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MORPHOMETRIC ANALYSIS OF HUMAN CADAVERIC LUNGS

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ABSTRACT

Introduction: Human lung, both right as well as left shows lot of variations in their length, breadth, thickness from person to person. Even the fissures and lobes in both the lungs show a variety of variations as shown by previous workers¹⁻⁷. Apart from studying the variations of fissures and lobes in this study we have measured the length, breadth and thickness of both right and left Lungs and we have also measured the length and depth of transverse and oblique fissures of both the lungs right and left. Such measurements have not been done previously.

Aims and objectives: To study the normal length, breadth and thickness of both, right and left lungs and also to study the variations in the length, breadth and thickness, of both right and left lungs and finally to study the normal fissures, lobes and their variations, of both right and left lungs.

Materials and Methods: 13 Right and 14 left lungs obtained from embalmed cadavers, used for dissection in the Anatomy department, as a part of 1st year MBBS curriculum, of Geetanjali medical college and Hospital, Udaipur, formed the material for the current study.

Results: The left lung shows maximum variations of fissures in that they show an extra transverse fissure which is normally absent in the left lung. Out of 14 left lungs 5 of them that is 35.71%. Out of 14 left lungs 2 of them that is, 14.28% showed absence of oblique fissures. In case of right lungs out 13 only one of them that is, 7.69% showed absence of transverse fissures. Average measurements (length, breadth, thickness) of Right and left lungs have been measured.

Key Words: Lungs, Fissures, Variations

INTRODUCTION

Human lung, both right as well as left shows lot of variations in their length, breadth, thickness from person to person. Even the fissures and lobes in both the lungs show a variety of variations as shown by previous workers¹⁻⁷

Apart from studying the variations of fissures and lobes in this study we have measured the length, breadth and thickness of both right and left Lungs and we have also measured the length and depth of transverse and oblique fissures of both the lungs right and left. Such measurements have not been done previously.

Since surgeries on lung like lobectomy and other procedures like bronchoscopy, requires a thorough knowledge of normal measurements of lungs, their fissures and their variations, which prevents undue complications during surgery, this study was undertaken.

Also a thorough knowledge of the variations helps us to understand the development of lungs including their molecular regulations better.

Aims and objectives:

1. To study the normal length, breadth and thickness of both, right and left lungs.
2. To study the variations in the length, breadth and thickness, of both right left lungs.
3. To study the normal fissures, lobes and their variations, of both right and left lungs.

MATERIALS AND METHODS

13 Right and 14 left lungs obtained from embalmed cadavers, used for dissection in the Anatomy department, as a part of 1st year MBBS curriculum, of Geetanjali medical college and Hospital, Udaipur, formed the material for the current study.

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Each lung was washed with water and carefully measured using a thread and flexible measuring tape (Fig1). Length, breadth, thickness of both right and left lungs were measured and recorded. So also the length of fissures (both horizontal and oblique fissures in case of right lung and oblique fissure in case of left lung), their depth were measured and recorded. Any unusual or rare variations were photographed using a digital camera (Fig 2).

So obtained measurements were subjected to statistical analysis to obtain the mean values which would be of importance for cardiothoracic surgeons and pulmonologists.

Observations and results:

Table 1: Mean length, breadth and thickness of right and left lungs

	Mean length in cm	Mean breadth in cm	Mean thickness in Cm
Right lung	21.60 + 4.13	8.96 + 1.24	15.3 + 2.71
Left Lung	21.28 + 3.36	7.20 + 1.46	11.50 + 2.68

Table 2: Mean length of oblique and horizontal fissures

	Mean length of oblique fissure in cm	Mean length of horizontal fissure in cm
Right lung	23.76 + 7.34	10.73 + 4.46
Left lung	22.06 + 3.43	3.08 + 0.69

Table 3: Mean depth of oblique and horizontal fissures

	Mean depth of oblique fissure in cm	Mean depth of horizontal fissure in cm
Right lung	4.94 + 1.52	3.1 + 1.95
Left lung	3.07 + 0.70	0.38 + 0.19

Variations in the length, breadth and thickness:

The mean length (vertical) of right lung was 21.60 + 4.13, the longest of them all measured 29.4cm and shortest measured 15cm (table no.1)

The mean breadth (transverse) of right lung was 8.96 + 1.24, the broadest of them all measured 11.4cm and narrowest measured 7.3cm (table no.1)

The mean thickness (Antero-posterior) of right lung was 15.3 + 2.71, the thickest of them all measured 22.2cm and thinnest measured 10.6cm (table no.1)

The mean length (vertical) of left lung was 21.28 + 3.36, the longest of them all measured 25.9cm and shortest measured 15cm (table no.1)

The mean breadth (transverse) of left lung was 7.20 + 1.46, the broadest of them all measured 10cm and narrowest measured 5cm (table no.1)

The mean thickness (Antero-posterior) of left lung was 11.50 + 2.68, the thickest of them all measured 16.8cm and thinnest measured 7.5cm (table no.1)

Variations in the fissures and lobes:

5 left lungs showed transverse fissures (Fig 2), their details are given in table no.2

2 left lungs showed absence of oblique fissures.

1 right lung showed absence of transverse fissures.

Measurements of fissures of both left and right lungs are given in table no.2 and table no.3



Figure 1: Showing measurement of oblique fissure of right lung using a thread



Figure 2: Left lung showing transverse fissure and right lung showing incomplete transverse fissure

DISCUSSION

We have seen that the left lung shows maximum variations of fissures in that they show an extra transverse fissure which is normally absent in the left lung. Out of 14 left lungs, 5 of them that is 35.71% of left lung showed transverse fissures where as a previous study has shown only 8%².

Out of 14 left lungs, 2 of them that is 14.28%, showed absence of oblique fissures where as a previous study has shown only 3.6%¹. Yet another study showed only 10.7%⁴.

In case of right lungs out 13, only one of them, that is 7.69% showed absence of transverse fissure where as previous studies have shown 18.7%¹ and 7.1%⁴.

Apart from studying the variations of fissures and lobes in this study we have measured the length, breadth and thickness of both right and left Lungs (table no. 1) and We have also measured the length and depth of transverse and oblique fissures of both the lungs right and left (table no. 2 & 3). Such measurements have not been done previously.

Knowledge of normal measurements of lungs, their fissures and their variations helps cardiothoracic surgeons to avoid undue complications during surgery. Also it helps radiologist to make accurate diagnosis in case of lung pathologies.

SUMMARY AND CONCLUSIONS

Average measurements (length, breadth, thickness) of Right and left lungs have been measured. Left lung and right lung show variations in their length, breadth and thickness. They also show variations in appearance (presence/absence) and measurements of fissures. Left lung shows maximum variations in both transverse and oblique fissures.

Knowledge of normal measurements of lungs their fissures and their variations helps cardiothoracic surgeons to avoid undue complications during surgery. Also it helps radiologist to make accurate diagnosis in case of lung pathologies.

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