Is video-assisted thoracoscopic surgery talc pleurodesis superior to talc pleurodesis via tube thoracostomy in patients with secondary spontaneous pneumothorax?

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Abstract

A best evidence topic in thoracic surgery was written according to a structured protocol. The question addressed was [in patients with secondary spontaneous pneumothorax (SSP)] is [video-assisted thoracoscopic surgery (VATS) talc pleurodesis] superior to [talc pleurodesis through tube thoracostomy] in terms of [absence of recurrence and procedure morbidity]? Seventy-three papers were found using the reported search. In looking through our search strategy, we selected studies comparing both procedures and studies performing either procedures and stating their outcome, morbidity mortality and rate of recurrence. Hence, six studies and one society guideline represented the best evidence to answer the clinical question. The authors, journal, date, patient group studied, study type, relevant outcomes and results of these papers are tabulated. Only one study compared both techniques and showed a higher length of hospital stay (14.2 vs 10.6 days; \( P = 0.033 \)), higher rate of recurrence (30 vs 4.5%; \( P = 0.016 \)) and higher mortality (5 vs 0%; \( P = 0.280 \)) with tube thoracostomy talc pleurodesis in comparison with video-assisted thoracoscopic surgery (VATS) talc pleurodesis. Two studies looked at talc pleurodesis via tube thoracostomy (TT) alone for patients with secondary spontaneous pneumothorax (SSP). Talc pleurodesis was associated with immediate success rate of 78.1 and 78.6%, short-term recurrence rate of 21.9 and 21.4%. No mortality was recorded in any study, but 1 patient (1.6%) in one study suffered from respiratory distress. No long follow-up periods were available in both studies; hence, there is no recording of long-term recurrence. Three studies looked at VATS talc pleurodesis alone in SSP patients. The procedure was associated with higher immediate success rates (90–100%) than TT pleurodesis alone with lower recurrence rates (0–10%). Average hospital stay was in the range of 3–4.7 days. Follow-up periods were 18, 22.7 and 24 months with recurrence rate ranging from 0 to 15%. No study was associated with major postoperative morbidity or in-hospital mortality. In conclusion, while there is only one study directly comparing both VATS and tube thoracostomy talc pleurodesis, the best evidence suggests that VATS talc pleurodesis for patients with secondary pneumothorax should be considered the treatment of choice as it is associated with a higher immediate success rate, lower recurrence rate and a lower mortality than talc pleurodesis via tube thoracostomy.

Keywords: Secondary pneumothorax • Pleurodesis

INTRODUCTION

A best evidence topic was constructed according to a structured protocol. This is fully described in the ICVTS [1].

THREE-PART QUESTION

In [patients with secondary spontaneous pneumothorax] is [video-assisted thoracoscopic surgery (VATS) talc pleurodesis] superior to [talc pleurodesis through tube thoracostomy] in terms of [absence of recurrence and procedure morbidity]?

CLINICAL SCENARIO

A 64-year old patient with chronic obstructive pulmonary disease (COPD) presents with a second attack of secondary spontaneous pneumothorax (SSP). He has a persistent air leak for 5 days. You plan to schedule him for a VATS talc pleurodesis. The patient asks you if he can be treated with talc pleurodesis through his tube thoracostomy (TT). You decide to look at the evidence on the topic to assess if one procedure is superior to the other.

SEARCH STRATEGY

A Medline search from 1949 to February 2016 was performed using (secondary spontaneous pneumothorax) AND (talc) AND (VATS OR thoracic surgery OR tube thoracostomy OR pleurodesis).

SEARCH OUTCOME

Seventy-three papers were found using the reported search. From these, six papers and one society guideline were identified that provided the best evidence to answer the question. These are presented in Table 1.
The study by Kim et al. [2] was the only study in our search comparing TT talc pleurodesis (n = 39 patients) and VATS talc pleurodesis (n = 22 patients) for SSP in the same study. The mean hospital stay in the TT group was 14.2 vs 10.6 days in the VATS group (P = 0.033). Follow-up period was up to 35 months. Recurrence rate for the TT pleurodesis group was significantly higher (12/39, 30%) compared with that of the VATS group (1/22, 4.5%; P = 0.016). Morbidity was absent in both groups, but 2 patients (5%) died in the TT talc pleurodesis group versus none in the VATS group (P = 0.280). The authors concluded that thoracoscopic
surgery with talc pleurodesis results in shorter hospital stay and lower recurrence rate in comparison with TT talc pleurodesis.

