STAPHYLOCOCCUS AUREUS CAUSES HONEYCOMB LUNG
IN A GHANAIAN CHILD

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SUMMARY

This is a case report of Honeycomb Lung seen in an 18 months old Ghanaian child who was on admission for Staphylococcal pneumonia of the right lung.

She was initially diagnosed as having a typical right lobar pneumonia and treated with routine antimicrobials used in the Child Health Department of Korle-Bu Teaching Hospital (KBTH). Her failure to respond appropriately, a repeat chest x-ray was requested. This revealed the honeycomb changes in both her lungs. Cloxacillin was added to her medications and postural drainage was recommended. This improved her clinical condition significantly. No other etiology known to be associated with honeycomb lung was detectable in the patient. She recovered completely after six-weeks of antistaphylococcal antibiotics.

Honeycomb lung has never been reported in the Ghanaian literature.

INTRODUCTION

Honeycomb lung describes a pathologic state in which the lung is studded with many small cysts of several millimetres in diameter\(^1,2\). Radiologically, this entity is revealed by fine and coarse reticular appearances which are seen as small roundish translucencies on the chest x-ray\(^1\).

Cysts in the lung occur uncommonly as congenital cysts; but more commonly, they are acquired and chronic changes in the lungs\(^3-6\). They may be solitary or localised, irregular or diffusely distributed in one or both lungs\(^3,6\); and they are more often found in lower lobes\(^2\). They present at all ages\(^3,7\) and in both sexes\(^3\). Majority are discovered incidentally at post mortem as cause of death or associated with causes of death\(^6\).

Regarded as resultants from forces of mechanical obstruction and inflammatory process in the literature, classification of lung cysts appears moot as there are several\(^6,8\). Conway\(^8\), however, subdivided them into five including pneumatoceles and honeycomb lung. The exact mechanism leading to honeycombing of lungs is unknown; but they appear to develop in a number of systemic diseases\(^1,2,6,10-16\).

Among systemic diseases associated with honeycomb lung are inflammatory diseases, connective tissue disorders, endocrine, neurocutaneous syndromes, neoplasias, mucoviscidosis and occupational diseases. Unclassified diseases\(^17\) like sarcoid,
amyloid and histiocytosis 'X' have also been primary cause of honeycombing.

Prognosis in most cases is poor; as complications of spontaneous pneumothorax, respiratory failure and progressive right ventricular failure - cor-pulmonale is their bane. 6-9.

The purpose of this publication is to report this interesting radiologic finding which has several possible etiologic causes. This is the first case report of Honeycomb Lung in Ghana.

CASE HISTORY

F.A., 18 months old was referred to the Children's Block, Korle-Bu Teaching Hospital with diagnoses of left lobar pneumonia, anaemia and malaria. She had been seen earlier in two clinics at Accra. Her main complaints were fever, cough, loss of appetite and mild semi-formed diarrhoea stools. She had been unwell for 3-5 days prior to her admission. This was her first hospitalisation, she had no significant family, social, drug or past medical history. The parents are a young couple, a trader and farmer; and there is no consanguinity. F.A is the only child, her development is within normal but her immunizations had not been regular.

Her physical examination showed her very febrile temperature 40°C, weight 9.7kg., head circumference 46.5cm, very pale, anicteric, not cyanosed or clubbed; well hydrated but in severe respiratory distress with respiratory rate 96/min. Her ear, nose and throat were normal, she had no palpable peripheral lymph nodes. Her skin had no scars, marks or lesions. Systemic examination: Her chest was dull to percussion, breath sounds were diminished bilaterally, there were bronchial breathing and medium crepitations more on the right side than the left. She had tachycardia, no gallop or murmur was heard. The abdomen was soft, liver was 5cm, and spleen 2cm palpable. She was conscious and her neck was supple. Musculoskeletal system was normal. Her diagnoses were: bilateral pneumonia, severe anaemia, malaria. Intravenous crystalline penicillin, ½ mega unit 6 hourly, intranasal oxygen and intramuscular frusemide 10 mg stat were also given. Chest X'Ray confirmed bilateral pneumonia. See Picture I. On the third day of admission in the Emergency Room, she convulsed and meningitis was suspected; lumbar puncture done showed normal cerebrospinal fluid. She was finally admitted on P2A Ward for management of her bilateral pneumonia and anaemia. She was transfused with 300 ml of packed red blood cells.

