

بسم الله الرحمن الرحيم



-Call 4000





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم





جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة يعبدا عن الغبار













بالرسالة صفحات لم ترد بالأصل



Validity of Pleural Sliding Sign in Patients on Controlled Mechanical Ventilation

Thesis
Submitted for Partial Fulfillment for
Master Degree in Chest Diseases

By
Shahir Maged Onsy Habib
(M.B.B.Ch.)
Cairo University

Supervised by

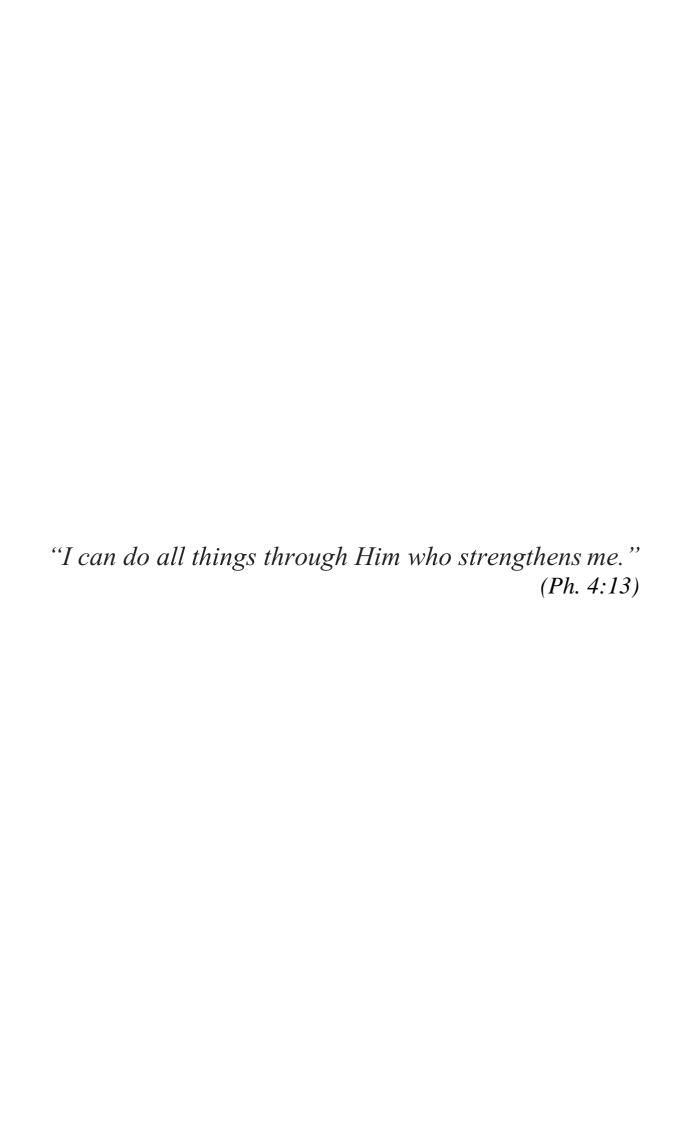
Prof. Dr. Magdy Mohammed Khalil

Professor of Chest Diseases Faculty of Medicine Ain Shams University

Prof. Dr. Hala Mohamed Salem

Professor of Chest Diseases Faculty of Medicine Ain Shams University

> Chest Department Faculty of Medicine Ain Shams University 2020



Acknowledgments

It's a genuine pleasure to express my deep appreciation and gratitude to **Professor Dr. Magdy Mohamed Khalil**, Professor of Chest Diseases, Faculty of Medicine, Ain Shams University, for his dedication, his overwhelming attitude to help, guide and encourage me during this work. His timely advice, meticulous scrutiny and his scholarly guidance without whom this work would have not been possible.

I am deeply grateful to **Professor Dr. Hala Mohamed Salem**, Assistant Professor of Chest Diseases, Faculty of Medicine, Ain Shams University, for her keen interest in me on every stage of this work, her continuous support, guidance and unparalleled knowledge through all of my study, working under her supervision was a great honor.

Lastly, I would love to thank **my colleagues** in Abbaseya Chest Hospital for their cooperation and endless help.

