



## MORPHOLOGICAL ANATOMY OF ACCESSORY FISSURES IN LUNGS AND ITS SURGICAL IMPORTANCE

### Anatomy

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### ABSTRACT

**BACKGROUND:** The lungs are paired essential organs of respiration located within the thoracic cavity. The Knowledge of the position and grade of accessory fissures is essential for appreciation of lobar anatomy.

**OBJECTIVE:** To study the morphological anatomy of accessory fissures in human cadaveric lungs and its surgical importance.

**MATERIAL AND METHODS:** The study was conducted on 30 pair of human cadaveric lung specimens (30 left and 30 right) of unknown age and sex of Rajasthan population from the collection of Department of anatomy of Mahatma Gandhi Medical College & Hospital Jaipur.

**RESULT:** Out of 30 pair of lungs, superior accessory fissure on left lung found 6.66% and inferior accessory fissure observed on left side 3.33% and right side 6.66%. transvers accessory fissure was observed only on left side in 13.33% cases.

**CONCLUSION:** Awareness about accessory fissures is essential for differential diagnosis, segmental resection and performing lobectomies.

### KEYWORDS

### INTRODUCTION

A pair of lungs (right and left) present in the thoracic cavity for Respiration. The right lung is broader & heavier and the left lung is longer and lighter

**Accessory fissure of lung:-** anatomically accessory fissure is a cleft of varying depth which is lined by visceral pleura. These accessory fissures usually occur at the boundaries of broncho-pulmonary segment. There are three type of accessory fissures commonly found superior accessory fissure (SAF), inferior accessory fissure (IAF) and left minor fissure (LMF). The SAF is commonly seen in the territory of lower lobe, when SAF is present the superior segment of lower lobe forms basal segment which is further known as posterior or dorsal lobe. IMF is seen around the medial basal segment of lower lobe. It extends from the region near pulmonary ligament then it arches forwards to join major fissures on the diaphragmatic surface of lung. The LMF separates the lingula from the rest of the left upper lobe. These fissures vary in length and depth from a complete fissure. Radiologically an accessory fissure appears as a thin white line, resembling major and minor fissure except for its location<sup>33</sup>.

The knowledge of the fissures and lobes of the lungs are important to plan various surgical procedure to avoid post operative complication like air leakage<sup>19</sup>.

The knowledge of frequency of variations in the pattern of the lobes and fissures of the lungs in order to avoid and reduce the mortality and morbidity associated with invasive procedures<sup>28</sup>. Radiological diagnosis of diseases like lobar pneumonia and tumors should be based on the knowledge of variations of fissures of lungs which is significant both anatomically and clinically.

### MATERIAL AND METHODS

The study was conducted on 30 pair of human cadaveric lung specimens (30 left and 30 right) of unknown age and sex of Rajasthan population from the collection of Department of anatomy of Mahatma Gandhi Medical College & Hospital, Jaipur (Rajasthan).

The specimens were obtained from the cadavers during routine dissection of undergraduate MBBS students.

All the specimens used for the study were preserved in 10% formalin solution.

### PROCEDURE

Dissection was carried out using dissecting instruments as per standard procedure as given below:

The body should be in supine position makes a median vertical incision from the jugular (suprasternal) notch to the xiphoid process and a horizontal incision along the clavical to the acromion process.

A curved incision from the xiphoid process along the costal margin to the lateral side of the body and an oblique incision from the xiphoid process upward around the areola of the mammary and gland along the medial margin of the arm.

Reflect the two skin flaps and remove the superficial fascia and fat.

Muscles of the anterior wall of the thorax, the pectoralis major and pectoralis minor, subclavius, serratus anterior and deltoid were identified and reflected.

Thoracic cavity was opened by reflecting the external and internal inter costal muscles and ribs.

The pleural cavity was identified and parietal Pleura was reflected.

