

Neonatal Loculated Empyema: A Diagnostic Dilemma

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Abstract

Pleural empyema secondary to bacterial infection is common in pediatric age but rare in neonates. Congenital lesions of lung are to be kept in mind while dealing with cases of respiratory distress especially in early age. We present here a case of neonatal respiratory distress who was managed with differentials of lung abscess, empyema and infected congenital pulmonary airway malformation and underwent decortication. Baby is doing good in follow up.

Keywords: Newborn, Staphylococcus, Lung disease, Congenital pulmonary airway malformation, Empyema.

INTRODUCTION

A neonate may have respiratory distress of variable severity and causes may be numerous. Bacterial empyema is a common cause of morbidity in pediatric age group, but neonatal empyema is a rare disease. Mediastinal shift on X-ray and respiratory distress may point towards pleural effusion/empyema, mass lesion or congenital lung lesions. Computed tomography is modality of choice for investigation. Optimal management especially role of surgery is controversial in neonatal empyema [1]. Clinical and radiological parameters guide for need of surgical intervention [2].

CASE REPORT

A 28-days-old male neonate was referred to us with complain of fast breathing and refusal to feeds from 2 days. Baby was born at term and appropriate for gestational age with birth weight of 2.4 kg and cried immediately after birth. Baby developed icterus at day 3 of life and underwent exchange transfusion at day 5 of life at a private hospital. Baby developed some discharge per umbilicus after 10 days and admitted to private hospital for umbilical sepsis. On routine investigations there, baby had raised total leucocyte counts (TLC) of 25100/cmm, blood urea 30 mg/dl and serum creatinine of 1.0 mg/dl. He received i.v. antibiotics but developed fast breathing and refusal to feeds. Babygram revealed dextrocardia due to some mass lesion in left hemithorax and was referred to us.

Weight at presentation was 2 kg (expected weight for age 4.5 kg). Baby had tachypnea with respiratory rate of 40/minute. Heart rate was 144/min and capillary refill time more than 3 seconds. Anterior fontanelle was open and at level, with peripheries warm and palpable pulses with good volume. SpO₂ on oxygen was 90 %. Air entry on left hemithorax was absent. Rest of the examination was unremarkable with normal

umbilicus. Baby was started on i.v. cefotaxime and amikacin. Laboratory investigations revealed TLC of 17300/cmm, platelets 3.7 lakhs/cmm and CRP of 83 mg/L. Renal and liver function tests and electrolytes were within normal limits. Blood culture sent at admission was sterile. Chest X-ray had white out lung on left hemithorax (Figure 1a) with cardia pushed to right and bilateral normal costophrenic angles. Contrast enhanced computed tomography of chest revealed a large cystic lesion with enhancing walls in left hemithorax (Figure 1b and 1c) and baby was planned for thoracotomy and proceed with a provisional diagnosis of infected Congenital pulmonary airway malformation (CPAM). At left thoracotomy via 5th intercostal space, loculated empyema was found and decortication was done (Figure 1d). He was transfused packed RBC in immediate post-operative period. Pus culture showed growth of Methicillin resistant Staphylococcus aureus (MRSA) at 24 hours of incubation and clindamycin was added as per sensitivity. Histopathological examination showed fibromuscular tissue with marked ulceration and acute inflammatory exudate on the surface. The fibrous tissue had moderate reactive dysplasia and findings were consistent with loculated empyema. Slowly baby had decreasing counts and CRP levels and could be discharged after 16 days of hospital admission. Baby has been in follow up for 2 years with regular left shoulder girdle exercises to prevent frozen shoulder and chest deformity secondary to thoracotomy.

DISCUSSION

Empyema thoracis is a common entity reported to occur in up to 28% children hospitalised for community acquired pneumonia [3]. Yield on culture is variable from 48 to 82 % in literature. The yield may be low due to late presentation/referral or previous use of antibiotics [1,4]. Staphylococcus continues to be the most common causative organism for empyema in the tropics and subtropics. Hot and humid climate favors excessive sweating which in turn favors growth of cutaneous flora and staphylococcal pyoderma. Hematogenous spread from these

lesions may cause pneumonia and parapneumonic empyema. Though there were no pyodermal lesions in our case, empyema pus yielded MRSA. A 10-year review of 265 patients by Baranwal AK et al reported community acquired MRSA in only 3

patients [1]. The widespread use of b lactam antibiotics for minor ailments and community acquired MRSA is a concern for medical fraternity.