Contents

List of tables	1
List of Figures	ii
List of abbreviations	iv
Preface	1
Aim of work	3
Literature Review	4
Patients and Methods	47
Statistical analysis	50
Results	51
Discussion	59
Summary	65
Conclusion	67
Recommendations	68
References	69
Arabic summary	77

List of Tables

Table	Title	Page		
Number		Number		
1	Demographic characteristics of the studied group	51		
2	Diagnosis of the studied group of patients			
3	Comorbidities of the studied group of patients			
4	Modes of Mechanical Ventilation used for the studied			
	group of patients			
5	Detection of Lung Sliding Sign by the Linear Probe in	56		
	Different Intercostal Spaces			
6	Comparison between the conclusiveness of the linear	57		
	and curved probe in detecting lung sliding sign			

List of Figures

Figure	Title	Page		
Number		Number		
1	Diagram of transducer that sends and receives the	14		
	waves			
2	Ultrasound examination of the chest	18		
3	Normal ultrasound images of the chest	18		
4	Subcostal ultrasound image shows some ring-down	19		
	artifacts	21		
5	Position to displace the scapulae during ultrasound	21		
	examination	22		
6	6 Longitudinal and transverse images showing the bright			
	surface echo produced by the ribs and the dense			
	acoustic shadow resulting from marked sound			
	absorption by bone			
7	Longitudinal image obtained through the liver shows			
	the bright interface of the diaphragm with air-filled			
	lung above it			
8	Stages of Chest Ultrasound examination	25		
9	Ultrasonographic images showing the normal lung	26		
	pattern			
10	A Lines sign			
11	B Lines sign	27		
12	The primitive lungs grow into the pleural cavity,			
	covered by the visceral pleura, which invaginate with			
	the lung buds			
13	Surface anatomy of the pleura	30		
14	The Visceral pleura covers the entire lung parenchyma	33		
	including the interlobar fissures			
15	The pulmonary ligament hanging inferiorly, made up	33		
	of two layers of pleura			
16	Lateral view of the left hilum showing the anatomy of	36		
	left inferior pulmonary ligament			

17	Lateral view of the right hilum showing the anatomy of			
	right inferior pulmonary ligament			
18	Pleural reflections at the level of the right triangular			
	ligament			
19	Anterior projection of the anterior costomediastinal			
	recesses and intrapleural triangles			
20	Projection of the right costodiaphragmatic recess and	41		
	sinus			
21	Anterior thoracic wall reflected upwards with left			
	internal thoracic and left lateral costal vessels shown on			
	its internal aspect			
22	Carbon deposits in subpleural lymphatics			
23	Gender Analysis			
24	Smokers vs Non-smokers			
25	Diagnosis of the Studied Group of Patients			
26	Co-morbidities of the Studied Group of Patients	54		
27	Modes of Mechanical Ventilation used for the Studied	55		
	Group of Patients			
28	Detection of Lung Sliding Sign by the Linear Probe in	56		
	Different Intercostal Spaces			
29	The conclusiveness of Linear vs Curved Probes in	57		
	detecting Lung Sliding sign			
30	Examining the two doubtful cases by M-Mode using	58		
	the curved probe			
21	M Made showing the Dones de sign vaine the	50		
31	M-Mode showing the Barcode sign using the curved probe	58		
	proce			

List of Abbreviations

MHz	Megahertz
Hz	Hertz
KHz	Kilohertz
CT	Computed tomography
MRI	Magnetic resonance Imaging
CXR	Chest X-ray
B-Mode	Brightness Mode
M-Mode	Motion Mode
COPD	Chronic Obstructive Pulmonary
	Disease
PEEP	Positive End Expiratory Pressure
ICU	Intensive Care Unit
Kg	Kilogram
ml	Milliliter
mm	Millimeter
cm	Centimeter
min	Minute
I:E	Inspiration: Expiration
SD	Standard Deviation
No.	Number
ARDS	Acute Respiratory Distress Syndrome
HIV	Human Immunodeficiency Virus
PJP	Pneumocystis Pneumonia
ILD	Interstitial Lung Disease
IPF	Idiopathic Pulmonary Fibrosis
CVC	Central venous catheter

UK	United Kingdom
AP	Anteroposterior

Preface

Chest ultrasonography is useful in the evaluation of a variety of peripheral parenchymal, pleural, and chest wall diseases. (Koh et al., 2002)

Diseases of the pleura and pleural space are common and represent a significant contribution to the work load of pulmonologists. Pleural involvements are common and many respiratory diseases including inflammatory, infectious, occupational, and neoplastic pathological entities may occur. Etiological diagnosis imposes a vast and sometimes difficult exploration. (**Duysinx et al.**, 2008)

Transthoracic ultrasound is the best modality for detecting pleural effusions and the presence of septations. (Fournier,1997)

Ultrasound has been proved to be of a great value for the evaluation of a variety of chest diseases, particularly when the pleural cavity is involved. Pleural effusion, pleural thickening, pleural tumors, consolidations, tumor extension into the pleura and even the chest wall and pneumothorax can be detected easily and accurately with chest ultrasound. The advantages of low-cost, bedside availability and no radiation exposure have made ultrasound an indispensable diagnostic tool in modern pulmonary medicine. (**Tsai and Yang, 2003**)

There are a lot of clinical indications for chest ultrasound but the most common are pneumothorax and pleural effusion detection and assessment. Transthoracic ultrasound can diagnose inoperable pleural metastases, allow safe pleural fluid tapping, exclude significant pleural pathologies that are not