Talc Pleurodesis as Surgical Palliation of Patients with Malignant Pleural Effusion. Analysis of Factors Affecting Survival*

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Abstract. *Malignant pleural effusion (MPE) is common in most patients with advanced cancer, especially in those with lung cancer, metastatic breast carcinoma and lymphoma. This complication usually leads patients to suffer from significant dyspnea, which may impair their mobility and reduce their quality of life. In patients with MPE, several interventions have been shown to be useful for palliation of the symptoms, including talc pleurodesis. The aim of this study was to evaluate prognostic factors for survival of patients with symptomatic MPE who underwent palliative video-assisted thoracoscopic (VATS) talc pleurodesis. Thirty-five patients with MPE underwent VATS, evacuation of the pleural fluid and talc pleurodesis with large-particle talc. There were 22 (62.9%) males and 13 (37.1%) females, with an overall median age of 69 years (range 42-81 years). The main causes of MPE were non-small cell lung carcinoma, breast or ovarian cancer and malignant pleural mesothelioma. The age did not differ (p=0.88) between men (68.6±11.6 years) and women (68.0±8.7 years). The mean quantity of pleural effusion was 2005.7±1078.9 ml, while the overall survival was 11.2±8.9 months. We did not find any relationship between survival and gender (log-rank test, p=0.53) or underlying malignancy associated with MPE (p=0.89, 0.48 and 0.36 for secondary cancer, lung cancer and mesothelioma, respectively). Similarly, no correlation was found between survival and age of the patients (Cox's regression, p=0.44) or quantity of pleural effusion (p=0.88). Our results show that the prognosis of patients after talc pleurodesis is independent of age, gender, type of malignancy and amount of pleural effusion, thus, suggesting the utility of treating all patients with symptomatic MPE early.*

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Pleural carcinomatosis represents the final pathway in several types of malignancies (1). Migration of tumor cells to the pleura from pulmonary capillaries usually results in invasion and obstruction of the lymphatic network and blood vessels, leading to pleural effusion (2, 3). This complication is common in most patients with advanced cancer, especially in those with lung cancer, metastatic breast carcinoma and lymphoma (4). Malignant pleural effusion (MPE) usually leads patients to suffer from significant dyspnea, which may impair their mobility and reduce their quality of life (5).

In patients with MPE, several interventions have been shown to be useful for palliation of the symptoms, including therapeutic thoracentesis, tunneled pleural catheter (TPC) insertion, video-assisted thoracoscopic (VATS) pleural drainage, and talc or chemical pleurodesis (3, 6, 7). Pleurodesis prevents re-accumulation of the effusion and thereby of symptoms, reducing the need for repeated hospitalization for thoracentesis (8). There is no evidence for an increase in mortality following talc pleurodesis, but the factors affecting survival of treated patients are still unclear (8).

The aim of this study was to evaluate prognostic factors for survival of patients with symptomatic MPE who underwent palliative VATS talc pleurodesis.

Patients and Methods

Study population. Thirty-five patients with MPE underwent VATS, evacuation of the pleural fluid and talc pleurodesis with large-particle (mean size 25 μm) talc. There were 22 (62.9%) males and 13 (37.1%) females, with an overall median age of 69 years (range 42-81 years).

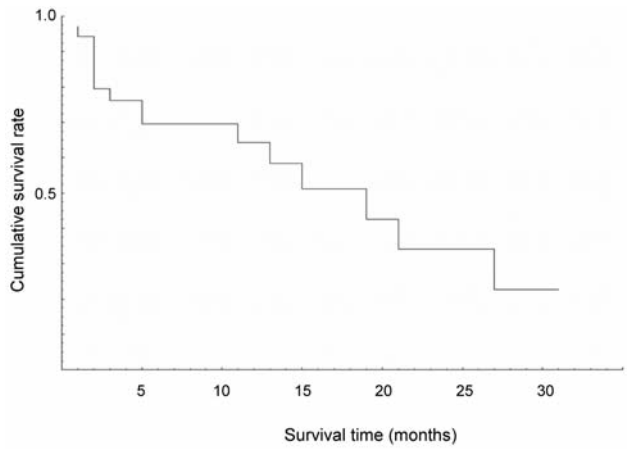

Figure 1. *Kaplan-Meyer survival curve for all patients from the day of palliative talc pleurodesis.*