Aihara et al. [3] studied the efficacy and safety of blood and TT talc pleurodesis for SSP in 34 patients with interstitial lung disease. Air leakage ceased in 16 of 22 (72.7%) episodes after blood pleurodesis and in 11 of 14 (78.6%) episodes after talc pleurodesis. No harmful events were associated with either procedures, but the median survival after an attack of pneumothorax was 9 months; hence, no long-term follow-up period was available.

Ng et al. [4] conducted a retrospective analysis on SSP patients who underwent minocycline pleurodesis (n = 121) versus talc slurry (n = 64). Both groups had a comparable sclerosing efficacy in SSP, with immediate success rates of 71.9 and 78.1%, respectively (P = 0.31). Pain was experienced in 44.6 and 37.5%, respectively, with more common in patients receiving high doses of talc (≥5 g; P = 0.03). Respiratory distress was found in 1.7 and 1.6%, respectively. There was no long-term follow-up recorded. The authors concluded that both agents appeared to be effective and safe for chemical pleurodesis in SSP, but were associated with a slightly high failure rate.

Aiwade et al. [5] treated 20 SSP out of 21 spontaneous pneumothorax patients by VATS talc pleurodesis over a 2-year period. Immediate success was observed in 18 of 20 patients (90%). The mean postoperative hospital stay was 3 ± 3.2 days. There was no associated significant morbidity or in-hospital mortality. Follow-up period was 24 months. Pneumothorax recurred in 3/20 (15%) of patients during the follow-up period and all were treated successfully by repeated VATS talcage. The authors concluded that the study confirms the short-term and medium-term effectiveness of VATS talc pleurodesis.

Pletinkx et al. [6] reported 5 SSP patients out of 20 pneumothorax patients who underwent VATS talc pleurodesis over a 5-year period. Immediate success of talcage was 100%. There were no major complications or in-hospital mortality. The mean follow-up period was 22.7 months. No cases of recurrence were recorded during this follow-up period. The authors concluded that thoracoscopic talc pleurodesis was safe and efficient in their experience.

Noppen et al. [7] studied 20 patients with SSP who had a VATS talc pleurodesis over a 25-month period. Prolonged air leak was observed in 26% of patients, but all air leaks ceased during the hospital stay period. The median hospital stay was 4.7 (±2) days. No major postoperative complications or in-hospital mortality was recorded. The recurrence rate was 8.7% during a mean follow-up period of 18 months. The authors concluded that thoracoscopic talcage is efficient and safe in achieving pleurodesis in persistent spontaneous pneumothorax.

The BTS guidelines in 2010 [8] for the management of spontaneous pneumothorax suggest that chemical pleurodesis via TT for recurrent spontaneous pneumothorax should be reserved for frail patients if it is associated with a higher recurrence rate when compared with VATS pleurodesis although there are no available comparative studies.

**CLINICAL BOTTOM LINE**

In conclusion, while there is only one study directly comparing both VATS and TT talc pleurodesis, the best evidence suggests that VATS talc pleurodesis for patients with SSP should be considered for the treatment of choice as it is associated with a higher immediate success rate, lower recurrence rate and a lower mortality than talc pleurodesis via TT.

**Conflict of interest:** none declared.

**REFERENCES**


**eComment. The ways to increase the effectiveness of pleurodesis**

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We read the article by Elsayed et al., “Is video-assisted thoracoscopic surgery talc pleurodesis superior to talc pleurodesis via tube thoracostomy in patients with secondary spontaneous pneumothorax?” [1]. We want to express our opinions about the management of secondary spontaneous pneumothorax and provide some observations about treatment outcome.

We agree with the authors about the superiority of video-assisted thoracoscopic surgery (VATS) in talc pleurodesis. When the surgeon exercises great care and patience, he or she can distribute talc particles to every corner of the thoracic cavity and to the lung surface, thereby increasing the effectiveness of the treatment. VATS pleurodesis increases the possibility of adhesions and decreases the chance of recurrence of pneumothorax or pleural effusion. Therefore, we recommend talc pleurodesis for the treatment of persistent pleural effusions. For secondary spontaneous pneumothorax, we advise early surgical treatment with stapling of the leakage and pleurectomy. Without early surgical treatment, the patient could face prolonged air leak or recurrent pneumothorax.

We think that the outcome of talc pleurodesis via tube thoracostomy depends on many factors. These include the position of the tube, the mobility of the patient and the ventilation capacity of the patient. A tube inserted in the fissure or on the diaphragm would not be able to function properly. Talc that is delivered to the thoracic cavity via tube thoracostomy should be reserved for frail patients as it is associated with a higher recurrence rate when compared with VATS pleurodesis although there are no available comparative studies.

**Conflict of interest:** none declared.

**Reference**