Abstract. Malignant pleural effusion (MPE) is a common, debilitating complication of several types of advanced malignancy, which may significantly reduce the quality of life of patients. There are several options to treat MPE, including thoracentesis, placement of a long-term indwelling pleural catheter and chemical pleurodesis. The best treatment is still debated, but talc remains the agent of choice to achieve pleurodesis. Forty-six patients (28 men and 18 women; median age 67 years, range 47-82 years) with MPE related to different malignancies underwent video-assisted thoracoscopy talc pleurodesis. There were 26 (56.5%) patients with non-small cell lung cancer, 8 (17.4%) with breast cancer, 7 (15.2%) with pleural mesothelioma and 5 (10.9%) with other malignancies. The average operative time was 28±8 minutes, and the duration of chest tube drainage was 9.4±4.1 days. Side-effects were mild (temporary pain, fever for 2-3 days), affecting only three (12%) patients. Two patients (8%) died during hospitalization, due to progression of disease. Overall, pre- and postoperative Karnofsky performance index (KI) and Medical Research Council (MRC) dyspnea score were 62.1±12.2 vs. 71.3±13.2 (p=0.014), and 4.2±0.8 vs. 2.7±1.0 (p<0.001), respectively. A significant relationship between total amount of preoperative pleural effusion and both KI (R=−0.54, p=0.002) and MRC (R=0.64, p=0.0001) was found. No correlation (p=NS, log-rank test) was found between preoperative KI or MRC and underlying malignancy related to MPE. In conclusion, thoracoscopic large-particle talc pleurodesis is a feasible and effective treatment for MPE, significantly improving quality of life of patients.

Improved Quality of Life in Patients with Malignant Pleural Effusion Following Videoassisted Thoracoscopic Talc Pleurodesis. Preliminary Results*

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Patients and Methods

Study population. Forty-six patients (median age 67 years, range 47-82 years) with MPE related to different malignancies underwent video-assisted thoracoscopy (VATS) and pleurodesis with large-particle (mean size 25 μm) talc (Steritalc, Novatech, France), administered by a pneumatic atomizer. There were 26 (56.5%) patients with lung cancer, 8 (17.4%) with breast cancer, 7 (15.2%) with pleural mesothelioma and 5 (10.9%) with other malignancies (Table I). Patients with pulmonary infection, unstable respiratory status, cardiac failure, trapped lung syndrome and poor performance...
status (KI≤30) were excluded from the study. All participants gave written informed consent for participation in accordance with local Ethical Committee guidelines. Patients were asked to report their functional limitations by filling the MRC and KI questionnaires before surgery and at discharge. VATS was performed under general anesthesia, with careful aspiration of pleural effusion and division of adhesions. A chest tube was inserted after thoracoscopy and removed when the daily output was less than 50 ml. The amount of pleural effusion was measured and recorded in a database, together with pre- and postoperative KI and MRC score, age of the patients and duration of chest tube drainage.

Statistical analysis. The reported data are expressed as the mean±standard deviation (SD). Differences between means were tested by Student’s t-test, while the relationship between pairs of variables was determined using Pearson’s correlation coefficient (R) calculation and the log-rank test for dichotomous variables. Each association was considered statistically significant when the p-value was <0.01.

Results

The average duration of VATS was 28±8 minutes, and the duration of chest tube drainage was 9.4±4.1 days. Side-effects were mild: temporary local pain, fever for 2-3 days and cellulitis. Three patients (6.5%) died during hospitalization due to progression of disease.

Overall, the pre- and postoperative KI and MRC score were 62.1±12.2 vs. 71.3±13.2 (p=0.014), and 4.2±0.8 vs. 2.7±1.0 (p<0.001), respectively. Table II reports the correlation found between parameters. A significant relationship between the total amount of preoperative pleural effusion and both KI (R=−0.54, p=0.002) and MRC (R=0.64, p=0.0001) was found (Figure 1). No correlation (p=NS, log-rank test) was found between pre- and postoperative KI or MRC scores and the underlying malignancy related to MPE.

