Scholars Journal of Medical Case Reports

OPEN ACCESS

Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com/journal/sjmcr/home

Congenital Pneumonia, Pneumothorax and Empyema Soon After Birth: A Rare Presentation

Dr. Mahmoud M. Osman*, Dr. Mohammed Saleh Alissa, Dr. Enas Mohamed Elsabagh, Dr. Suzan Abdelhamid

Neonatal intensive care unit, Al Yamamah Hospital, Riyadh, Saudi Arabia

DOI: 10.36347/SJMCR.2019.v07i11.005 | **Received:** 05.11.2019 | **Accepted:** 12.11.2019 | **Published:** 15.11.2019

***Corresponding author:** Dr. Mahmoud M. Osman

Abstract **Case Report**

Empyema thoracis is a rare cause of respiratory distress in neonates. It is a rare complication of congenital pneumonia with a fulminant course, rapid progression and a high mortality. Case characteristics: A newborn presented with respiratory distress, cyanosis and right pneumothorax. Her condition rapidly deteriorated, so intubated and mechanically ventilated. Empyema thoracis was diagnosed and the infant was managed with chest tube drainage and appropriate antibiotics. She gradually improved and discharged home in good condition.

Keywords: Neonatal, Empyema Thoracis, Congenital Pneumonia, Pneumothorax, Thoracocentesis.

INTRODUCTION

Empyema thoracis is defined as pyogenic infection of pleural cavity with accumulation of purulent effusion in the pleural space which can be diffuse or loculated. It is typically a serious complication of pneumonia. However, it can also arise from penetrating chest trauma, esophageal rupture, complication from lung surgery, after thoracentesis or chest tube insertion [1]. Empyema thoracis is not a well-known entity in the neonates and reports are scanty in medical literature. Early-onset pneumonia complicated with empyema is most commonly caused by group B Streptococci, E. coli, Klebsiella pneumonae or Enterococci. It is fulminant with rapid progression and a high mortality [2]. Herein we are presenting a case of neonatal empyema which has occurred in our hospital's NICU.

CASE REPORT

A female infant born at 38 weeks' gestational age through spontaneous vaginal delivery to a primigravida mother with history of GDM on insulin and antenatally diagnosed polyhydramnios. Her birth weight was 3.4 kg and Apgar score was 7 and 8 at 1and 5 minutes after birth respectively. The baby was sent to NICU for further observation. At the age of 4 hours she became cyanotic with respiratory distress; Chest x-ray was taken and showed right side pnemothorax (Figure-1). Oxygen was given via nasal prongs. Antibiotics (Ampicillin and Gentamycin) were started after partial septic screening. The baby kept NPO and IV fluids then total parenteral nutrition (TPN) were commenced.

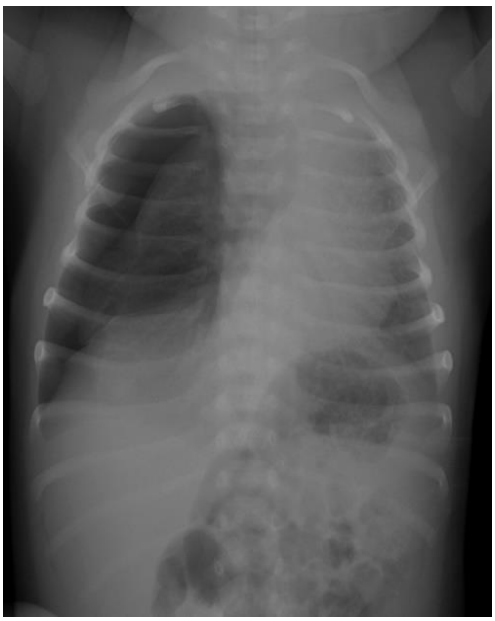

Fig-1: Chest radiograph at 4 hours showing right side pneumothorax

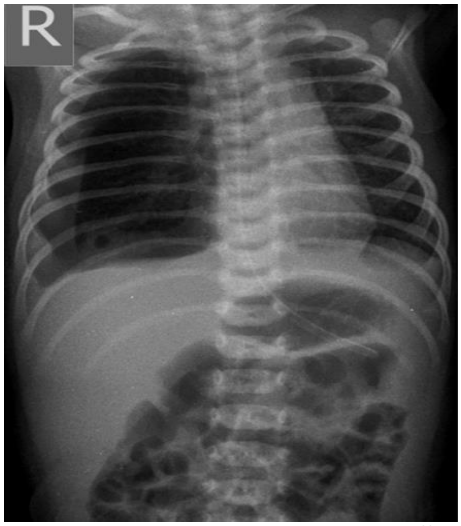

Fig-2: Chest radiograph showing right side pleural effusion and pnemothorax

Echocardiography was done and revealed small PDA and wide PFO. Chest and abdomen ultrasound scan showed bilateral minimal pleural effusions and normal abdomen study. She was maintaining normal O_2 saturation and followed by chest x-rays which showed gradual resorption of pnemothorax. On the 4th day of life, she developed tachypnea with subcostal retractions so shifted to nasal CPAP, and antibiotics were changed to (Vancomycin and Meropenam) after taking blood culture. Chest x-ray revealed moderate plural effusion on the right side (Figure-2). As there is no clear lung pathology; chest CT scan was taken and showed right pneumothorax, bilateral pneumonias and bilateral pleural effusions more on the right side (Figure-3). Diagnostic right side thoracocentesis was performed which drained turbid empyema fluid that was sent for analysis and culture. Baby was intubated and attached to mechanical vetilator. Intercostal chest tube was inserted and attached to under water seal which drained empyema fluids (70 ml in the 1st 24 hrs). The empyema progress was followed by serial chest ultrasound scans and chest radiographs which showed progressive decreasing in the empyema fluid bilaterally (Figure-4).

