PULMONARY ALVEOLAR PROTEINOSIS

ZIAEDDIN GHORASHI*
HASSAN S. AHARI*
VAHID MONTAZERI**
SAEED RAD***

SUMMARY: A 22-month-old female child was referred with failure to gain weight, chronic cough and dyspnea. In physical examination she was under 5th percentile, had respiratory distress and crackles in chest auscultation. Chest roentgenography revealed alveolar infiltration in lungs. Sweat chloride test and standard work up for pulmonary tuberculosis were non-conclusive. Regarding X-ray findings suspicious of pulmonary alveolar proteinosis (PAP), right anterolateral thoracotomy was performed and lung tissue biopsy taken. Histopathologic findings were consistent with PAP which is a rare cause of chronic cough and dyspnea in children.

Key Words: Pulmonary alveolar proteinosis, chronic cough, dyspnea, failure to thrive.

INTRODUCTION

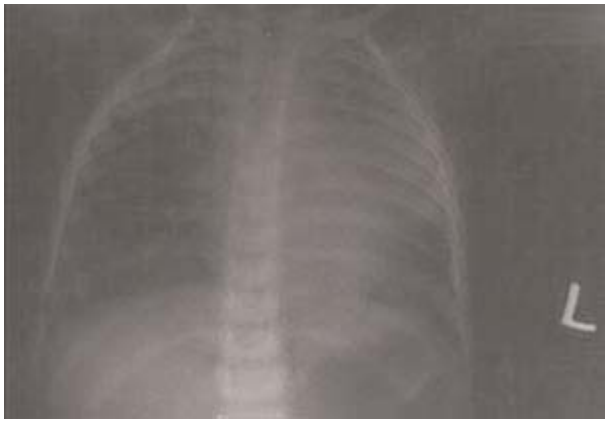
Pulmonary alveolar proteinosis (PAP) is a syndrome of unknown cause characterized by progressive dyspnea and cough. It was first described in 1958 by Rosen and co-workers (1). The exact incidence of PAP is unknown, and by 1980 only 260 case reports had been published (2). Two clinical childhood forms of PAP have been described: a fatal congenital form which is immediately established in the newborn period and an acquired type, similar to that described in adults (3). The onset may be abrupt or insidious. Physical findings usually consist of only a few scattered crackles and in chronic cases growth failure is common (1). Chest radiographs typically demonstrate symmetric fluffy, perihilar alveolar infiltrates, but unilateral involvement occurs in 20% of patients as well (2). Lung biopsy is a more commonly used method to prove the diagnosis ante-mortem (1). In children, the mortality rate to date is more than 75 per cent, with the duration of illness ranging from a few days to several months (1).

Case presentation

A 22-month-old female child presented with the chief complaint of protracted cough and growth retardation. She had no problems until 6 months of age when her physical growth diminished considerably and non-productive cough developed. Coughing aggravated since one month prior to admission. In spite of several outpatient based medical intervention no improvement was seen, therefore she was hospitalized in Tabriz Children Medical Center for the first time. Vaccination was up to date. Physical examination revealed an ill looking, nontoxic child, weight 7 kg, tem-

*From Department of Pediatrics,
**From Department of Thoracic Surgery,
***From Department of Imaging, University of Medical Sciences, Tabriz, Iran.

Figure 1: Chest X-ray, alveolar infiltration in lungs.



perature 37°C, respiratory rate 59/min, pulse rate 120/min, head circumference 44.5 cm. She had respiratory distress and was acyanotic. Heart exam was normal, there was diffuse crackles in both lung fields. Organomegaly and lymphadenopathy were not detected. Intravenous fluid, ceftriaxon and vancomycin were administered. Paraclinical results were as follows: hemoglobin 14.4, white blood cell 6000, erythrocyte sedimentation rate 4, C-reactive protein, manthoux test, gastric lavage for acid fast bacilli smear, sudan test and sweat chloride test were all negative. Chest X-ray showed alveolar infiltration in right and left upper lung lobes (Figure 1). CT scan of the lung revealed scattered alveolar infiltration in both sides, suspicious of tuberculosis (TB) and PAP (Figure 2).

One week of treatment with broad spectrum antibiotics, yielded no improvement. Hence after receiving negative results of investigations for cystic fibrosis (CF) and TB, surgical consultation for lung biopsy was requested. On the 8th day of admission, anterolateral thoracotomy with pulmonary wedge resection was performed. The patient developed respiratory failure immediately after surgery in recovery room, then put under mechanical ventilation and unfortunately expired after 48 hours due to interactable hypoxemia. The report of histopathologic study of the lung tissue revealed Alveoli filled with eosinophilic amorphous and fine granular material. The alveolar wall appearance was not remarkable. These findings were consistent with PAP (Figure 3).

