Management of post-pneumonic empyema in children

Treatment of paediatric post-pneumonic empyema remains controversial, and many treatment options exist, depending on the stage of the disease. Generally, there are three distinctive stages that represent the evolution of empyema: stage I is the early exudative phase, stage II the fibrinopurulent stage, and stage III represents an organising empyema with loculations. This retrospective study aimed to match disease stages with the most appropriate treatment strategies.

Materials and methods
The study group comprised 515 children (289 males and 226 females; mean age 4.7 years), treated for empyema between 1990 and 2002. Empyema was secondary to pneumonia in all cases.

Results
Pleural effusion was the most common radiological finding, present in 55.3% of patients. Staphylococcus aureus was most frequently found, cultured in 20.4% of patients. Pleural fluid cultures remained negative in 37.9% of cases.

Besides antibiotic therapy, a variety of therapeutic options were utilised. In total, there were five specific treatment groups, which are listed in the table below.

<table>
<thead>
<tr>
<th>Group</th>
<th>Subjects n</th>
<th>Stage</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29</td>
<td>I</td>
<td>Thoracentesis only</td>
</tr>
<tr>
<td>2</td>
<td>214</td>
<td>II</td>
<td>Chest tube only</td>
</tr>
<tr>
<td>3</td>
<td>72</td>
<td>II</td>
<td>Chest tube + fibrinolysis</td>
</tr>
<tr>
<td>4</td>
<td>191</td>
<td>III</td>
<td>Chest tube + decortication</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>III</td>
<td>Primary decortication</td>
</tr>
</tbody>
</table>

Complete and partial responses were obtained in 58 patients (80.6%) who received fibrinolytic treatment.

Overall mortality rate was 1.55% (eight patients). Five of these patients presented with pneumonia and congestive heart failure. There was no mortality related to a surgical intervention.

Post-operative morbidity consisted of wound infection in 21 cases, delayed expansion in eight and atelectasis in 35 patients.

Conclusion
In paediatric empyema, treatment depends on the specific disease stage. When necessary, decortication is a valid option with a low mortality and morbidity rate.

Keywords
- Child
- Decortication
- Empyema
- Fibrinolysis
- Pneumonia

Message
Paediatric empyema should be approached in a stage-specific manner.

Editorial comment
This study proposes a stage-related approach to the management of paediatric post-pneumonic empyema. Fibrinolytic treatment was found to be useful in stage II empyema. The authors clearly show that aggressive treatment is feasible and well tolerated by the paediatric age group in more advanced, stage III empyema.

The role of video-assisted thoracic surgery (VATS) in the treatment of empyema remains controversial. As it is not available in the authors’ institution, its specific contribution could not be evaluated in this study. VATS has been found to be feasible in paediatric empyema. However, to have a substantial impact on the length of hospitalisation and to avoid extensive adhesions, which render a VATS approach impossible, it should be used early in the course of the disease; a 4-day limit was recently proposed. Fibrinolytic treatment or a thoracotomy with decortication should be considered afterwards.

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Original article