Primary Lung Abscess in Early Infancy

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Background: Lung abscess is rare in early infancy. **Case characteristics**: We report two infants with lung abscess, who presented with short respiratory illness.**Intervention**: Infants were managed with broad spectrum antibiotics including Clindamycin. Needle aspiration was attempted in one case. **Message**: High index of suspicion in infants with respiratory distress of prolonged duration can help in reaching the diagnosis.

Keywords: *Infants, Pulmonary abscess, Staphylococcus.*

Lung abscess is a rare condition and much rarer in early infancy [1,2]. It is characterised by coagulative necrosis of one or more areas of lung, with more predilection for right lung. Post-pneumonic abscess is the common variant; however, in young infants and neonates, de novo occurrence of abscess is reported more often [1]. Unless the condition is complicated by dissemination, recovery is a rule with appropriate antibiotics alone [3]. We present two cases of primary lung abscess in early infancy managed with intravenous antibiotics.

CASE REPORT

Case 1: A-6-week-old infant with uneventful antenatal history, presented with low grade fever for 1 day, followed by non-paroxysmal cough that was persisting till the time of admission. On admission to emergency, child was in respiratory distress with rate of 54/min. Examination revealed deceased air entry on the right infraclavicular area. Examination of other systems was normal. *X*-ray of chest revealed rounded homogenous opacity involving right hemithorax, silhouetting the right mediastinal margin (***Fig.* 1*a***) with normal costo-phrenic angle. Contrast enhanced computed tomography (CECT) of the chest (***Fig.* 1*b***) revealed a heterogeneous fluid-filled lesion arising from the right upper lobe, which was suggestive of a primary lung abscess, infected congenital cystic adenomatoid malformation, or a germ cell tumour of mediastinum. Fine needle aspiration cytology was attempted, which did not show any representative tissue. Total leukocyte count was 16500 with 57% polymorphs, which substantiated an infectious pathology. Infant improved after intravenous antibiotics for 3 weeks followed by oral antibiotics. No organism was isolated from other sterile sites such as blood and CSF, thus the antibiotics of choice were based on the local epidemiology and sensitivity pattern. Metabolic parameters were normal, with normal growth during hospital stay and repeat chest *X*-ray showed significant improve after one week (***Fig.* 1*c***). Infant was discharged on oral antibiotics.

Case 2: A 10-week-old, previously normal, and infant was admitted in Pediatric Pulmonology ward with the complaints of fever, cough and rapid breathing of 10 days duration. Examination revealed tachypnea, S_PO_2 of 92%, with subcostal retractions, nasal flaring and dull note in right mammary and infraaxillary area with diminished breath sounds in the above mentioned area. The baby was initially treated as community acquired pneumonia; however, the chest *X*-ray revealed a homogenous opacity involving right upper and middle zone with polymorph nuclear response in hemogram, thus possibility of lung abscess was considered. In view of early infancy associated congenital malformation was also considered and CECT chest was done, which revealed cystic collection in the right hemithorax suggestive of lung abscess. Blood cultures and CSF analysis were negative. Patient was started on Cefotaxime, Amikacin, Cloxacillin and Clindamycin to cover gram positive, gram negative and anaerobic organisms. Respiratory distress improved remarkably; chest *X*-ray repeated after one week revealed clearing of the opacity.

In both the patients, organism could not be isolated. Work-up for primary and secondary immunodeficiency, and cystic fibrosis was normal. Total duration of antibiotics was 6 weeks including 3 weeks each by intravenous and oral route.

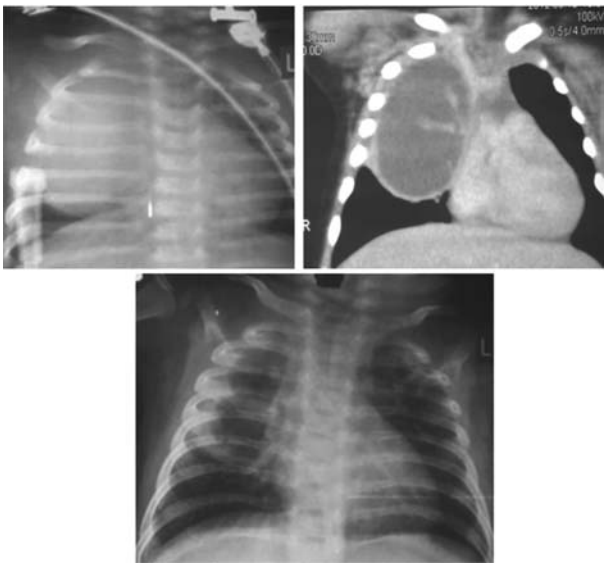

FIG. 1 *Chest radiograph with right hemithorax opacity sparing costo-phrenic angle (1a), CECT chest in coronal view showing mass lesion in the right upper hemithorax suggestive of lung abscess (1b), and chest radiograph showing clearing of abscess after one week of antibiotics (1c).*

DISCUSSION

Primary lung abscesses are rare in early infancy; however, cases have previously been reported showing that the clinical course is somewhat different from the older children [1,3,4]. The right lobe is more commonly affected [4] and associated lung malformations are reported in nearly half of the patients [5]. The most likely pathogenesis of primary lung abscess involves an area of initial pneumonitis leading to necrosis, cavitation and abscess formation [9]. Factors such as prior viral infections like measles, empyema, under-nutrition and developmental delay [9] were implicated in the predisposition, though our cases were previously well without any major risk factors. Presentation varies from typical pneumonic symptoms to atypical, smouldering course, which can be easily overlooked.

Implicated organisms are *Staphycoccus aureus, beta hemolytic streptococci, Hemophilus influenza and Streptococci pneumoniae*, which can be found alone or in combination [3]. The organism profile is different in secondary lung abscess where anaerobes are more common. In a study from China, multitude of organisms was isolated including Aspergillus and *Pseudomonas species* [6]. In majority of the instances the organism profile is comparable to the abscesses at other site like brain and abdomen [7]. Before the advent of antibiotics, surgical drainage was the mode of therapy [1]. Microbial therapy is the cornerstone for the lung abscess and it should be based on the local epidemiology and culture and sensitivity pattern [5,6]. The reported duration of therapy varied from 5 days to 3 weeks of parenteral followed by 4-8 weeks of oral therapy; neonates may require total course through parenteral mode only [2]. Therapeutic interventions like bronchoscopy, trans-tracheal drainage, aspiration, and lobectomy are done only when medical therapy fails, which may also yield the causative agent [3,5]. Before any intervention, these abscesses should be differentiated from staphylococcal pneumatoceles as management differs [5]. The role of repeat imaging for documenting the resolution of infection is debatable and no specific guidelines are set, consensus is to repeat after the completion of total course of antibiotics [2]. Mortality is less than 5% in children [8].

To summarize, in two cases of lung abscess discussed here without any underlying predisposing factors, the most likely pathogenesis would be post-pneumonia. Lung abscess should be considered as a differential diagnosis in all infants presenting with clinical features suggestive of severe community-acquired pneumonia in which chest radiograph reveals focal or diffuse homogenous opacity.

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