Surgical Treatment of Empyema

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Resident Discussion

- Introduction to Empyema
- Debate Points
  - VATS and Surgical Treatment
- The Evidence
- The Conclusion
Empyema

- Pus in lung
  - Greek: suppuration
- Triphasic etiology
  - Exudative phase: thin/sterile
  - Transitional/fibrinopurulent phase:
    - Fibrin deposition/pus
  - Consolidative phase:
    - Rigid peel, granulation tissue
The Options

- Drainage
- Catheter based treatments - fibrinolytics
- VATS
- Thoracotomy and Open Decortication
Considerations

- Efficacy - definitive treatment
- Cost, days in hospital, mortality
Video-Assisted Thoracoscopic Decortication for Management of Postpneumonic Pleural Empyema

- VATS debridement and decortication in 70 consecutive patients
- Successful in 65/70
- Authors: VATS should be first line

The Evidence

Surgical versus non-surgical management of pleural empyema (Review)

Coote N, Kay E

• 2005 review
• Objective:
  – Efficacy of open surgery, VATS, and non-surgical drainage
• Searched all literature
Cochrane: Wait 1997

VATS
- treatment success (10/11) 91%
- 5.8 days with chest tube
- 8.7 days in hospital

Streptokinase
- treatment success (4/9) 44%
- 9.8 days with chest tube
- 12.8 days in hospital

Treatment failures from Streptokinase group went on to have thoracoscopy

Cochrane Analysis

- Lim et al: Non-randomized study
- Compared
  - Chest tube alone vs.
  - Chest tube with steptokinase vs.
  - Chest tube/streptokinase and early surgery

Lim et al

• Statistically significant reductions in the length of hospital stay in the early surgical group.
• Mortality rate was significantly lower with early surgery (3% vs. 24% with chest tube alone).
Conclusion of Cochrane Review

“When compared with chest tube drainage combined with strepokinase, VATS had a significantly higher primary treatment success and patients spent less time in hospital”
Review: Current Surgical Treatment of Thoracic Empyema in Adults


Fig. 3. Connection between the stages of thoracic empyema and the best-evidenced methods of choice. The theoretical time-scale is not necessarily identical to the documented duration of the disease of the individual patient. The graphical representation is not intended to be considered as an absolute and exclusive scheme.
Review: Current Surgical Treatment of Thoracic Empyema in Adults

• 1A level evidence did not find enzymatic decortication superior to tube thoracostomy treatment.

• Evidence suggests that following a failed chest tube a VATS evacuation is more beneficial than after fibrinolysis.
A closer look

• Compared 2 groups:
  – 20 pts referred to VATS after fibrinolytic failure
  – 18 treated thoracoscopically immediately

Petrakis et al cont:

- VATS should be treatment of choice in fibrinopurulent stage and is more effective when applied primarily vs after fibrinolytic tx.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>VATS</th>
<th>Fibrinolytics and VATS</th>
<th>P value</th>
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<tbody>
<tr>
<td>Success rate</td>
<td>95%</td>
<td>85%</td>
<td>NS</td>
</tr>
<tr>
<td>Duration of procedure (min)</td>
<td>62 ± 10</td>
<td>70 ± 14</td>
<td>&lt;0.001</td>
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<tr>
<td>Duration of tube staying (days)</td>
<td>3.5</td>
<td>4.5</td>
<td>NS</td>
</tr>
<tr>
<td>Hospital stay (days)</td>
<td>4.5</td>
<td>7.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mortality</td>
<td>0</td>
<td>0</td>
<td>NS</td>
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</tbody>
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VATS = video-assisted thoracoscopic surgery; NS = not significant.
DENVER Experience

- Retrospective analysis of 39 patients with S. milleri infections in the pleural space
- 26 (67%) underwent operative intervention
  - 13 VATS
  - 13 Thoracotomy

DENVER Experience

- Operative group:
  - Shorter hospital stay
  - Greater discharge to home
  - Less mortality

<table>
<thead>
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<th>Table 3</th>
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<td>Comparisons of outcomes in terms of length of stay, mortality, and discharge to home between the operative and nonoperative groups</td>
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<table>
<thead>
<tr>
<th></th>
<th>Length of stay (d)</th>
<th>Mortality</th>
<th>Discharge to home</th>
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</thead>
<tbody>
<tr>
<td>Operative group (n = 26)</td>
<td>24</td>
<td>0</td>
<td>20 (77%)</td>
</tr>
<tr>
<td>Nonoperative group (n = 13)</td>
<td>34</td>
<td>4 (31%)</td>
<td>2 (16%)</td>
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</tbody>
</table>
DENVER Experience

Concerning Fibrinolytics post IR drains:
38% (3/8) of operative group
50% (3/6) of non-op group

- 21% did not require further intervention
ASK YOURSELF

• When faced with the butt pus of CT surgery.....

• You want the most efficacious treatment...from the start
Ask Yourself

• Several authors state:
  – “injudicious use of intrapleural fibrinolytic therapy may contribute to a delay in surgical intervention and thus preclude successful VATS treatment\(^1\)”
  – “VATS showed maximum efficacy when applied immediately after diagnosis\(^7\)”
Conclusions

- early parapneumonic phase: antibiotics may be satisfactory
- pus in pleural space needs drainage
  - surgical intervention supreme over catheter tx.
- thick pleural peel necessitates thoracotomy and usually decortication
References


