

Use of Indwelling Pleural Catheter in the Management of patients with Malignant Pleural Effusion

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العليم

صدق الله العظيم

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In the name of ALLAH, most gracious, most merciful.

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Contents

Subjects Page	
• Abbreviation.....	I
• List of figures.....	II
• List of Tables.....	IV
• Introduction	1
• Aim of the work.....	6
• Review of Literature:	
Chapter 1: Pleura	7
Anatomy of the pleura	
Physiology of pleural fluid turnover	
Pathophysiology of pleural fluid accumulation	
Chapter 2: Diagnostic Approach to Pleural Effusion....	20
Chapter 3: Malignant pleural effusion	46
Chapter 4: Indwelling pleural catheter	101
• Subjects & Methods.....	128
• Results.....	141
• Discussion.....	160
• Summary & Conclusion.....	175
• Recommendations.....	179
• References.....	180
• Arabic summary	-

Abbreviation

ADA:	adenosine deaminase
CA:	cancer antigen
CAPD:	continuous Ambulatory peritoneal dialysis
CEA :	carcinoembryonic antigen
CT :	computerized tomography
CXR:	chest x-ray
EPP:	Extrapleural pneumonectomy
FVC:	Forced Vital Capacity
Hospital LOS:	hospital length of stay
IPC:	indwelling pleural catheter
IV:	intravenous
KPS:	karscoffy performance scale
LDH:	lactate dehydrogenase
MPE :	Malignant pleural effusion
MRI :	Magnetic resonance imaging
NSAIDs:	non steroid anti inflammtory drugs
NSCLC :	non small cell lung cancer
NT-Probnp :	N-terminal pro B-type natriuretic peptide
OPC :	outpatient clinic
PPD:	purified protein derivative
QALYs:	quality adjusted life year
RA :	rheumatoid arthritis
SD :	standard deviation
SLE:	systemic lupus erythematosus
TIPC:	tunneled indwelling pleural catheter
TLC:	total lung capacity
VATS :	Video-Assisted Thoracoscopic Surgery
WHO:	World Health Organization

List of Figures

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
Fig. (1)	Lines of pleural reflection.	9
Fig. (2)	Carbon deposits in subpleural lymphatics	12
Fig. (3)	Algorithm for the investigation of pleural effusions	45
Fig. (4)	Therapeutic options for management of MPE	77
Fig. (5)	Summary for management of MEP	100
Fig. (6)	The Pleural catheter drainage system	104
Fig. (7)	The evacuation of the pleural liquid in the patient's home	110
Fig. (8)	Dissemination of an adenocarcinoma through the pleural drainage insertion channel	114
Fig. (9)	Chest tube insertion	137
Fig. (10)	CXR shows left sided intercostals tube	138
Fig. (11)	CXR shows pleural catheter	140
Fig. (12)	Comparison of modified Borg dyspnea scale in group A& B before and after insertion of tube and catheter	145

List of Figures

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
Fig. (13)	Comparison of tube and catheter duration in group A& B	146
Fig. (14)	Comparison for length of hospital stay in Group (A) and Group (B)	147
Fig. (15)	Comparison of cost of hospital & medication in group (A) & (B)	148
Fig. (16)	Comparison of total cost in group A& B	149
Fig. (17)	Comparison of rate of successful pleurodesis and recurrence of effusion in Group (A) and Group (B)	150
Fig. (18)	Summary of adverse events among group A and B	152
Fig. (19)	Description of complication among group C	155
Fig. (20)	The relation between indwelling pleural catheter duration and spontaneous pleurodesis	158
Fig. (21)	The relation of modified Borg dyspnea scale in group C before and after insertion and in follow up visits with spontaneous pleurodesis.	159

List of Tables

<i>Tables No.</i>	<i>Title</i>	<i>Page No.</i>
Table (1)	Causes of Pleural Effusions: History, Signs, and Symptoms.	21
Table (2)	Useful further tests of pleural fluid for assessing the causes of pleural effusion	28
Table (3)	Considerations before placing IPC	107
Table (4)	Home management tips	111
Table (5)	Catheter complications	112
Table (6)	Advantages and disadvantages of IPCs	124
Table (7)	Baseline demographic data for all patients with malignant pleural effusion	142
Table (8)	Baseline demographic data for group A and B	143
Table (9)	Comparison of modified Borg dyspnea scale in group (A) & (B) before and insertion of tube and catheter	144

List of Tables

<i>Tables No.</i>	<i>Title</i>	<i>Page No.</i>
Table (10)	Comparison for need for hospitalization, length of hospital stay, and duration of tube & catheter in Group (A) and Group (B)	146
Table (11)	Comparison of cost of hospital & medication, maneuver and total cost in group (A) & (B)	148
Table (12)	Comparison of rate of successful pleurodesis and recurrence of effusion in Group (A) and Group (B)	150
Table (13)	Summary of adverse events among group A and B.	152
Table (14)	Baseline demographic data for group (C)	153
Table (15)	Description of spontaneous pleurodesis, effusion recurrence and further intervention among group C	154
Table (16)	Description of complication among group C	154
Table (17)	The relation between age and spontaneous pleurodesis	156
Table (18)	The relation between gender and spontaneous pleurodesis	156