Discussion

Pleural effusion is a common, debilitating complication of several types of advanced malignancy. The presence of MPE indicates a poor prognosis, with a median survival of patients ranging from 3 to 12 months (1, 9). MPE is more frequently associated with lung cancer and advancer breast carcinoma, followed by ovarian cancer, lymphomas and other malignancies (10). Usually, dyspnea and cough greatly affect the QoL of patients with MPE. Thus, relief of symptoms and prevention of pleural effusion reaccumulation represent the main goal of treatment. Thoracentesis is the essential first step, but is associated with recurrence in at least 90% of patients within 30 days from the procedure (11). Chest tube drainage, pleurodesis by either VATS or thoracostomy with talc slurry, and intrapleural chemotherapy are the commonest therapeutic options for treating MPE (12).

Obliteration of the pleural cavity can be achieved through extensive adhesion of the visceral and parietal pleura, induced by several sclerosing agents (13). Talc remains the agent of choice to obtain pleurodesis and is currently recommended by the British Thoracic Society (BTS) 2010 guidelines (14). Talc, magnesium silicate ([Mg₃Si₄]₁₀[OH]₂), has been used for pleurodesis in the treatment of many pleural diseases, such as benign and malignant pleural effusion and spontaneous pneumothorax, since the first half of the 20th century (6, 15, 16). The use of large-particle talc

![Figure 1. Relationship between amount of pleural drainage (ml), preoperative Medical Research Council (MRC) dyspnea score and Karnofsky performance index.](image)

Table I. Main characteristics of the study population.

<table>
<thead>
<tr>
<th>Primary tumor</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-small cell lung cancer</td>
<td>21 (75.0%)</td>
<td>5 (27.8%)</td>
</tr>
<tr>
<td>Breast carcinoma</td>
<td>None</td>
<td>8 (44.4%)</td>
</tr>
<tr>
<td>Pleural mesothelioma</td>
<td>5 (17.9%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>Other malignancy</td>
<td>2 (7.1%)</td>
<td>3 (16.7%)</td>
</tr>
<tr>
<td>Overall</td>
<td>28 (60.9%)</td>
<td>18 (39.1%)</td>
</tr>
</tbody>
</table>
is usually considered safe and BTS guidelines suggest talc pleurodesis as the first-line treatment for patients with symptomatic MPE, having limited side-effects (14). Several studies confirmed its higher success rate and a lower complication rate as compared to other techniques (5, 6, 11). The use of IPC should be reserved for patients with trapped lung or unsuccessful talc pleurodesis (14). However, the heterogeneity among patients with MPE makes the adoption of a single approach difficult (17).

In the decision-making process, the impact of MPE on QoL, type and stage of the underlying cancer, performance status and patient preferences should be considered (18). In a multicentric study comparing talc poudrage vs. talc slurry, both methods of talc delivery obtained similar outcomes (78% vs. 71%, p=NS), without any significant benefit of one technique over the other (19). Thoracoscopic talc poudrage is a painless procedure and has the advantage of complete evacuation of the cavity, allowing pleural adhesions to resolve and lung or pleural biopsies to be performed, if needed. However, in patient selection, the risk of single-lung ventilation should be considered.

The reported short-term (1-3 months) and 6-month success rate of VATS talc insufflation ranges from 85% to 89% and from 82% to 83%, respectively (11, 20). Successful pleurodesis is clearly related to a marked improvement in dyspnea. In our series, both KI and MRC scores improved significantly (p<0.01) after the procedure and were related to the amount of preoperative pleural effusion. More recently, Davies et al. (21) did not find any significant difference in visual analog scale dyspnea scores between first-line talc pleurodesis and IPC, in the management of MPE. IPC was associated with several adverse events, but did reduce the length of hospitalization (21).

In conclusion, our preliminary data confirm that VATS talc pleurodesis is a feasible and effective treatment for MPE, impacting favorably on the QoL of patients with MPE, and representing the method of choice for improving dyspnea and chest pain, which are the principal goals of care for such patients. The relationship between total pre-operative pleural effusion and QoL is somewhat obvious, but interesting, thus suggesting the advantages of early treatment of MPE in the majority of such patients.

### References