The hand Inserted into the pleural cavity and pull the lung laterally and identified the structures in the root of lung and remove both the lung from the pleural cavity along pulmonary ligament.

Each specimen was thoroughly washed with the water.

Preserved in 10% formalin solution

The lungs which had gross pathological changes were excluded from the present study.

### RESULTS

Out of 30 pair of lungs, superior accessory fissure on left lung found 6.66% and inferior accessory fissure observed on left side 3.33% and right side 6.66%. transvers accessory fissure was observed only on left side in 13.33% cases. (Table 1 & 2)

**Table 1: Right lung**

Fissures	Status	Number of specimen	%
Accessory Fissure	Superior Accessory Fissure	0	-
	Inferior Accessory Fissure	2	6.66

**Table 2: Left lung**

Fissures	Status	Number of specimen	%
Accessory Fissure	Superior Accessory fissure	2	6.66
	Inferior Accessory fissure	1	3.33
	Left minor fissure	4	13.33

**DISCUSSION****Table: 5 comparison of SAF,IAF,LMF of right and left lung with other authors**

Authors	Year	Population	Accessory fissure					
			SAF		IAF		LMF	
			Rt	Lt	Rt	Lt	Rt	Lt
Magadam et al.	2015	Karnataka	2.5%	*7.5%	5%	.0%	-	.0%
Gopalakrishna et al.	2018	Kerala	6%	2%	6%	2%	-	.0%
Mukhia et al.	2013	Mumbai	4%	.0%	8%	10%	-	12%
Sudikshya et al.	2018	Nepal	4.34%	.0%	*21.73%	3.70%	-	*29.62%
Gayathri et al.	2016	Hyderabad	.0%	4%	.0%	.0%	-	.0%
Quadros et al.	2013	Karnataka	*8.33%	.0%	5.55%	5%	-	17.5%
Nene R. et al.	2011	Andhra Pradesh	4%	.0%	14%	*24%	-	26%
Biswas et al.	2018	Silchar	4.35%	2.17%	.0%	2.17%	-	17.39%
Present study	2019	Rajasthan	.0%	6.66%	6.66%	3.33%	-	13.33%

\*- highest finding, - lowest finding

SAF on right side was absent in our present study ,concorded by Gayathri et al. (2016) but highest 8.33% reported by Quadros et al.(2013).

Mukhia et al. (2013), Sudikshya et al.(2018), Quadros et al.(2013), Nene R. et al.(2011) reported absent SAF on left side but Magadam et al. (2015) observed highest 7.5% in comparison close conformity with second highest 6.66% of present study.

IAF on right side was absent in Gayathri et al.(2016) ,Biswas et al.(2018) but highest 21.73% reported by Sudikshya et al.(2018) in comparison 6.66% observed in present study and similar finding 6% reported by Gopalakrishna et al. (2018).

IAF on left side observed 3.33% in present study closeness with sudikshya et al.(2018) 3.70% and Nene et al. (2011) reported highest 24% in contrast 0% observed by Megadam et al.(2015), Gayathri et al.(2016).

LMF/ transvers accessory fissure was observed only on left side in 13.33% cases in our present study which was in conformity with Mukhia et al.(2013) 12% this was reported highest 29.62% by sudikshya et al.(2018) in contrast to 0% reported by magadam et al.(2015), Gopala krishna et al.(2018) and Gayathri et al.(2016).

**CONCLUSION**

The results of the present study and their comparison with the previous works show that there is a wide range of difference in occurrence of major, minor and accessory fissures between and among different populations. This implies that a variety of genetic and environmental factors might affect the development of these fissures. Knowledge of such variations might explain bizarre presentation of certain clinical cases pertaining to lung pathologies.<sup>36</sup> Also knowing the frequency of occurrence of a variant fissure in a particular population might help the radiologist and clinician to make correct diagnosis. Similarly, it might help the surgeon to plan, execute and modify a surgical procedure depending on the merit of the case.<sup>30</sup>

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