DISCUSSION

PAP is a rare disease characterized by intra-alveolar deposition of granular, eosinophilic, periodic acid-schift (PAS) positive proteinaceous material (1, 4). Deposition of this material which is composed primarily of lipoprotein (surfactant apoproteins) and is thick, viscid and surfactant-like, results in cough, dyspnea and impaired gas exchange (2). Involved patients present with dyspnea, fatigue, cough, weight loss, chest pain or hemoptysis. In the advanced stages, cyanosis and digital clubbing may occur (3). The clinical presentation of PAP is nonspecific, thus, the diagnosis is frequently missed, leading to inappropriate therapy and unnecessary morbidity (5). The disorder is

Figure 2: CT scan of the lung. Scattered alveolar infiltration in lungs.

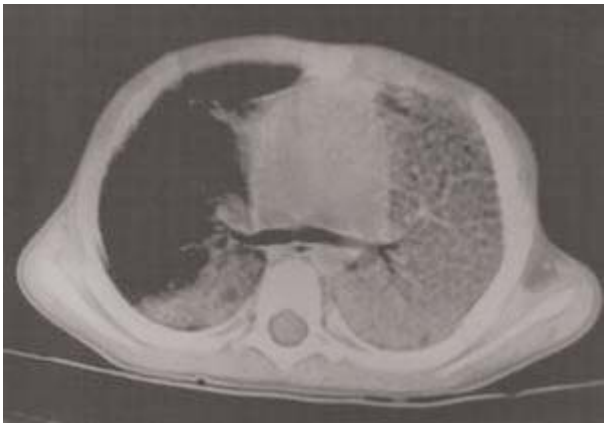
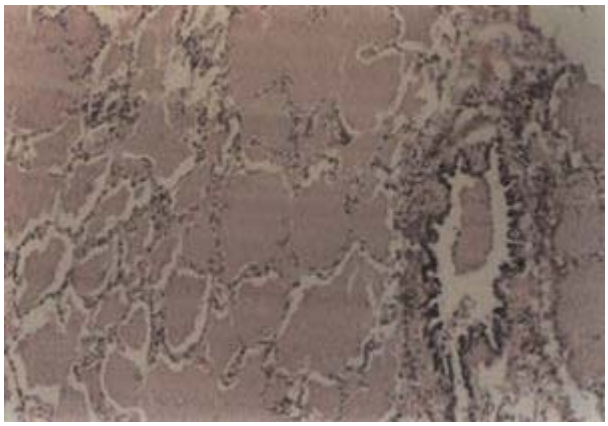


Figure 3: Lung biopsy. The alveoli are filled by eosinophilic amorphous and fine granular material.



often clinically and radiographically indistinguishable from other pulmonary and cardiac disorders such as pneumonia, persistent pulmonary hypertension, neonatal respiratory distress syndrome and congenital heart disease (CHD) (3). Sobiecka (6) and co-workers reviewed 7 cases of PAP during 11 years period in all of them the diagnosis was obtained by open lung biopsy. Untreated idiopathic congenital PAP is fatal, lung transplantation therefore is the only currently available therapeutic option. Repeated bronchoalveolar lavage is the treatment of choice for patients with acquired form of PAP (3). The point worth highlighting in this report is the fact that in patients with chronic cough and FTT, although CF, TB, CHD and other disorders are more common in developing countries, rare diseases such as PAP, also should be included in differential diagnosis.

REFERENCES

1. Riley H : Pulmonary alveolar proteinosis. In: Disorders of the respiratory tract in children. Ed by E Kendig, V Chernick, 5th Ed, WB Saunders Company, London, pp 492-495, 1990.

2. Lynch J, Raghu G : Major pulmonary disease syndromes of unknown etiology. In: Textbook of pulmonary diseases. Ed by G Baum, J Crapo, B Celli, J Karlinsky, 6th Ed, Lippincott-Raven, New York, pp 431-476, 1998.

3. Harvey C, Aaron H : Pulmonary alveolar proteinosis. In: Nelson textbook of pediatrics. Ed by R Behrman, R Kliegman, 16th ed, WB Saunders Company, Philadelphia, pp 1297-1298, 2000.

4. Crocker HL, Pfitzner J, Doyle IR, Hague WM, Smith BJ, Ruffin RE : Pulmonary alveolar proteinosis: Two contrasting cases. Eur Respir J, 15:426-429, 2000.

5. Mazzone P, Thomassen MJ, Kavuru M : Our new understanding of pulmonary alveolar proteinosis: What an internist needs to know. Cleve Clin J Med, 68:977-978, 981-982, 984-985, 2000.

6. Sobiecka M, Korzeniewska-Kosela M, Kus J : Pulmonary alveolar proteinosis. Pneumonol Alergol Pol, 68:441-449, 2000.

Correspondence:
Ziaeddin Ghorashi
B.N 4 Golpar, Azadi Avenue,
Code 51639, Tabriz,
IRAN.