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MALIGNANT PLEURAL EFFUSION;

EFFICACY OF VIDEOASSISTED THORACOSCOPIC TALC PLEURODESIS IN THE SURGICAL MANAGEMENT OF PATIENTS

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ABSTRACT… Objectives: To assess the role of video assisted thoracoscopic talc pleurodesis in the surgical management of malignant pleural effusions by comparing this procedure with pleurodesis via talc slurry through an intercostals chest tube. **Design:** Prospective analysis of fifty patients with malignant pleural effusion which were divided into two groups. Group one included twenty patients while group two included thirty patients. **Setting:** Department of Thoracic Surgery and the Department of Oncology, Combined Military Hospital, Rawalpindi. **Period:** October 2008 till November 2010. **Subjects:** Fifty patients of malignant pleural effusion were included in the study. They were divided into two groups. Group one included twenty patients whereas group two included thirty patients. **Interventions:** Patients in group one were subjected to videoassisted thoracoscopic talc pleurodesis. Patients in group two were subjected to pleurodesis via talc slurry through an intercostal drainage tube. RESULTS: Fifty patients were included in the study. The mean follow up time was 5.7 months for group one and 5.5 months for group two. Out of the twenty patients in group one 95% had successful pleurodesis (defined as satisfactory pleurodesis three months post procedure). Adverse effects included fever in three patients (15%), empyema in one patient (5%) and malignant invasion of the scar in one patient (5%). Out of the thirty patients in group two 70% had successful pleurodesis. Adverse effects included fever in five patients (17%), empyema in one patient (3%), and pulmonary infection in one patient (3%). No mortalities occurred during the procedures in either of the group. **Conclusions:** Videoassisted thoracoscopic talc pleurodesis is a safe and effective method of producing reliable pleurodesis in patients with malignant pleural effusion. It is superior to pleurodesis via talc slurry through an intercostal drainage tube in terms of producing a reliable and complete pleurodesis. It should be performed early in patients presenting with malignant pleural effusions to avoid the risk of respiratory failure, this being directly linked to the general and respiratory status of the patients at the time of the procedure.

Key words: Malignant pleural effusion, pleurodesis, talc, video assisted thoracoscopy.

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INTRODUCTION

Malignant pleural effusion is a distinct clinical entity. Irrespective of its cause it demands a unified strategy for its management. Managing these patients is an arduous task and requires exceptional clinical skills and judgment. The physician has to focus on maintaining a fine parity between achieving optimum control over the patient's symptoms and the disease process and at the same time limiting the intervention to as little as be required in these ailing patients. Although curative therapies may not be the prime objective in patients with advanced malignant disease the advancements made in the field of oncology have come up with effective palliative therapies resulting in an increased mean survival of these patients. Good management of patients with malignant pleural effusions assumes paramount importance in today's oncologic practice, as it is an important determinant of the quality of life of these terminally ill patients.

Approximately half of all patients with metastatic cancer develop a malignant pleural effusion.[1] Only a few patients benefit from systemic therapy. Shortness of breath and a reduction of physical exercise capacity caused by a malignant pleural effusion imply a considerable deterioration in

patient's quality of life. The palliation of these symptoms requires an effective treatment with low failure rates, minimal procedure related morbidity and mortality and a short hospital stay.

Once the diagnosis is established local treatment is invariably required for symptomatic effusions. Simple drainage alone may provide adequate short term palliation but the fluid invariably re accumulates. Attempts at repeated aspirations carry the risk of introducing infection into the pleural cavity and also produces loculations owing to fibrosis making subsequent attempts at simple drainage less effective. The definitive occlusion of the pleural space appears to be the treatment of choice and should be instituted as early as possible. The most effective treatment has been to produce a sterile adhesive pleuritis. This requires complete removal of the pleural fluid usually with an intercostals drain to allow complete expansion of the underlying lungand bring the visceral and parietal pleura into apposition before introduction of a sclerosing agent.

A large number of sclerosing agents have been used intrapleurally to control malignant pleural effusions.[2] These can be divided into two main groups namely sclerosants and chemotherapeutic agents. The sclerosants act by producing chemical pleuritis with subsequent obliteration of the pleural space. The sclerosant commonly employed is asbestos free talc.[3] Examples of chemotherapeutic agents employed for pleurodesis include cisplatin, thiotepa and 5-fluorouracil.