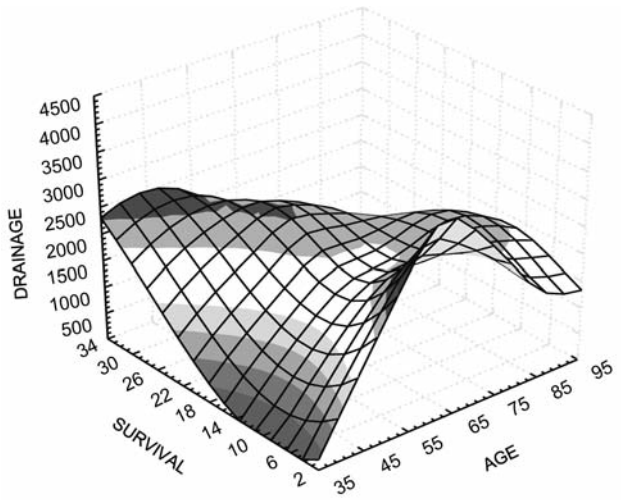

Figure 2. *Relationship between survival (months), age (years) and quantity of pleural effusion (drainage, ml).*

Patients with pulmonary infection, recent myocardial infarction or cardiac failure, clotting disorders, previous pleurodesis, poor performance status (Karnofsky performance index≤30), or life expectancy less than 2 months, were excluded. Written informed consent was received from all participating patients. The main causes of MPE were breast or ovarian cancer, non-small cell lung carcinoma (NSCLC), and malignant pleural mesothelioma in 22 (62.9%), 7 (20.0%) and 4 (11.4%) patients, respectively. Two (5.7%) patients had other malignancies (soft-tissue sarcoma and non-Hodgkin's lymphoma).

Statistical analysis. The reported data are expressed as the mean±standard deviation (SD) and differences between means were tested by the Student's *t*-test. The Kaplan-Meyer method was used to estimate overall survival. The relationship of factors to survival was analyzed using the log-rank test for dichotomous variables (*i.e.* gender and underlying malignancy), while for continuous or ordinal variables (*i.e.* age and quantity of pleural effusion) the Cox regression analysis was performed (1, 6). The differences were considered significant at a p-value <0.01.

Results

The age did not differ (p=0.88) between men (68.6±11.6 years) and women (68.0±8.7 years). Overall, the mean follow-up was 9.8±8.7 months, while the mean quantity of pleural effusion was 2005.7±1078.9 ml. The overall survival was 11.2±8.9 months (Figure 1).

We did not find any relationship between survival and gender (p=0.53) or underlying malignancy associated with MPE (p=0.89, 0.48 and 0.36 for secondary cancer, lung cancer and mesothelioma, respectively). Similarly, no correlation was found between survival and the age of the patients (p=0.44) or the quantity of pleural effusion (p=0.88) (Figure 2).

Discussion

MPE is a severe condition, each year affecting more than 150,000 patients in the United States and 40,000 in the United Kingdom, respectively (9, 10). Breast cancer is the most common tumor metastatic to the pleura in women and NSCLC in men, together accounting for 60-65% of all malignant effusions (3, 11, 12). Indeed, complications such as MPE are not infrequent, leading to a significant reduction of patient quality of life. Unfortunately, the prognosis for patients' with MPE is usually poor, ranging between 3 and 12 months, and they have thus a need for effective management of their respiratory symptoms (5).

Choices to treat MPE include placement of a chest tube for drainage, with or without pleurodesis, or an indwelling pleural catheter (IPC) and VATS pleural drainage, followed by chemical pneumodesis, while in patients with a very short life expectancy only repeat pleural aspiration is recommended (10, 13, 14). In any case, palliative management of MPE involves treatment of the two major symptoms, such as chest pain and dyspnea, which most often result from a combination of pleural fluid accumulation and encasement of the lung from a growing tumor (15). The rate of palliation by IPC and VATS pleurodesis is equivalent, but IPC is considered less invasive (16, 17). However, a recent study undertaken to determine whether IPCs were more effective than chest tube and talc pleurodesis found no significant difference in relieving dyspnea (14). Moreover, systematic reviews evaluating the efficacy and safety of IPC reported symptomatic improvement in more than 90% of patients, but for those with MPE, this treatment was roughly comparable with talc pleurodesis (5, 18).

A number of sclerosing agents for pleurodesis are available to palliate symptomatic MPE, including paclitaxel, cisplatin, doxycycline, erythromycin, iodopovidone and talc (19-25). The ideal agent for pleurodesis remains controversial, but talc is the most common sclerosant used (9, 26). Although concerns remain about the side effect profile of talc pleurodesis, such as pneumonitis, acute respiratory failure, or hypoxemia, the use of talc does not increase mortality and tends to be associated with fewer recurrences when compared to other agents, such as bleomycin and tetracycline, especially using calibrated talc particles (8, 9, 24, 27).

Conclusion

In patients with MPE, talc should be considered the agent of choice in performing pleurodesis, although the use of alternative agents continues to be explored (28). Unfortunately, pleurodesis reduces respiratory symptoms, but does not alleviate impairments in the patient's general condition (25). Our results show that the prognosis is independent of age, gender, type of malignancy and amount of pleural effusion, thus suggesting the utility of treating all patients with symptomatic MPE early.

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