

Review: Thoracoscopic pleurodesis with talc may be the optimal technique in patients with malignant pleural effusion

Shaw P, Agarwal R. Pleurodesis for malignant pleural effusions. *Cochrane Database Syst Rev.* 2004;(1):CD002916.

QUESTION

In patients with malignant pleural effusion, what is the optimal technique of pleurodesis?

METHODS

Data sources: Cochrane Controlled Trials Register (Issue 4, 2001), MEDLINE (1980 to June 2002), EMBASE/Excerpta Medica (1980 to May 2002), bibliographies of relevant studies, and contacting experts.

Study selection and assessment: Randomized controlled trials (RCTs) in any language of patients > 16 years of age having pleurodesis for pleural effusion in the context of metastatic cancer or a malignant process leading to pleural effusion that compared any sclerosant with other sclerosants, or thoracoscopic pleurodesis with bedside pleurodesis. 2 reviewers independently assessed studies for quality.

Outcomes: Effectiveness of pleurodesis (non-recurrence of effusion) and adverse events.

MAIN RESULTS

36 RCTs (1499 patients) with sample sizes ranging from 19 to 95 patients met the inclusion criteria. 24 RCTs compared the effectiveness of different sclerosants. Bedside pleurodesis was used in most trials. 8 RCTs compared thoracoscopic pleurodesis with

bedside pleurodesis. In most trials, effectiveness of pleurodesis was based on radiographic evidence of recurrence of effusion or clinical need for repeated thoracocentesis. Meta-analysis of 5 RCTs of bedside pleurodesis showed greater overall effectiveness of sclerosants than thoracostomy tube alone (3 RCTs), isotonic saline (1 RCT), or multivitamin solution (1 RCT) (Table). In 10 RCTs (308 patients), talc was more effective than other sclerosants (bleomycin, tetracycline, mustine, and drainage alone) for pleurodesis (Table). In 4 RCTs (143 patients), *Corynebacterium parvum* was more effective than other sclerosants (bleomycin and tetracycline) for pleurodesis (Table). Overall, no benefits were seen with bleomycin, tetracyclines, mitozantrone, or mepacrine compared

with other sclerosants. In 5 RCTs (145 patients), thoracoscopic instillation of various sclerosants (tetracycline, bleomycin, talc, or mustine) was more effective than bedside instillation (Table). Data on adverse events were inadequate.

CONCLUSIONS

In patients with malignant pleural effusion, sclerosants are effective for pleurodesis. Talc may be the optimal sclerosant, and thoracoscopic pleurodesis may be the optimal technique for pleurodesis.

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Pleurodesis for nonrecurrence of effusion in malignant pleural effusion*

Comparisons	Number of trials (number of patients)	Weighted event rates	RBI (95% CI)	NNT (CI)
Sclerosants vs control†	5 (228)	86% vs 72%	20% (4 to 38)	8 (5 to 50)
Talc vs other sclerosants	10 (308)	81% vs 60%	34% (16 to 55)	5 (4 to 10)
<i>Corynebacterium parvum</i> vs other sclerosants	4 (143)	78% to 60%	30% (2 to 67)	5 (4 to 29)
Thoracoscopic vs bedside instillation	5 (145)	89% vs 53%	68% (35 to 110)	3 (3 to 5)

*Abbreviations defined in Glossary; weighted event rates, RBI, NNT, and CI calculated from data in article using a fixed-effects model.

†Sclerosants were talc, tetracycline, or mitozantrone; control interventions were thoracostomy tube alone, isotonic saline, or multivitamin solution.

COMMENTARY

Patients with malignant pleural effusion have a short life expectancy. A need exists for an optimal sclerosant and method of administration for pleurodesis and palliation. However, these goals remain elusive.

The meta-analysis by Shaw and Agarwal described studies that were poorly controlled, had small patient populations, and provided inadequate description of pleurodesis failure. In addition, adverse events and quality-of-life measures were insufficiently addressed. Such is the state of the studies that are currently available in the literature.

In practice, talc is a superior sclerosant agent. However, the studies described in the review by Shaw and Agarwal did not provide information on the size of the talc particles used. Adverse events from using talc, independent of the procedure, are inversely proportional to particle size. Thus, large talc particles (> 15 microns) should be used to decrease the incidence of the adult respiratory distress syndrome (1).

Pleurodesis may fail for the following reasons: poor placement of the chest tube, poor drug distribution, inability to identify a trapped lung, inability to identify tumor burden, or inadequate drainage of the pleural cavity. Because thoracoscopy can overcome all these factors, it's a good technique for pleurodesis. When thoracoscopy is performed in an operating room setting (e.g., video-assisted thoracic surgery) rather than in a medical setting, the risk associated with general anesthesia increases, and the cost advantage disappears (2).

Recently, a growing interest has emerged in the use of small-bore chest tubes by radiologists for pleurodesis, but this has a high failure rate and has been inadequately studied. Despite this, the popularity of this technique has grown. This type of pleurodesis may fail primarily because of a small lumen providing inadequate drainage of the pleural space. This usually results in partial pleurodesis with multiple locules with a 50% failure rate (3). In the future, studies need to compare small-bore chest tubes with large-bore chest tubes for adequacy of pleurodesis.

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