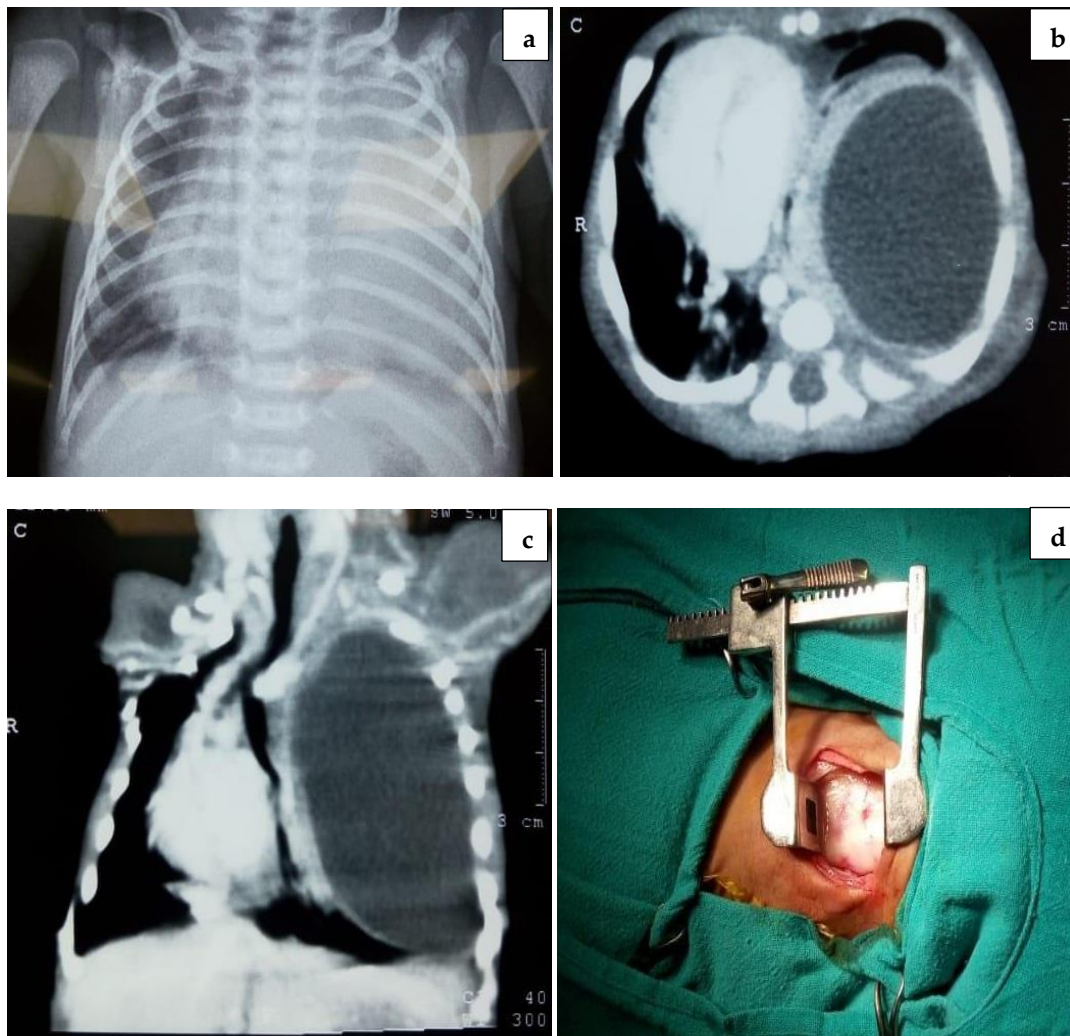


Figure 1: a- Chest X-ray showing white out lung of left hemithorax with cardia pushed to right and bilateral normal costophrenic angles. b and c- Contrast enhanced computed tomography of chest (transverse and sagittal cut) revealing a large cystic lesion with enhancing walls in left hemithorax. d- Intra-operative picture showing loculated empyema.

Imaging has central role in diagnosis of lung disease. The principal modalities are chest radiographs (CXR), ultrasound (US), and computed tomography (CT) [5,6]. It is not possible to distinguish between parenchymal consolidation and pleural fluid using plain radiographs [6]. Ultrasound (USG) is non-invasive, portable and easily available bedside tool to guide percutaneous drainage and drain placement. USG does reliably differentiate between parenchymal and pleural based processes and better delineation of fibrin/septae in pleural fluid [5,7]. CT should be used in complicated cases, such as patients planned for surgery or considered to have parenchymal abscesses or broncho-pleural fistulae.[8] The differentiation between parenchymal and pleural processes, identifying pleural thickening and loculations can be achieved very well with intravenous contrast (CECT) [8]. Though loculations were not seen on CECT in index case, a clear differentiation between loculated empyema, lung abscess or infected Congenital pulmonary airway malformations (CPAM) was not possible. So, the decision to proceed with surgery was taken.

Antibiotic therapy along with surgical interventions like thoracentesis, chest tube drainage, with or without fibrinolytic agents, videoscopic assisted thoracoscopic surgery (VATS) or decortication are employed for large empyemas, multiple loculated collections or children presenting with respiratory distress [9]. Literature shows that there are no data that correlate stages of parapneumonic effusion or empyema with specific management strategies [2]. A retrospective case series in children with empyema/parapneumonic effusion found that the presence of respiratory distress at presentation was related to prolonged stay and a higher likelihood for intervention [10]. The index case was a neonate and had respiratory distress at presentation along with tachypnea and oxygen requirement and later underwent surgical intervention.

LEARNING POINTS/TAKE HOME MESSAGES:

1. Any suspected chest mass lesion need to be evaluated with CECT chest.

2. A clear differentiation between parenchymal and parietal lesions may be at times not possible.
3. Staphylococcus continues to be the most common causative organism for empyema, with MRSA reserved for hospital acquired infections.
4. Surgery is last resort in diagnostic dilemmas.

Conflict of Interest

None declared.

Financial Support

None declared.

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