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Case Report

A Classic Case of Bronchiectasis Presenting as an Uncommon Complication of Measles Infection: A Case Report

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Abstract
Bronchiectasis is primarily a disease of the bronchi and bronchiolar dilation involving a vicious circle of transmural infection and inflammation with mediator release(1). It is an uncommon disease with a potential to cause devastating illness, including repeated respiratory infections requiring antibiotics, disabling productive cough, shortness of breath, and occasional hemoptysis(2,3). Prevalence figures have varied from 4 to 272 per lakh population, partly dependent upon the age range studied. There are many causes of bronchiectasis. We present here a case of childhood brochiectasis which occurred as a result of recurrent respiratory infections post measles infection in an unimmunised child.
Keywords: *Bronchiectasis, Pneumonia, Measles, Infections, Immunization.*

Introduction

Bronchiectasis is a disease characterized by permanent dilation of bronchi and bronchioles caused by destruction of muscle and elastic tissue, resulting from or associated with chronic necrotizing infection(1). Bronchiectasis (broncos- airways; ectasia- dilatation) is a morphological term used to describe abnormal irreversibly dilated and often thick-walled bronchi. This is an anatomic definition and is thought to have evolved from Laennec's original description in 1819 of ectaticbr-onchi in pathological specimens. Bronchiectasis was a common disabling and fatal condition in the preantibioticera. Still it remains an important cause of suppurative lung disease in the developing world. More recently, the declining incidence of this disease in the developed world attributed to the advent of improved living conditions, frequent and early use of antibiotics, improved sanitation and nutrition and introduction of childhood immunization, particularly against measles and pertussis.. There are sparse dataon the prevalence of bronchiectasis in the Indian subcontinent. We report here a classic bronchiectasis case which occurred due to recurrent pneumonia following measles infection.

Case Report

A seven year old girl presented with repeated episodes of cold, cough fever, respiratory distress for which she was taken to multiple hospitals since three years. She was once admitted in another hospital for severe pneumonia. Presently child came with watery nasal discharge with cough, mucopurulent sputum, non bloody, non foul smelling. She also had periumbilical abdominal pain, with no radiation, no diurnal and postural variation, low grade fever, not associated

with chills, rigors or rash. During infections she was treated with antibiotics, nebulisations with bronchodilators. Her symptoms responded only to recur again in few weeks interval. Past history revealed measles at four years age after which she started developing these recurrent respiratory infections. Antenatal history was uneventful with maternal weight gain of eleven kilograms, fullterm baby delivered by caesarian section, cried immediately after birth with birth weight of 3.5 kgs. No neonatal jaundice, seizures and breast fed within six hours after birth. Developmental history revealed milestones attained normally as per age. Immunization was done as per UIP schedule only until six months of age. There is no history of allergy or atopy. Contact with tuberculosis is a possibility as her grandfather had cough for many years but was not evaluated. Family history revealed a third degree consanguous parentage, first in birth order, other two siblings arenormal. Patient belonged to low social economic status.

Examination revealed a moderately built and nourished child, coherent, with caries of first and second molars on right side. There was no pallor, icterus and edema. There was clubbing of all fingers and cervical lymphadenopathy of one centimeter size (1x1 cm jugulodigastric soft present).

Vital data: Temperature – 100^0 F,Pulse rate - 96 per min, respiratory rate - 28 per minute, blood pressure - 100/60 mm Hg and all peripheral pulses were well felt.

Anthropometry Height - 123 cms (expected 119 cms), weight – 20 kgs (expected 22 kgs), head circumference - 52 cms, chest circumference - 52 cms. Examination of upper respiratory tract was normal. Examination of chest revealed bilaterally symmetrical movements of chest, equal inter scapular distance on palpation, vocal fremitus equal on both sides on palpation. On percussion reasonant note was felt all over areas.Auscultation revealed normal vesicular breath sounds in all areas and left infra axillary, infrascapular crepitation, and right inframammary, infraaxillary coarse crepitations.

