

Thoracoscopic chemically induced pleurodesis in the treatment of malignant pleural effusion as a model of general and local inflammatory reaction

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Summary

Continuous formation of malignant pleural effusions causes metabolic and mineral disruption. Large effusions gradually compress the lung parenchyma. The result is an increasing shortness of breath. Prolonged compression of pulmonary parenchyma also causes atelectasis which may then cause an inflammatory process of the lung parenchyma. An effective method of palliative treatment is a chemical pleurodesis, which is used in selected patients as a second line of palliative cancer treatment. The principle is to eliminate the space between the visceral and parietal sheets of pleura by inducing aseptic inflammation. The most effective way of application of chemicals is via videothoracoscopy. The advantage is the possibility of drainage of pleural cavity and application of talc powder. Pleurodesis has been used for many years, but there is a lack of objective assessment of the overall and local inflammatory reactions, by which the body responds to foreign substances.

In a group of 47 patients who were treated at our department in the period between January 2009 and December 2010, 29 (61.7%) were men and 18 (38.3%) were women with a cytologically proven recurrent malignant pleural effusion of different etiology. The age ranged between 42 to 80 with average age of 65 years. This group has been retrospectively divided into a subgroup (A) without recurrence of effusion and a subgroup (B) with the need of further intervention such as pleural effusion puncture or drainage in a nine month monitoring period.

The aim was to assess the course of local and systemic inflammatory changes that take place in the body and in the pleural cavity after talc application. The increase of inflammatory markers such as CRP, leukocytes, body temperature was more obvious in group A than in group B. It can be concluded that in group A the immune system was better prepared against external noxious substances than in group B.

Monitored local parameters showed significant changes. Some parameters showed similar trend of change regardless of the group and whether it was a group with a successful or failing treatment. Immediately after talc application a significant decline in lymphocytes and an increase in granulocytes was noted in the pleural effusion.

The original findings were noted during the evaluation of soluble forms of cellular receptors. The group of patients with good prognosis showed statistically significant higher levels of anti-inflammatory forms of soluble CD-163 in the pleural fluid before talc placement. This shows the difference in reactivity of inflammatory response to external impulses. The group of patients with unfavourable prognosis showed lower levels of soluble forms of TLR - 2 immediately after talc application. This shows the low local reactivity to external impulse.

The effect of treatment was not influenced by the basic type of cancer. In both groups there was no significant difference in postoperative complications. This proves the safety of the selected procedure and also supports the correctness of the chosen algorithm of treatment.

It was impossible to demonstrate the relationship between the amount of pleural effusion and the severity of shortness of breath, which can confirm the fact that dyspnea is a subjective symptom of the disease.

