Assessment of Diaphragmatic Mobility by Chest Ultrasonography in Patients Undergoing Pleurodesis

Thesis

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بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

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List of Abbreviations

Abb.	Full term
ADA	*Adenosine deaminase*
BTS	*British thoracic society*
CHF	*Congestive heart failure*
CSF	*Cerebrospinal fluid*
CT	*Computed Tomography*
DE	*Diaphragmatic Excursion*
DUS	*Diaphragmatic ultrasound*
F	*Frensh*
LDH	*Lactate dehydroxylase*
LS	*Lung sliding*
MHz	*Mega hertz*
MPE	*Malignant pleural effusion*
NLS	*No lung sliding*
PET	*Positron Emission Tomography*
PSP	*Primary spontaneous pneumothorax*
SD	*Standard deviation*
TB	*tuberculosis*
TUS	*Thoracic ultra sound*
UP	*Ultrasound Pattern*
US	*Ultrasound*
VATS	*Video assisted thoracoscopic surgery*

INTRODUCTION

The aim of pleurodesis is to achieve a symphysis between visceral and parietal pleural layers, in order to prevent accumulation of either air or fluid in the pleuralspace. Its main indications are malignant pleural effusions and pneumothorax ***(Rodriguez and Lopez, 1989).***

Pleurodesis can be done chemically or surgically chemicals such as Bleomycin, Tetracycline, Povidone iodine and talc ***(Chen et al., 2013).***

Chemical pleurodesis involves the intrapleural instillation of a sclerosant through a chest catheter or by thoracotomy or thoracoscopy. Chemical pleurodesis by chest catheter uses an intercostal catheter to drain pleural fluid, reexpand the lung against the chest wall, and instill a sclerosant. Large-bore (20 to 32F) surgical chest tubes have become obsolete in preference for small-bore pigtail catheters (9 to 14F), which improve patient tolerance, provide options for outpatient pleurodesis, and have equivalent rates of success ***(Caglayan et al., 2008).***

Surgical pleurodesis may be performed either via thoracotomy or thoracoscopy; leading to mechanical irritating in the parietal pleura ***(Warren et al., 2008).***

Pleurodesis will certainly fail if the lung cannot fully expand to the chest wall (eg, trapped or entrapped lung, interstitial pulmonary fibrosis, endobronchial obstruction) because successful pleurodesis requires contact of the visceral and parietal pleura. Chemical pleurodesis should therefore not be attempted when full lung expansion to the chest wall does not occur after therapeutic thoracentesis. Patients whose lungs cannot fully expand usually have radiographic evidence of a pneumothorax after thoracentesis or experience chest discomfort during thoracentesis before all pleural fluid is drained ***(Doelken, 2008).***

The most common adverse sequelae of chemical pleurodesis are fever, pain, and GI symptoms ***(Shaw and Agarwal, 2004).***

A complete response is usually defined as no re-accumulation of pleural fluid after pleurodesis until death, and a partial response as partial re-accumulation of fluid radio graphically but not requiring further pleural intervention such as aspiration. However, some studies use a 30 day cut-off ***(BTS, 2009).***

Diaphragm is the principal generator of tidal volume in normal subjects at rest. Studies have shown that the impairment of diaphragm mobility might be associated with alterations in the principal pulmonary function parameters ***(Yamaguti et al., 2008).***

Chest ultrasonography has many Uses, both diagnostic and interventional. It can be used in diagnosis of diseases of the chest wall such as enlarged lymph nodes, rib abnormalities and also diaphragmatic abnormalities like diaphragmatic paralysis. Chest ultrasonography can also be used in interventional procedures of the pleural space such as thoracocentesis and pleural biopsy. In lung cancer, peripheral lung tumors that are in contact with or near the pleural surface can be safely biopsied under US guidance ***(Havelock et al., 2010).***

Over the past few years, ultrasound has also been used to evaluate diaphragmatic mobility, since it offers some advantages over fluoroscopy: portability; no exposure to ionizing radiation; and direct quantification of diaphragmatic movement ***(Houston et al., 1995).***

AIM OF THE WORK

To assess the diaphragmatic mobility using Chest Ultrasound in patients with malignant pleural effusion before and after pleurodesis.