The method traditionally employed for introduction of the sclerosant in the pleural cavity has been with the use of intercostals chest drains.[4] Since the introduction of Video Assisted Thoracoscopic Surgery (VATS) many researchers and clinicians have opted use of this technique for drainage of the malignant pleural effusion and introduction of the sclerosant.[2]

Purpose of the study

The purpose of this study was to determine the efficacy of Video Assisted Thoracoscopic talc pleurodesis in managing patients with malignant pleural effusions by comparing it with talc slurry through an intercostal chest tube drain.

MATERIALS AND METHODS

Appropriate ethical and technical approval was obtained prior to start of the study.

Study design

This prospective non-randomized clinical trial involved analysis of two groups of patients. Group –I patients underwent Video Assisted Thoracoscopic talc pleurodesis whereas group – II patients were subjected to pleurodesis via talc slurry through an intercostals chest tube drain.

Place and duration of study

This study was conducted at the Department of Thoracic Surgery and Department of Oncology Combined Military Hospital, Rawalpindi from October 2008 till November 2010.

Patient selection and grouping

Purposive sampling technique was employed to include fifty patients with histologically proven malignant pleural effusions. Following patients were excluded from the study:

α. Patients who refused consent to undergo the treatment options offered or who refused consent to be included in the study.
β. Patients with extremely poor general condition and very limited life expectancy.
χ. Patients with inadequate pulmonary function (FEV1 less than 0.5L).
δ. Patients with bilateral effusions.
ε. Patients with 'trapped lungs'.

Ten of the selected patients specifically refused consent to general anesthesia and therefore had to be placed in group –II. The remaining forty patients were assigned to groups I and II using the random number table. First patient was assigned to group – I the second to group – II and so on. Group – I included twenty patients whereas group – II included thirty patients.

Interventions

After thorough physical examination, relevant investigations, a written informed consent and pre anesthesia assessment patients in group – I underwent Video Assisted Thoracoscopic talc pleurodesis under general anesthesia. A standard technique was used and all procedures were performed by the same consultant surgeon. 5 grams of talc was used for a single patient. After a similar routine of physical examination, investigations and written informed consent patients in group – II underwent talc slurry through an intercostal chest drainage tube. All procedures were performed using a standard technique and under the supervision of a single consultant oncologist.

Patient follow – up

Post intervention the patients were followed up at monthly intervals to detect recurrence of effusion. Patients who did not develop recurrence for three months were considered to have satisfactory pleurodesis.

DATA COLLECTION AND ANALYSIS

Data was collected with the help of a form. Data included patient age, gender, duration of procedure, duration of post procedure chest drainage, post procedure hospital stay, complications related to the intervention and development of recurrence. Data analysis was done using SPSS – 17. Chi-square test was applied to evaluate the statistical significance of results.Values less than 0.05 ($p < 0.05$) were considered statistically significant.

RESULTS

Mean age of patients in group – I was 56 years (range 34 – 69 years) whereas that of patients in group – II was 60 years (range 41 – 80 years). The age distribution in the two groups is shown in table-I. Male to female ratio in group – I was 5.6:1 whereas that for group – II was 6.5:1. Mean duration of procedure in group – I was 92 minutes (range 55 – 140 minutes) whereas that for group – II was 134 minutes (range 130 – 140 minutes). In group – I post procedure chest drainage continued for an average of 4.4 days (range 3 – 6 days) whereas in group – II the post procedure drainage continued for an average of 3.7 days (range 2 – 6 days). The hospital stay in the two groups is shown in table-II and showed no significant difference between the two groups ($p = 0.838615$). Twenty five percent of patients in group – I and 23% of patients in group – II developed major complications. The frequency of these complications is shown in table-III. The difference in major complications was not significant ($p = 0.160788$) Recurrence developed in one patient (5%) in group – I during follow up whereas recurrence was seen in nine patients (30%) in group – II. The recurrence rate at three months follow up was significantly lower in the Video assisted thoracoscopic talc pleurodesis group ($p = 0.011655$). The mean follow up period in group – I was 6 months and it group – II it was 6.2 months. The recurrences during follow up are shown in table-IV.