List of Tables

<i>Tables No.</i>	<i>Title</i>	<i>Page No.</i>
Table (19)	The relation between the pleural effusion character and spontaneous pleurodesis	156
Table (20)	The relation between type of malignancy and spontaneous pleurodesis	157
Table (21)	The relation between indwelling pleural catheter duration and spontaneous pleurodesis	158
Table (22)	The relation between modified Borg dyspnea scale before and after insertion and follow up visits and spontaneous pleurodesis	159

INTRODUCTION

Malignant pleural effusion is a common complication of advanced malignancy (*American Thoracic Society, 2000*). It constitutes a frequent clinical problem in these patients associated with a poor prognosis and worsening their quality of life (*Snchez-Armengol and Rodrguez-Panadero, 1993*) as the vital prognosis is darkened and the survival average decreases by 3 to 12 months (*Burrows et al., 2000*).

Malignant pleural effusion affects 660 patients per million populations each year (*Marel et al., 1993*) and in the United States, approximately 100,000 cases of pleural effusions are caused by malignancy (*American Thoracic Society, 2000*).

Malignant pleural disease may be primary or secondary, Primary pleural tumors account for about 10% of cases; the most common is malignant mesothelioma (*Lombardi et al., 2010*), while secondary involvement of the pleura is much more common, Lung cancer is the most common of secondary tumors, and breast cancer is second and both account for 50-65% of cases while lymphomas, genitourinary, and gastrointestinal tumors represent about 25% (*Antunes and Neville, 2000*).

Approximately two thirds of malignant pleural effusions occur in women because of the strong association of malignant effusions with breast and ovarian cancer (**Rusch et al., 2009**).

The most important symptom associated with malignant pleural effusion is dyspnea (**Chernow and Sahn, 1977**) and it is usually subacute, progressing over days and weeks and may be associated with chest discomfort or cough. Symptoms associated with advanced malignancy such as weight loss, anorexia and fatigue can be present. In some cases, the pleural effusion is the initial presentation of an advanced malignancy while in others the effusion occurs as a sign of progression of the cancer (**Rusch et al., 2009**).

Despite treatment of the underlying malignancy with chemotherapy or radiation therapy, malignant pleural effusions often recur or do not resolve (**Haas et al., 2000**), various palliative techniques for the improvement of malignant pleural effusion have been developed to alleviate these respiratory symptoms as repeated thoracentesis which is a simple and widely used technique but it is insufficient for the treatment of recurring malignant pleural effusion, this is due to the fast and symptomatic reaccumulation of liquid that can occur four days after the thoracentesis (**Anderson et al., 1974**).

Another frequently employed techniques pleurodesis through tube thoracostomy. With this technique, longer lasting effects are obtained provided an adequate drainage of the pleural liquid is achieved, as well as subsequent symphysis of both pleural sheets. Various symphysant agents were used for this. The most commonly currently employed are talc, doxycycline and bleomycin (*Heffner et al., 2000*), but this procedure can be painful and requires hospitalization (mean stay was 7 days) (*Tremblay et al., 2007*).

In addition, there has also been interest in the use of less invasive techniques of fluid drainage and sclerosis, including the use of smallbore catheters in lieu of larger, standard bore chest tubes. The therapeutic indications for catheter placement have included treatment of empyema, pneumothorax, and drainage of pleural effusions, with or without sclerotherapy (*Chang et al., 1996*).

Pigtail catheter is a long, flexible tube that can be guided into the body. The design of this catheter includes small holes that allow for drainage and a coiled end that acts to hold the catheter in place (*Suzuki et al., 2011*), use of catheter placement can be using Seldinger technique (*Ghoneim et al., 2014*), or guided by ultrasound which ensure that the tube is placed just above the diaphragm to maximize drainage of the effusion (*Westcott, 1985*).

Recently, the use of pigtail catheter (flexible and small bore) by the Seldinger technique has emerged as an effective alternative for thoracostomy and pleural drainage. Being a less traumatic procedure, this method creates less pain and smaller scar during and after the placements and possibly fewer procedure associated complications (*Liang et al., 2009*).

A novel approach to the treatment of malignant pleural effusion is the use of a chronic indwelling pleural catheter for intermittent fluid drainage which has been reported to be effective in the palliative treatment of patients with malignant pleural effusion and it has gained popularity over the past few years, (*Brubacher and Gobel, 2003*) since its use is effective, safe, and well-tolerated (*Westcott, 1985*).

An ideal treatment method for malignant pleural effusion should offer a rapid and complete relief of associated symptoms. This improvement should be longlasting and without the need for repeat procedures for the duration of the patient's life time, minimally invasive procedures should be favored, and discomfort or side effects of the treatment should be minimal or nonexistent. If at all possible, treatment should be offered on an ambulatory basis minimizing hospitalization time for these patients who may have only a few months to live.

Introduction

The burden of this treatment should be minimal for both patients and their caregivers, Costs should be minimal and treatment should not interfere with other oncologic therapies. Finally, the treatment should be broadly applicable to a majority of patients suffering from malignant pleural effusion (*Mac Eachern and Tremblay, 2011*).