Fig-3: CT- scan chest revealed right pneumothorax, bilateral pneumonic patches and pleural effusions

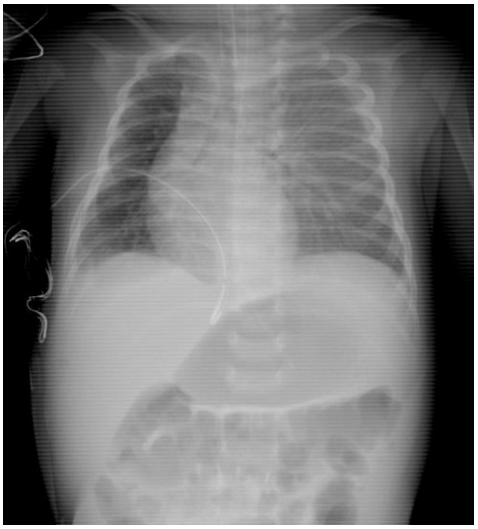

Fig-4: Chest radiograph showing right side chest tube and resolving pnemothorax and pleural effusion

The chest tube was removed when the empyema fluid ceased (after 8 days).The general condition was progressively improved and the baby was extubated to blended oxygen then to room air. Antibiotics were stopped after 21 days when chest ultrasound scan revealed complete resorption of empyema fluids bilaterally. The infant was observed for another 2 days and repeated chest ultrasound scan showed no subsequent accumulation. She was discharged home in good general condition. The baby was seen in outpatient clinic 1 week later with no complaints.

DISCUSSION

Empyema thoracis may result from infection of the pleural cavity, surrounding lung tissues or mediastinum eliciting a parapneumonic inflammatory reaction with accumulation of exudative fluid in the plural space; this becomes populated by neutrophils resulting in pus formation [3]. Empyema thoracis is a very rare condition in neonatal period and accompanied with high mortality rate. Clinical manifestations at this time are not clear and imaging evaluation and a high index of suspicion should be entertained for diagnosis [4]. It has been suggested that insufficient immune response of the newborn in the early days of life cannot localize the infection to the pleura, and the capacity of the pleura to produce exudate is limited. Due to these factors, the incidence of empyema in newborn infants has been considered to be very low [5]. The most common causative organisms are S.aureus, E.coli, Klebsiella pneumoniae, haemolytic Group B streptococcus, haemolytic Group A streptococcus and Serratia species [6]. However, cultures were negative in the presented case because of prior use of antibiotics. Chest X-ray and ultrasound are helpful both in the diagnosis of pleural effusion and for monitoring its course. The diagnosis can be confirmed by thoracocentesis, and pleural fluid analysis and culture as occurred in our case. Empyema fluid culture is an

important diagnostic tool leading to identification of the bacterial pathogen in 60-80% of cases, in contrast to blood culture, which is positive in 13-31% [7]. In our case both blood cultures and empyema fluid cultures were negative most probably due to prior antibiotics administration.

Chest CT scan is not necessary for diagnosis due to its high radiation dose; if the diagnosis can be made with plain chest x-ray, ultrasound scan and thoracocentesis. However, it is essential if there are suspected underlying lung disorders which are not clear on the radiograph [8]. In our case chest CT scan was taken to delineate the underlying lung pathology; and the bilateral pneumonias were seen.

CONCLUSION

Empyema thoracis is a rare neonatal emergency with a fulminant course and high mortality rate. It must be considered and ruled out by proper imaging in every neonate affected by pneumonia who has complicated course. Diagnostic chest tap for pleural fluid analysis is essential for subsequent management. Early treatment with adequate antibiotics and chest tube drainage would be life-saving.

Funding: None
Conflict of Interest: None

REFERENCES

1. Mazumdar J, Sen S. Neonatal Empyema Thoracis. Journal Nepal Paediatr Soc, 2014;34(1):65-67.
2. Sabal S, Tiwari K, Poswal L. Congenital pneumonia with empyema at birth; a rare presentation. Int J Contemp Pediatr, 2017; 4:1541-2.
3. Aliyu I, Inuwa IM. Neonatal empyema thoracis in an African child: A case report. Sifa Medical Journal. 2015 Jan 1;2(1):18-20.
4. Norouzi E, Parizi Z, Niknafs P, Bijari B. (2019). Neonatal Empyema Thoracis: a case report. Journal of Kerman University of Medical Sciences, 26(1): 86-89
5. Özkan H, Çetinkaya M, Köksal N, Çelebi S, Hacimustafaoglu M. Pseudomonas aeruginosa pleural empyema in a preterm infant. The Turkish journal of pediatrics. 2009 Jul 1;51(4):395-398.
6. Shen YH, Hwang KP, Niu CK. Complicated parapneumonic effusion and empyema in children. Journal of microbiology, immunology, and infection= Wei mian yu gan ran za zhi. 2006 Dec;39(6):483-8.
7. Erol S, Dilli D, Aydin B, DİNLEN N, ZENCİROĞLU A, OKUMUŞ N. Pleural empyema due to group A betahemolytic streptococci in a newborn: case report. Tuberk Toraks. 2013;61(2):152-4.
8. Ahmad A, Adamu YM, Dambatta AH, Lawan B. Massive pleural empyema in infancy. Nigerian Journal of Basic and Clinical Sciences. 2016 Jul 1;13(2):125-127.