Age Group	GROUP – I		GROUP – II	
	No. of patients	Relative Frequency	No. of PATIENTS	RELATIVE FREQUENCY
0 to 9 years	Nil	-	Nil	-
10 to 19 years	Nil	-	Nil	-
20 to 29 years	Nil	-	Nil	-
30 to 39 years	1	5%	Nil	-
40 to 49 years	3	15%	2	7%
50 to 59 years	9	45%	10	33%
60 to 69 years	7	35%	12	40%
70 to 79 years	Nil	-	5	17%
80 to 89 years	Nil	-	1	3%
90 to 99 years	Nil	-	Nil	-
TOTAL	**20**	**100%**	**30**	**100%**

Table-I. Age distribution of patients in groups I & II.

Patient Number	Group–I Hospital stay (Days)	Group–II Hospital stay (Days)
1	5	6
2	15	6
3	7	11
4	5	5
5	7	9
6	10	9
7	12	13
8	4	7
9	9	5
10	7	8
11	4	4
12	5	6
13	8	6
14	6	6
15	7	13
16	4	8
17	6	4
18	8	5
19	4	5
20	10	10
21	N/A	3
22	N/A	5
23	N/A	7
24	N/A	4
25	N/A	6
26	N/A	7
27	N/A	8
28	N/A	5
29	N/A	4
30	N/A	7

Table-II. Length of post procedure hospital stay in groups I & II.

Mean post procedure hospital stay in Group – I: 7.2 days (Standard deviation 2.9)
Mean post procedure hospital stay in Group – II: 6.7 days (Standard deviation 2.5)

DISCUSSION

Definitive palliation of malignant pleural effusion requires institution of a procedure that produces reliable and prolonged pleurodesis with minimum morbidity in these fragile patients. This study has compared two commonly used methods for creating pleurodesis in an attempt to improve the symptoms of patients with malignant pleural effusions. Talc slurry via placement of an intercostal drain has been widely supported as the preferred

Compli cation	Group–I		Group–II	
	No. of patients	%age	No. of patients	%age
Death	Nil	0	Nil	0
Fever	3	15	5	17
Empyema	1	5	1	3
Pulmonary infection	Nil	0	1	3
Malignant invasion of scar	1	5	Nil	0
Total	**5**	**25%**	**7**	**23%**

Table-III. Frequency of complications in groups I & II.

Post Procedure Duration (Months)	GROUP – I		GROUP – II	
	No. of patients with recurrence	%age	No. of patients with recurrence	%age
1	1	5%	7	23%
2	0	0	1	3.5%
3	0	0	1	3.5%
TOTAL	**1**	**5%**	**9**	**30%**

Table-IV. Frequency of recurrence of effusions in groups I & II.

method[5] whereas certain authors have strongly disputed this method owing to high incidence of recurrent effusions and requirements of multiple procedures.[6] The advent of videoassisted thoracoscopy prompted researchers to explore its use in managing malignant pleural effusions with excellent reported initial results.[7] The wide variation in views regarding the preferred method reflects the criteria used to define what is 'best' for the patient. Use of intercostal drains have been promoted with the advantages of being inexpensive, less invasive, easily repeated and not requiring the use of general anesthesia whereas the major drawbacks of videoassisted thoracoscopic procedures has been higher costs, requirement of general anesthesia and training of the surgeons performing the procedure. From the patients perspective arguably the most important criterion would be the ability of the procedure to produce a reliable and prolonged pleurodesis which should obviate the use of

multiple procedures. This study supports the view that videoassisted thoracoscopic pleurodesis is superior to pleurodesis produced by placement of intercostal drain primarily in the domains of achievement of satisfactory pleurodesis and reduced recurrences. The higher percentage (95%) of satisfactory peurodesis achieved in the video-assisted thoracoscopy group is explained by the ability of this procedure to completely drain the malignant effusions by evacuating trapped, loculated and organized fluid under direct vision.

CONCLUSION

Videoassisted thoracoscopic talc pleurodesis is a safe and effective method of producing reliable pleurodesis in patients with malignant pleural effusion. It is superior to pleurodesis via talc slurry through an intercostal drainage tube in terms of completeness of pleurodesis and reduced recurrences. It should be performed early in patients presenting with malignant pleural effusions to avoid the risk of respiratory failure, this being directly linked to the general and respiratory status of the patients at the time of the procedure.

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"Face the reality with courage."

Shuja Tahir

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Muhammad Imran Hameed Daula	Perception, study design, data collection & analysis, manuscript writing