

Managing Malignant Pleural Effusion by Using Video Assisted Thoracoscopy and Tunneled Pleural Catheter

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Abstract

Objective: To study malignant pleural effusion talc pleurodesis by video assisted thoracoscopy (VATS) and tunneled pleural catheter (TPC) in patients with malignant pleural effusion.

Materials and Methods: A retrospective study was performed at a public and private sector hospitals in Rawalpindi from June 2012 to June 2015. Selected patient's data were included length of stay (LOS) in days, post procedure LOS, re-intervention and in hospital mortality and complications. Written and informed consent were taken from each patient. All patients in the VATS talc group had re expansion of the lung at surgery. Four grams of talc were insufflated into the chest under direct VATS observation which is performed with one lung ventilation. A chest tube was placed until drainage dropped below 200 ml per day. The TPCs were either placed percutaneously using sedation or at the time of VATS when the lung did not re-expand a TPC was placed and talc pleurodesis was done.

Results: The total number of cases were 280. Patients were included for VATS with pleurodesis were 110 and 170 went through TPC placement and talc Pleurodesis for MPE. The post procedure LOS was 4 days in TPC and 8 in VATS. Four (2.3%) patients faced re-intervention in TPC and in VATS 18 (16.3%) underwent re-intervention. As far as in-hospital mortality is concerned, TPC has 8 (4%) and 9 (10%) in VATS procedure.

Conclusion: The surgical procedures used in the palliative management of MPE included VATS talc pleurodesis and TPC placement. These procedures are individualized depending upon the patient performance status, prognosis and condition of underlying lung.

Key words: Malignant pleural effusion, Pleurodesis, Tunneled pleural catheter (TPC).

Introduction

Malignant pleural effusion (MPE) is an end-stage manifestation of many cancers.¹ Patients of MPE have a median survival of 4 to 6 months.^{2,3} Because MPE is associated with advanced malignancy, treatment is focused on palliating symptoms rather than cure. MPE signifies incurable disease with considerable morbidity and mortality. The patients with MPE have a dismal mean survival of approximately 6 months with an exception of breast cancer associated MPE.⁴ The ideal palliative procedure has a short length of stay (LOS), minimal future requirements for interaction with the medical system, good efficacy, and minimal post-procedure pain or complications.^{5,6} Several options exist for the treatment of MPE. The most common strategies are thoracentesis, pleurodesis, and placement of a tunneled pleural catheter (TPC).^{7,8} The minimally invasive nature of the TPC allows it to be placed for palliation in a wide range of patients with varying performance status, and a TPC does not require lung expansion to achieve palliation.¹⁸

Pleurodesis may be attempted for recurrent symptomatic pleural effusions, either through a thoracostomy tube or during VATS. Although it is an invasive and painful procedure, associated with hospital stay and morbidity. Pleurodesis is dependent with lung expansion.¹⁹ In those cases where lung itself does not re-expand due to involvement with malignancy, than TPC can be used in these cases and this can be managed by the patient and also

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Received: Jan 6th 2016; Accepted: May 11th 2016

his/her caregiver decreasing their hospital stay and related complications.

We conducted this study to see malignant pleural effusion talc pleurodesis by video assisted thoracoscopy (VATS) and tunnelled pleural catheter (TPC) in patients with malignant pleural effusion depending upon the condition of the patients. The study was conducted because in patients with malignant pleural effusion talc pleurodesis is successful as palliative procedure.

Materials and Methods

This cross-sectional study was conducted at a public and private sector hospitals in Rawalpindi from June 2012 to June 2015. The total number of cases observed was 280. Patients included for VATS with Pleurodesis were 110, and those who went through TPC placement and chemical Pleurodesis, for malignant pleural effusion were 170. Selected patient's data were reviewed to confirm the diagnosis of MPE and data included length of stay (LOS) in days, post procedure LOS, re-intervention and in hospital mortality and complications. Written and informed consent were taken from each patient. Study was approved by the ethical committee. All patients of any age and sex with the diagnosis of malignant pleural effusion were included in this study. Patients with chronic empyema, trapped lungs and effusions other than MPE were excluded from the study.

All patients in the VATS talc group had re expansion of the lung at surgery. They were those patients whose were considered fit enough to tolerate anaesthesia by the anesthetist. Four grams of aerosolized talc were insufflated into the chest under direct VATS observation which is performed under general anaesthesia with one lung ventilation. After VATS talc Pleurodesis, a chest tube was placed and then maintained on water seal until drainage dropped below 200 ml per day. Patients were normally discharged on the same day and their chest tube was removed. Chest radiographs were obtained in the recovery room daily while the chest tube was in place, and after chest tube removal.

The TPCs were either placed percutaneously using conscious sedation or at the time of VATS if VATS talc was planned and the lung did not reexpand at the time of surgery, Pleurodesis was not performed, and a TPC was placed instead. After TPC placement talc slurry pleurodesis was done and patients and their caregivers are taught to drain the TPC in hands on session. Catheters were then drained on a schedule that is individualized for each patient. The data was entered on SPSS 19 for analysis.

