ABSENCE OF HORIZONTAL FISSURE IN RIGHT LUNG - A CASE REPORT

Dr. P. Anuradha¹, Dr. Arunkumar S. Bilodi²* and Dr. Hemant Kumar³

Dr. M. R. Gangadhar⁴

¹Department of Anatomy, Medicity Institute of Medical Sciences (MIMS), Ghanpur, Medchal Mandal, Ranga Reddy District, India.
²Professor and Head, Department of Anatomy, Velammal Medical College Hospital and Research Institute, Madurai-625009, India.
³Assistant Professor, Department of Respiratory Medicine, Velammal Medical College Hospital and Research Institute, Madurai-625009, India.
⁴Professor of anthropology, Manasagangothri, University of Mysore, Mysore, India.

ABSTRACT

The objective of present study is to report a case of absence of horizontal fissure in the right lung during routine dissection in the department of anatomy at Medicity Institute of Medical Sciences. A cadaver showed absence of horizontal fissure in right lung. Oblique fissure separates absence of horizontal fissure in right lung. Oblique fissure separates superior and middle lobe from inferior lobe. Fissure extends up to inferior border having the length of 28 cm. Left lung oblique fissure measures 26.7 cm. Since this is a rare observation of lung, it was studied and reported.

KEYWORDS: Lobes of lungs, horizontal fissure, oblique fissure, pulmonary anatomy.

INTRODUCTION

It is from the laryngotraheal tube larynx, trachea, bronchi, lungs develop. Two bronchial buds are developed after division of caudal end of laryngotraheal tube. In the 5th week, right and left main bronchi are formed by the enlargement of right and left bronchial buds. Right main bronchus give rise to three secondary bronchi around which there is development of 3 lobes of right lung, while left bronchus divides into secondary bronchi around which there is development two lobes of left lungs [¹]. Variations occur during the development of lung. There may be incomplete development of oblique and horizontal fissures. In some they may be absent. As a result there may be reduction in the
number of lobes. Sometimes, there may be extra fissures dividing the lung. As a result left lung may have three lobes and right lung may have two lobes. In 1.5% of population there may occur accessory lobe in right lung. This is called azygos lobe. Very rarely a large azygos lobe may occur as the bifurcated apex \cite{2}. According to Craig and Walker, fissures of the lungs are classified into four grades. They are

Grade 1 - Complete fissure with entirely separate lobes
Grade 2 - Complete visceral cleft but parenchymal fusion at the base
Grade 3 - Visceral cleft evident for part of the fissure
Grade 4 - Complete fusion of the lobes with no evident fissural line

According to above authors, in oblique fissure lies pulmonary artery which is centrally placed. This relationship of the pulmonary artery to the oblique fissure is described by the term ‘fissural balance’. When there is anterior or posterior displacement of artery, then artery is referred to as anterior or posterior imbalance. \cite{3}

CASE REPORTS
During the dissection of thoracic cavity on a cadaver in the department of anatomy at Medicity Institute of Medical Sciences, it was incidentally found that in right lung there was absence of horizontal fissure. In both lungs oblique fissures were measured.

OBSERVATIONS
On close examination of both lungs, they were found to be of normal size and shapes. Hilum in both lungs was normal. Regarding fissures, right lung showed absence of horizontal fissure. But oblique fissures were present in both lungs. In the right lung, oblique fissure separates superior and middle lobe from inferior lobe. It extends up to the inferior border. It measures 28cm. The left lung shows oblique fissure measuring 26.7cm. There were no other anomalies seen in both the lungs. So in both the lungs two lobes were present. There was neither azygos lobe nor supernumerary lobes.

