because of prominent fissure demarcating lingula on left lung



Figure 6: Additional lobe on costal surface on left lung



Figure 7: Prominent Lingula on left lung

Discussion

During development of the lungs numerous bronchopulmonary buds are formed and later they fuse completely except at the sites of fissure formation. This results in the formation of lobes and fissures. [4]. If there is any factor affecting the fusion in the developmental stage, there will be variations in the formation of lobes and fissures of the lung [5].

Study of George B. M etal reported absence of lobe in 2 right lungs (3.07%) whereas present study showed absence of one lobe and they showed extra lobes in 3 right lungs (4.61%) while present study indicating 4 lungs shows additional lobes.Study of George reported two lungs (2.73%) showed three lobes and 2 lungs (2.73%) had leaf like external appearance out of 73 left lungs which is similar to the present study [6]

Dhanalakshmi V et al studied morphological Study of lobes of lungs in 100 lung specimens, accessory lobes were found in 2 right lungs while in present study we reported 3 lungs with additional lobe [7].

According to the study of Devi BM et al, out of 22 right lungs, absence of one lobe was found in 2 lungs and one additional lobe was found in 1 lung(4.5%) and out of 22 left lung, one lobe was found on medial surface of 1 specimen (4.5%).[8]

Sudikshya KC found additional lobe inferiorly in 23 right lungs which is similar to the present study and 1 right lung with the "lobe of the azygos vein" .We have

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not reported azyous lobe in our study. According to their study they inspected 27 left lungs; in two specimens the lingula appeared to be separate lobe which is coinciding with present study.[3]

During cadaveric dissection of fifty cadavers, Emily Poe E reported the 3 most unique cases which are an azygous lobe, a five-lobed right lung, and a markedly enlarged lingula of a left lung. We have not reported azygous lobe in our study but found enlarged lingula in 2 left lungs.[9]

Table 3

Right lungs	Additional lobes	Absence of
		lobe
Present study	4 (10 %)	1 (2.5%)
George BM	3 (4.61%)	2 (3.07%)
Dhanalaxmi V	2 (4%)	-
Devi BM	2 (9%)	1(4.5%)
Sudikshya KC	4 (17.39%)	3(13.04%)
Poe E	1 (4.5%)	1 (4.5)

Table no 4

Left lungs	Additional lobes	Prominent lingula
Present study	2(5 %)	2 (5%)
George BM	3 (4.61%)	2 (3.07%)
Devi NB	1(4.5%)	-
Sudikshya KC	2(7.40)	-

Conclusion

Knowledge of variations in fissures and lobes is of interest to all medical professionals to exactly interpret radiographs, computed tomography scans, to diagnose, plan and modify a surgical procedure depending on the merit of the case and also in certain classical clinical cases pertaining to lung pathologies.

References

- Standring S. Gray's Anatomy. 39th ed. Churchill Livingstone, New York 2005: 945-949.
- SM Jacob, Pillay M. Variations in the Inter-lobar Fissures of Lungs Obtained from Cadavers of South Indian Origin. Int J Morphol 2013; 31(2):497-9
- Sudikshya KC , Pragya Shrestha , Aashish Kumar Shah , Arvind Kumar Jha; Morphological variations of the lungs: a study conducted on Indian cadavers.Anat Cell Biol 2014;47:253-258
- Meenakshi S, Manjunath KY, Balasubramanyam V. Morphological variations of the lung fissures and lobes. Indian J Chest Dis Allied Sci 2004;46:179-82.
- Larsen WJ. Human embryology. New York: Churchill Livingstone; 1993. p.111-30.
- George BM, Satheesha B. Nayak, Sapna Marpalli; Morphological variations of the lungs: a study conducted on Indian cadavers. International Journal of Innovative Research in Medical Science 2017;2(6):811-814
- Dhanalakshmi V , Manoharan C , Rajesh R , Suba Ananthi k ; Morphological study of fissures and lobes of lungs; Int j Anat Res 2016, 4(1):1892-95.
- Devi NB, Rao BN, Sunitha V; Morphological variations of lung - A cadaveric study in north coastal Andhra Pradesh. Int J Biol Med Res 2011, 2: 1149-1152.
- Poe E, Granite G. Anatomical lung variations: A study conducted on cadaveric specimens. Int J Anat Var. Mar 2019;12(2): 17-20.