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RESEARCH ARTICLE

**ABSENCE OF RIGHT HORIZONTAL FISSURE AND LEFT OBLIQUE FISSURE IN A PAIR OF LUNGS
 – A CADAVERIC CASE REPORT.**

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Abstract

Introduction: Situated on either sides of the heart and other structures in the mediastinum, and occupying the major part of the thorax, the pair of lungs act as the essential organ of respiration. Generally right lungs is divided into three lobes by one right horizontal and one right oblique fissure while the left lung is divided into two lobes by left oblique fissure. Variation in embryological origin may cause incompleteness or absence of fissures and thus changes in lobar arrangements.

Material & Method: During performing routine dissection for undergraduate students, this rare case was noticed in the lungs of a 58 years old formalin fixed female cadaver in the Department of Anatomy of Regional Institute of Medical Sciences, Imphal. The specimen was photographed and comparisons were made with normal ones.

Result: The right lung showed the presence of a single fissure. The oblique fissure was present and it divided the lung into two lobes namely upper and lower lobe. However, horizontal fissure was absent. In the left lung, there was absence of the oblique fissure. Costal surface and structures passing through hilum were normal in both sides.

Conclusion: The lung fissures enhance uniform expansion, and can be used as reliable landmarks in thoracic lesions. Surgically, the gradation of fissure is important for approaching the ligation of vessels and bronchi through the depth of the fissure. Knowledge of anatomical variation in fissures is important for segmental resections, lobectomies and radiological reporting of lung pathologies.

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Introduction:-

Situated on either sides of the heart and other structures in the mediastinum, and occupying the major part of the thorax, the pair of lungs act as the essential organ of respiration. Generally right lungs is divided into three lobes by one right horizontal and one right oblique fissure while the left lung is divided into two lobes by left oblique fissure.

The variation in the appearance of the fissures can be attributed to their embryological origin. In prenatal life, individual bronchopulmonary segments are separated by fissures, which are gradually obliterated. Major (oblique) and minor (horizontal) fissures exist due to persistence of the fissures along the inter-lobar planes. In cases where

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these prenatal fissures undergo complete or partial obliteration, there is absence or incompleteness of the fissures (Magadum et al., 2015).

A classification of fissure was proposed by Craig and Walker, which showed 4 grades depending on the presence of the pulmonary artery at the base of the oblique fissure and also its completeness. 4 grades are Grade 1--complete fissure with entirely separate lobes; Grade 2--complete visceral cleft but presence of parenchymal fusion at the base of the fissure; Grade 3--visceral cleft evident for a part of the fissure; Grade 4--complete fusion of the lobes but with no evident fissural line. Thus oblique fissure of the right lungs in the present study falls under Grade 1, whereas horizontal fissure of right lung and oblique fissure of left lung fall under grade 4 (Craig SR and Walker WS, 1997).

If we have knowledge of such variations, certain clinical cases pertaining to lung pathologies can be explained. In addition, knowledge of the frequency of occurrence of a variant fissure in a particular population might help the radiologist and clinician to make correct diagnosis.

Aims & Objectives:-

1. To study morphology of the fissures and lobes.
2. To detect any variation if present.
3. To compare with the findings in other studies and depicting the clinical relevance.

Material & method:-

During performing routine dissection for undergraduate students, this rare case was noticed in the lungs of a 58 years old formalin fixed female cadaver in the Department of Anatomy of Regional Institute of Medical Sciences, Imphal, India. The specimen was photographed and comparisons were made with normal ones.

Result:-

The right lung showed the presence of a single fissure. The oblique fissure was present and it divided the lung into two lobes namely upper and lower lobe. The oblique fissure started approximately at the level of the spinous process of T4 level of thoracic spine and it crossed the fifth intercostals space and roughly followed the contour of the sixth rib anteriorly. Depth of the fissure was about 1.5 cm proximally, 2 cm at the terminal part, 2.5 cm in the deepest part. No accessory fissure was there. Horizontal fissure that divides the right lung into additional middle lobe normally, was absent. The rest of the costal surface was smooth with impression of ribs visible. Structures in the hilum were all normal in position as well as the impressions over the medial surface were all intact.

In case of the left lung, there was complete absence of the oblique fissure. Costal surface was convex and smooth in appearance. Structures in hilum were normal with intact impressions along medial surface. No accessory lobe was visible and lingula was normal.

Discussion:-

After examination of 1200 pairs of lungs it was found that incomplete oblique fissure was present in 10.6% of left lung and oblique fissures were absent in 7.3% of the left-sided lung (Medlar E.M, 1947).

In a CT scan study, analysis of both lungs in 154 patients, including seven cadavers, it was concluded that the frequency of the incomplete inter-lobar fissure was high in right sided lungs which was 83.1%, when compared to the left lungs that was 50% (Otsuji. H et al., 1993).

(Varalakshmi et al., 2014) and (Bhimai ND et al., 2011) reported the percentage of absence of the horizontal fissure in cases as 10% and 9% respectively.

Conclusion:-

The lung fissures enhance uniform expansion, and their position can be used as reliable landmarks in thoracic lesions. Incomplete fissures can alter appearance of pleural effusions and pattern of collapse. Surgically, the gradation of fissure is important in order to approach the ligation of vessels and bronchi through the depth of the fissure. Grade 1 oblique fissure facilitates the approach while doing lobectomy and video-assisted thoracoscopic surgery (Jennifer M.J. Richards et al., 2012). Else, the lung parenchyma has to be dissected to reach those

structures causing intra-operative haemorrhage and more postoperative complications (**John A.Waldhausen et al., 1996**). Knowledge of anatomical variation in fissures is important for segmental resections, lobectomies and radiological reporting of lung pathologies (**Hema L, 2014**).



Right Lung (Costal Surface)



Right Lung (Mediastinal Surface)



Left Lung (Costal Surface)

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