DISCUSSION
Meenakshi et al did a study on morphological variations of lung in department of anatomy at St. John’s Medical College, Bangalore. Study on 30 pairs of lungs showed absence of horizontal fissure in 5 right lungs, incomplete horizontal fissure seen in 19 lungs. In 11 right lungs, and 14 left lungs, there were incomplete oblique fissure. In 2 right lungs there was absence of horizontal fissure and incomplete oblique fissure. In3 left lungs and 1 right lung
there was accessory fissure \([^4]\). A study done by Murlimanju et al on morphology of fissures and lobes of the lung in South Indian population have shown fissures and lobes in 53.3\% described similar to standard text books of Anatomy. Studies have shown that in right lung, 15(46.9\%) lungs have shown incomplete horizontal fissure, while absence of horizontal fissure were seen in 6 (18.7\%) lungs. One lung showed (3.1\%), azygos lobe. Other 10 lungs (31.3\%) showed unusual morphology. In left lung normal morphology was seen in 22 cases (78.6\%), 2 lungs showed incomplete oblique fissure (7.1\%), 1 lung (3.6\%) showed absence of oblique fissure. An accessory fissure and lobe was seen in one lung and in one lobe (3.6\%). In 2 cases (7.1\%), anomalous multiple fissures and lobar pattern were observed \[^5\].

Prakash et al (2010) did a study on 29 cadavers. Morphological features like number, fissures and lobes were studied for the presence of anatomical variations. In 27.2\% of lungs studied, one accessory lobe on the inferior aspect was observed. They also observed supernumerary fissures most commonly in right lower lobe 35\%. In 7.1\%, the horizontal fissure was absent in right lung and incomplete fissure was observed in 50\% of right lungs, while oblique fissure was absent in 7.1\%, incomplete fissure in 39.3\% of right lungs. In the left lung, oblique fissure was absent in 10.7\%, and incomplete fissure was present in 35.7\% \[^6\]. Gesase AP (2006), did a study in the dissection room on102 lung specimens for the presence of accessory fissure and anomalies in the major fissure and lobation in both the right and left lungs. Study showed fissural or lobation anomalies in 37.26\% lung specimens and were more in the (63.00\%) right lungs. In 28.44\%, fissural anomalies were seen and in 8.82\%, lobation anomalies were observed. The abnormal fissure like left minor fissure 10.78\%, incomplete horizontal fissure 7.84\%, diaphragmatic fissure 7.84\%, right minor fissure 0.98\% and azygos fissure 0.98\%. were found. In addition, 5.88\% of the right lungs showed two lobes and three lobes were seen in left lung in 2.94\%. So their study showed that the right lung was more commonly affected with fissural and lobation anomalies and in the left lung minor fissure was commonly occurring fissural anomaly (Gesase AP) \[^7\].

**PRESENT STUDY**

Present study showed both lungs normal in size and shape. Regarding fissures, horizontal fissure was absent in right lung, oblique fissure was present in both lungs and two lobes were present in both lungs. There was no middle lobe due to absence of horizontal fissure in the right lung. Oblique fissure in right lung measured 28cm while in left lung measured 26.7 cm in the left lung. There was no incomplete horizontal fissure, azygos lobe, supernumerary
fissures. In Our study also anomaly[ absence of horizontal fissure] was found in the right lung like that of Gesase AP.

IMPORTANCE OF LOBES AND FISSURES
According to the above authors, lobes and fissures of lung have paramount clinical importance especially to thoracic surgeons and radiologists. Knowledge of variations of lobes and fissures of lungs is very much required by clinicians for accurate interpretation on different imaging techniques and also for the thoracic surgeons to carry out lobectomies and segmental resection. It is through interpretations of MRI and CT scans, radiologists get an idea about these variations. Documentation and familiarization of these variations are very much essential. Knowledge of fissures is of profound importance to plan the surgery on incomplete fissure which cause air leakage after surgery.

Photograph1 - showing Absence of horizontal fissure in the right lung while length of oblique fissure was 28cm

Photograph2 - showing left lung with showing oblique fissure measuring 26.7cm

CONCLUSION
Knowledge of anatomical variations of lung is required by clinicians for accurate interpretation on different imaging techniques by radiologists.

TAKE HOME MESSAGE
Anatomical variations of lung have to be studied in detail whether it is solitary, unilateral, bilateral or associated with any other congenital anomalies for proper diagnosis and management.
REFERENCES


