Online Appendix C6 BTS Guideline for Pleural Disease

Section C Pleural infection

Question C6 Evidence Review and Protocol

C6 For adults with pleural infection, which method of surgery provides the best clinical outcomes?

Contents

Question Evidence Review

C6 For adults with pleural infection, which method of surgery provides the best clinical outcomes?

Background

Different surgical methods can be deployed, which are broadly classified into drainage, debridement and visceral decortication. The aim of this review was to determine which method of surgery provides the best clinical outcomes.

Outcomes

Mortality, need for repeat intervention, quality of life, patient symptoms, length of hospital stay and complications

Evidence review

The initial literature review identified 34 potentially relevant studies, of which two were deemed relevant to the review. These included a retrospective comparative study[1] and a retrospective non-comparative study[2], but the reviewed literature was generally confounded by indication, with decortication selectively deployed in more advanced empyema.

Mortality

Both studies reported on mortality and a summary of the results in shown in Table C6a.

Table C6a: Comparison of mortality rates following surgery with or with decortication for the treatment of pleural infection in adults

	% Mortality rate (no. patients)		
Study	**Decortication**	**No decortication**	***p***
Casali 2009[1]	5% (3/60)	0% (0/44)	NR
Kondov 2017[2]	5% (5/108)	-	-

NR – not reported

Need for repeat intervention and quality of life

Neither study reported on the need for repeat intervention or quality of life.

Patient symptoms

Casali et al reported on long-term post-operative breathlessness following surgery with and without decortication and a summary of the results is shown in Table C6b. The mean follow up time was 82 months (median 62 months, range 19-180).[1]

Table C6b: Comparison of long-term breathlessness following surgery with or with decortication for the treatment of pleural infection in adults

	Breathlessness score*				
	0	**1**	**2**	**3**	**4**
Surgery arm	**% patients** (no. patients)				
With decortication	67% (40/60)	23% (14/60)	0% (0/60)	10% (6/60)	0% (0/60)
Without decortication	45% (20/44)	41% (18/44)	14% (6/44)	0% (0/44)	0% (0/44)

* Modified Medical Research Council (MRC) dyspnoea scale from 0 (no breathlessness, except with strenuous exercise) to 4 (too breathless to leave the house, or breathless when dressing or undressing)

Length of hospital stay

Length of hospital stay following surgery was reported in both studies and the results are summarised in Table C6c.[1,2]

Table C6c: Comparison of length of hospital stay following surgery with or with decortication for the treatment of pleural infection in adults

	Length of hospital stay (mean days)		
	Decortication	No decortication	
Study		**VATS**	**Open thoracotomy**
Casali 2009[1]	14.6	6.4	9.0
Kondov 2017[2]	15.9	-	-

Complications

Casali et al reported on post-operative complications but did not report on the number of complications per experimental arm (surgery with or without decortication). 24% of their total cohort experienced post-operative complications (25/104 participants), which included persistent air leak greater than 5 days (11/104), bleeding (10/104), pneumonia (2/104) and cardiac arrhythmia (2/104).[1]

Evidence statement

Decortication surgery for pleural infection may be associated with a longer post-operative stay and higher mortality than surgery that does not involve decortication, but is associated with less breathlessness (**Ungraded**)

Recommendations

No recommendations can be made based the available evidence.

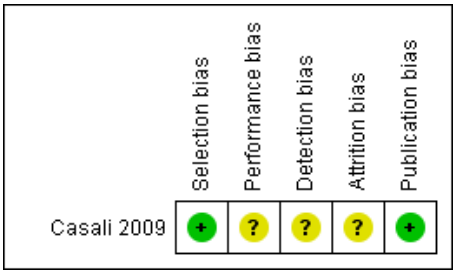
Good Practice Point

- ✓ Extent of surgery should be tailored according to patient and empyema stage when the lung is not completely trapped (drainage versus debridement)
- ✓ Decortication should be a decision that is individualised to the patient with a trapped lung based on assessment of patient fitness and empyema stage

Research Recommendation

- Further research is needed to determine the efficacy of decortication surgery versus either drainage or debridement alone for the management of a trapped lung associated with pleural infection

Risk of bias summary



References

1. Casali C, Storelli ES, Di Prima E, Morandi U. Long-term functional results after surgical treatment of parapneumonic thoracic empyema. *Interact Cardiovasc Thorac Surg.* 2009;9(1):74-78.
2. Kondov G, Spirovski Z, Kondova-Topuzovska I, et al. Surgical treatment of pleural empyema - our results. *Pril (Makedon Akad Nauk Umet Odd Med Nauki).* 2017;38(2):99-105.

Question Protocol

Field	Content
Review Question	For adults with pleural infection, which method of surgery provides the best clinical outcomes?
Type of review question	Intervention review
Objective of the review	To determine the surgical intervention that is best at improving patient outcomes.
Eligibility criteria – population / disease / condition / issue / domain	Adults (18+) with pleural infection undergoing surgery
Eligibility criteria – intervention(s)	Surgery with decortication
Eligibility criteria – comparators(s)	Surgery without decortication Open drainage with or without rib resection
Outcomes and prioritisation	Mortality Need for repeat intervention Quality of life Patient symptoms Length of hospital stay Complications
Eligibility criteria – study design	RCTs Prospective comparative studies Case series of >100 patients
Other inclusion /exclusion criteria	Non-English language excluded unless full English translation Conference abstracts, Cochrane reviews, systematic reviews, reviews Cochrane reviews and systematic reviews can be referenced in the text, but **DO NOT** use in a meta-analysis
Proposed sensitivity / subgroup analysis, or meta-regression	None

Selection process – duplicate screening / selection / analysis	Agreement should be reached between Guideline members who are working on the question. If no agreement can be reached, a decision should be made by the Guideline co-chairs. If there is still no decision, the matter should be brought to the Guideline group and a decision will be made by consensus
Data management (software)	RevMan5 — Pairwise meta-analyses Evidence review/considered judgement. Storing Guideline text, tables, figures, etc. Gradeprofiler — Quality of evidence assessment Gradepro — Recommendations
Information sources – databases and dates	MEDLINE, Embase, PubMED, Central Register of Controlled Trials and Cochrane Database of Systematic Reviews 1966 - present
Methods for assessing bias at outcome / study level	RevMan5 intervention review template and NICE risk of bias checklist (follow instructions in '*BTS Guideline Process Handbook – Intervention Review'*)
Methods for quantitative analysis – combining studies and exploring (in)consistency	If 3 or more relevant studies: RevMan5 for meta-analysis, heterogeneity testing and forest plots (follow instructions in '*BTS Guideline Process Handbook – Intervention Review'*)
Meta-bias assessment – publication bias, selective reporting bias	GRADEprofiler — Intervention review quality of evidence assessment for each outcome (follow instructions in '*BTS Guideline Process Handbook – Intervention Review'*)
Rationale / context – what is known	Some patients with pleural infection don't improve without surgical intervention. If they do need surgery, what should be undertaken?