Results

Among total of 280 patients, 170 went through tunnelled pleural catheter and talc pleurodesis and 110 went through video-assisted thoracic surgery and talc Pleurodesis in the management of malignant pleural effusion (Figure 1). The variables included length of stay, post procedure LOS in

days, intervention, in hospital mortality and complications. The patients under went TPC showed mean of 9 days as compared to VATS which was 12 days. The post procedure LOS was 4 days in TPC and 8 in VATS. Four (2.3%) patients faced re-intervention in TPC and 18 (16.3%) underwent re-intervention in VATS.

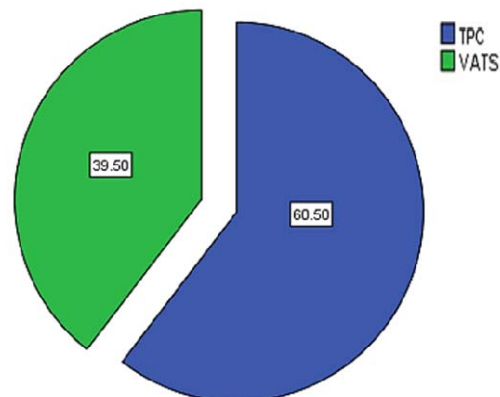


Figure 1: Types of procedures used in management of malignant pleural effusion.

The post procedural complications were not significantly different in both the procedures. The complications included acute respiratory distress syndrome, hypoxia requiring oxygen, intraoperative bleeding, and atrial fibrillation. As far as in hospital mortality is concerned, TPC had 8 (4%) and 9 (10%) mortality in VATS procedure (Table 1).

Discussion

Malignant pleural effusions (MPEs) are an important complication for patients with intrathoracic and extra thoracic malignancies. Median survival after diagnosis of an MPE is 4 months. Patients can present with an MPE as a complication of far-advanced cancer or as the initial

Variables	TPC Talc (n=170)	VATS Talc (n =110)
LOS , days	9(5.2%)	12(10.9%)
Post procedure LOS	4(2.35%)	8(7.27%)
Reintervention	4(2.35%)	18(16.36%)
In hospital mortality	8(4.70%)	9(8.18%)

manifestation of an underlying malignancy.⁹ Most published guidelines for management of MPE begin with a recommendation for thoracentesis, which provides diagnostic and therapeutic value.^{1,7,9,10} If effusion recurs, a definitive palliative strategy should be considered. As in our study we did Pleurodesis with VATS and TPC according to the condition of the patient and underlying malignancy. The results of our study showed LOS in patients treated with total VATS talc Pleurodesis was 12 days (10.9%) and post procedural LOS was 8 days (7.27%) whereas for those

patients who underwent TPC showed LOS was 9 days (5.2%) and post procedure LOS was 4 days (2.35%) We used in our patients four grams of aerosolized talc for chemical Pleurodesis in patients with VATS and talc Pleurodesis was done in patients in whom TPC was placed. Chemical pleurodesis is the traditional procedure used to treat recurrent MPE.⁹ The higher Pleurodesis rate after VATS was also seen and Talc was clearly favored over other sclerosants.¹¹ In hospital mortality was 9 (8.18%) in patients with VATS and talc Pleurodesis and 8 (4.70%), in patients in with TPC and pleurodesis. The causes of mortality were acute respiratory distress syndrome (ARDS) and atrial fibrillation. Pulmonary complications with talc pleurodesis have been reported including the development of acute respiratory distress syndrome.¹²

Re-intervention was done in 18 (16.36%) in VATS group and in 4 patients (2.35%) due to presence of fluid recurrence and pleurodesis was again done in these patients. Various approaches have been tried to mitigate the morbidity of pleurodesis but it still requires a hospital stay, is a painful procedure, and is not useful unless the lung fully re-expand when the effusion is drained.^{13,14} The disadvantages of Pleurodesis relate to pain and the requirement for hospitalization.² The results of our study are comparable to those reported by Hunt et al Murthy and Rice.^{15,16,17}

In our study we have used TPC in 60.5 %. The TPC was approved by the Food and Drug Administration for managing recurrent MPE in 1997 and TPCs are increasingly used for this indication. They are the preferred palliative method for patients with lung entrapment.^{18,19} We did 39.50% VATS pleurodesis in our study for patients with longer life expectancy and better performance status, VATS Pleurodesis with full lung expansion was done.

Conclusion

The surgical procedures used in the palliative management of malignant pleural effusion included VATS talc pleurodesis and tunneled pleural catheter (TPC) placement. For a frail, end-stage population, TPCs afforded better palliation than VATS talc. Combination approaches to treatment of MPE should be investigated in the hopes of further improving our treatment options for these patients.

Conflict of Interest

This study has no conflict of interest as declared by any author.

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