She was on penicillin but without much response. She had a spike of temperature on the 5th day in hospital and intravenous chloramphenicol 200mg, 6 hourly was added to her treatment. Her respiratory distress lessened but did not significantly improve and her chest signs were virtually unchanged by the 7th day. Repeat chest x-ray done showed bilateral honeycomb lung changes; See Picture II. Cloxacillin 250mg by intravenous route, 6 hourly and suspension Brufen 100mg by mouth, 8 hourly were added to her treatment. Postural drainage was advised. These improved her clinical condition with subsidence in her respiratory distress and disappearance of signs of consolidation from the chest, confirmed by another chest x-ray done 9 days later.

Investigations done during her admission were as follows: haemoglobin (post transfusion) - 14Gm%, blood film - negative for malaria parasites, white blood cells - 9.1 x 10⁹/L, neutrophils - 68%, lymphocytes - 30%, eosinophils - 2%. Her sedimentation rate was only 6 mm/hr. Sickling was negative. Her urine specific gravity was 1030, skull x-ray - normal; and her electroencephalogram as well as the electrocardiogram were both unremarkable.

Her serum sodium was 133mmol/L, potassium 5mmol/L, urea 2.7mmol/L, total protein 62gm/L,
Picture I: Chest X-ray of Patient Showing Extensive Consolidation of the Right Lung

Picture II: Her Repeat Chest X-ray Showing Honeycombing of Both Lungs
albumin 36gm/L, globulin 26g/L. Serum creatinine 3.6mmol/L. Rheumatoid factor was negative. Bone marrow showed no histiocytes. Her blood culture grew Staphylococcus aureus sensitive to cloxacillin. Bronchoscopy could not be done because of instrument failure; bronchography was discussed but was not recommended. High Resolution Thoracic Computerised Tomography (HRCT) is unavailable in Ghana.

Patient was discharged in satisfactory health, to complete the six week course of Cloxacillin. Mother was to administer postural drainage at home. She will attend follow-ups weekly. See Picture III.

DISCUSSION

In paediatric practice cystic lungs can be seen in all ages\textsuperscript{3,7,18,19}. In Wilson-Mikity Syndrome and Bronchopulmonary dysplasia, the roentenograph is described as "bubbly lungs" as seen in both non-ventilated and ventilated premature babies respectively\textsuperscript{18,19}. Outside the latter group of patients, honeycomb lung is not at all a nosologic entity on the basis of etiology, pathology or clinical\textsuperscript{3}. Essentially a radiologic diagnosis; in recent times, High Resolution Computerised Tomography (HRCT) is used where available in patients with systemic diseases with well known propensity for lung involvement, as occurs in some collagen diseases; and also in unclassified disease entities like sarcoid, fibrosing alveolitis, amyloid and histiocytosis 'X'. HRCT has increased pre-mortem detection of Honeycomb lung in these technically endowed countries\textsuperscript{11,12,20,21}.

F.A., a toddler, did not have any of the above named diseases. Her problem was of inflammatory etiology - Pneumonia. Staphylococcal pneumonia\textsuperscript{7,11,22} is well known to progressively develop into pneumatoceles in the course of seven days; with subsequent spontaneous reversal in lung parenchymal changes over a period of 6 weeks or more if antistaphylococcal antibiotics are used for

\begin{center}
\textbf{Picture III: Both Lung Fields are Clear on this Chest X-ray.}
\end{center}

\textbf{The Egg-on-Side Cardiac Silhouette is not consistent with patient's non-cardiac status.}
treatment. She was managed with Cloxacillin, Brufen and postural drainage was done twice daily. She showed clinical as well as radiologic improvement with this management and was able to be discharged. Her physical features and laboratory results did not indicate any other disease process known to cause Honeycomb Lung.

Bronchogram was not done because this procedure never yielded the desired results.\textsuperscript{10}

Cystic Fibrosis\textsuperscript{23} is the only genetic and recessively inherited condition among the several causes of this entity - Honeycomb lung; which is also described as “Bubbly Lung” or “Worm-eaten lung”\textsuperscript{6,17}.

Most of the underlying causes of this radiologically interesting diagnosis are incurable, steroids have been tried in some cases but to no avail\textsuperscript{24}. Honeycomb lung appearance caused by \textit{Staphylococcus aureus} infection is curable, as demonstrated by this case.

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**REFERENCES**


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