Evaluation of rapid pleurodesis technique in patients with malignant pleural effusion

Thesis

Submitted for partial fulfillment of Master Degree in Pulmonary Medicine and Tuberculosis

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2017

تقييم تقنية الإلتصاق البلوري السريع في مرضى الإنسكاب البلوري السرطاني

رسالة

توطئة للحصول علي درجة الماجستير في الأمراض الصدرية والتدرن

مقدمة من

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٢٠١٧

سورة البقرة الآية: ٣٢

Acknowledgement

First and foremost thanks to ALLAH, the Most Merciful.

I wish to express my deep appreciation and sincere gratitude ***Prof. Dr. Muhammed Ali Farrag,*** *professor of chest disease, Ain Shams University, for his close supervision, valuable instructions, continuous help, patience, advices and guidance. He has generously devoted much of his time and effort for planning and supervision of this study. It was a great honor to me to work under his direct supervision.*

I wish to express my great thanks and gratitude to ***Ass. Prof. Dr. Haytham Samy Diab****, professor of chest disease, Ain Shams University, for his kind supervision, indispensable advice and great help in this work.*

Last and not least, I want to thank all my family, my colleagues,, for their valuable help and support.

Finally I would present all my appreciations to my patients without them, this work could not have been completed.

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List of Abbreviations

MPE	:	Malignant pleural effusion
D.M	:	Diabetes mellitus
HTN	:	Hypertension
ISHD	:	Ischemic heart disease
CR	:	Complete response
PR	:	Partial response
NA	:	Not available
SD	:	Standard deviation
SIG	:	Significance

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Abstract

Introduction: The management of patients with malignant and/or recurrent pleural effusions is cumbersome and can present important diagnostic and therapeutic challenges.

Aim of the work: To evaluate the effectiveness of rapid pleurodesis technique in malignant pleural effusion in comparison to standard.

Subjects and methods: A prospective, randomized method was utilized to compare standard method of pleurodesis with the proposed new rapid pleurodesis process in patients with symptomatic malignant pleural effusion using pigtail for drainagetechnique.

Results: A total of 30 patients (16 male , 14 female) with malignant pleural effusion will be included in this study . devided into group 1 submitted to standard pleurodesis technique using 24F to 28F thoracostomy tube for drainage (10 patients) group 2 submitted to rapid pleurodesis technique using pigtail for drainage (20 patients).

Discussion: Malignant and/or recurrent pleural effusions are associated with significant morbidity. The key point to achieve successful pleurodesis is the ability to fully drain the pleural space and to re-expand the lung. Prompt clinical evaluation followed by aggressive treatment often results in successful palliation. Treatment response for MPE is highly variable. We have developed a new method of rapid pleurodesis, which worked effectively in patients with short survival expectations.

Conclusion: Rapid pleurodesis can offer similar results to those reported for traditional techniques, This technique is easy to apply and constitutes a minimally invasive procedure. Ambulatory, pigtail insertion is a feasible management option in several pleural pathologies. It is easily tolerated, can be managed at home with an improved quality of life, and is potentially less costly in resource constrained environments.

Key word: Evaluation of rapid pleurodesis technique in patients with malignant pleural effusion.

Introduction

The management of patients with malignant and/or recurrent pleural effusions is cumbersome and can present important diagnostic and therapeutic challenges ***(Belani CP, et al, chest 1998).***

Pleural effusion causing symptoms such as chest pain and dyspnea is a common problem that causes significant morbidity and can negatively affect quality of life of patients for their remaining months. Despite management of underlying malignancy with chemo/radiotherapy, malignant pleural effusions (MPE) may persist or recur and necessitate palliative interventions in order to control or alleviate the symptoms. Several palliative treatment options are available including therapeutic thoracentesis, tube thoracostomy, chemical pleurodesis, video thoracoscopic pleurodesis and pleuroperitoneal shunt ***(Putnam, Surf Clin North Am 2002), (Antony VB, et al, Eur Respir.2001).***

Pleurodesis is performed to inflame the visceral and parietal pleura to fuse the pleura together obliterating the potential pleural space. Pleurodesis with sclerosing agents has a high success rate but requires hospitalization for up to 6 days until chest tubes can be removed . It is generally considered standard treatment for recurrent MPE. Asbestos-free talc has been established as the most effective agent for pleurodesis ***(Antunes, et al, Thorax 2003).***

However, various factors have impact on the success of pleurodesis include initial drainage time, chest drain diameter, management of the chest drain (suction, no suction), etc ***(Sahn, General Thoracic Surgery. 7th edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2009)*.**

Success and length of stay of the patients (5-7 days) are of utmost importance since patients with malignant pleural effusion are usually critically ill and/or moribund. In these patients with an expected survival of only 8 months, the aim of a palliative intervention should be reliable alleviation of dyspnea, improving quality of life, shortening hospital stay as much as possible and keeping the duration of chest tube drainage as short as possible. Traditional catheter drainage of malignant pleural effusion includes tube insertion, daily observation and pleurodesis if daily drainage is <200-400 mL and re-expansion of the lung is provided. However, this approach may lead to very long hospitalization time with limited success of the procedure. We investigated the value and effectiveness of a rapid pleurodesis method using doxycycline in patients with potentially recurrent pleural effusion. Our secondary hypothesis was whether rapid pleurodesis would decrease the length of hospitalization or not ***(Rodriguez-Panadero, et al, Eur Respir. 1997)***.

Aim of the work

To evaluate the effectiveness of rapid pleurodesis technique in malignant pleural effusion in comparison to standard technique

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Indications And Outcome Of Pleurodesis

The term pleurodesis comes from the Greek pleura-desis and consists of the fusion of both pleural sheets (parietal and visceral). Pleurodesis dates back to the beginnings of thoracic surgery ***(Bethune, 1935)***. In order to obtain this objective, different techniques have been employed, such as the instillation of products (chemical or medical pleurodesis) or surgical techniques (mechanical or surgical pleurodesis).

The ideal sclerosing agent should be low-cost, readily available, easy to use, relatively free of side effects, and highly efficient ***(Dikensoy et al., 2005)***. Chemical pleurodesis stands out because it is easy to carry out, has a great variety of sclerosing agents and has been proven effective.

Surgical pleurodesis is a mechanical aggression of the parietal pleura to achieve the desired effect. Before pleurodesis is performed, the lung must be fully inflated and, because this is a palliative procedure, the patient should report symptomatic improvement after pleural fluid drainage ***(Lynch, 1993)***.

Clinical indications:

1-Recurrent spontaneous pneumothorax

Emphysematous and bullous disease is one cause of persistent pneumothorax. For pneumothorax without a persistent air leak, conservative medical management such as observation and/or chest tube drainage is considered the standard treatment. However, pneumothorax with persistent air leak may be lifethreatening in some patients, requiring more definitive treatment such as surgery to close the air leak or pleurodesis. In past decades, mechanical pleurodesis such as pleural abrasion or blebectomy was used for recurrent pneumothorax.

In cystic fibrosis, lymphangioleiomyomatosis, and thoracic endometriosis, persistent pneumothoraces can occur, but use of pleurodesis in this setting is controversial.

2-Recurrent pleural effusion

Benign pleural effusion

Recurrent accumulation of benign pleural effusions is caused by pleural fluid imbalance due to excessive production of pleural fluid, decreased absorption, or a combination of both. Etiologies include inflammatory conditions, congestive heart failure, hepatic hydrothorax, and prior cardiac surgery. The use of pleurodesis for recurrent benign pleural effusions is controversial, and is only performed in exceptional circumstances ***(Matsubara et al., 2012).***

Malignant pleural effusion

Malignant pleural effusion causes substantial morbidity from dyspnea, cough, and chest pain, which may compromise patient mobility and affect quality of life. Migration of tumor cells to the pleural space results in obstruction of the lymphatic network and blood vessels, leading to pleural effusion. The principal goal in treating malignant pleural effusions is to improve respiratory status. A firstline approach to treating a malignant pleural effusion is systemic treatment including management of heart, kidney or liver failure, and therapy for the underlying malignancy.

However, if the pleural effusion fails to respond, a more targeted approach such as thoracentesis, pleural drainage, pleuroperitoneal shunt, pleurectomy and pleurodesis is often necessary. The British Thoracic Society has published guidelines for management of malignant pleural effusion ***(Roberts et al., 2010).*** They recommend observation if the patient is asymptomatic. Pleural effusions treated by aspiration alone are associated with a high rate of recurrence of effusion at 1 month, so this treatment is not recommended if life expectancy is more than a month. With very short life expectancy, therapy with an intercostal indwelling smallbore chest tube followed by pleurodesis is recommended for recurrent aspiration unless significant lung trapping is present.