Investigations

Complete blood picture: Hb- 11.5gm/dl,TLC– 15,000 cells/cu.mm, PMN-70%, Platelets- 4.5 lakhs/cu.mm, Microcytic hypochromia with anisocytosis, RBS – 94mg/dl, Blood urea- 36mg/dl, Serum creatinine- 0.6mg/dl, Serum sodium- 156meq/l , Serum potassium - 3.9meq/l , CUE – Normal , Urine for Culture – NO bacterial growth, PT –18.4 sec, INR- 1.71, TSB – 0.7 mg/dl ; Direct Bilirubin- 0.3 mg/dl, Total serum proteins- 6.6 g/dl; Serum albumin- 3.4 g/dl, Serum globulin -3.2 g/dl, sputum for AFB and TBNAAT –Negative, Mantoux- No induration after 48 hours, Chest X-ray- bilateral patchy opacities in paracardiac regions. X-ray paranasal Sinuses- Normal, 2D-ECHO- Normal study, Pulmonary function tests-obstructive pattern, CT Scan- nontapering tubulardilated bronchi in right middle and left lower lobes, bronchoscopy –mucus plugs in right middle and left lower lobes.

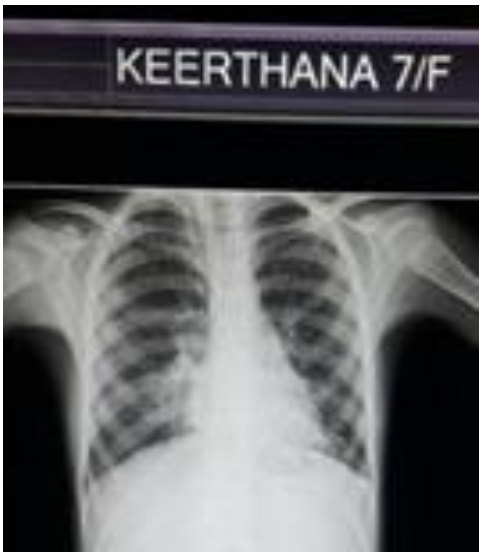


Figure 1: Chest X ray of the patient

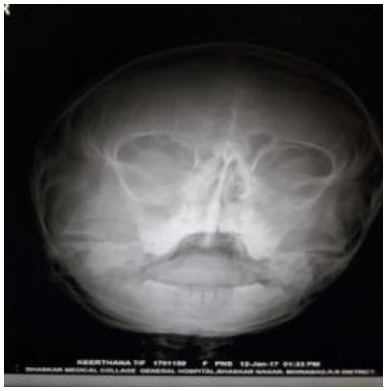


Figure 2: X ray of paranasal sinuses of the patient

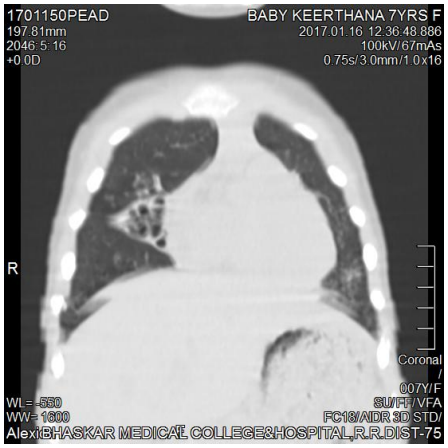


Figure 3

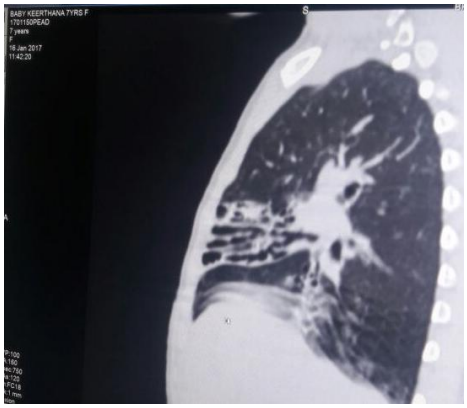


Figure 4

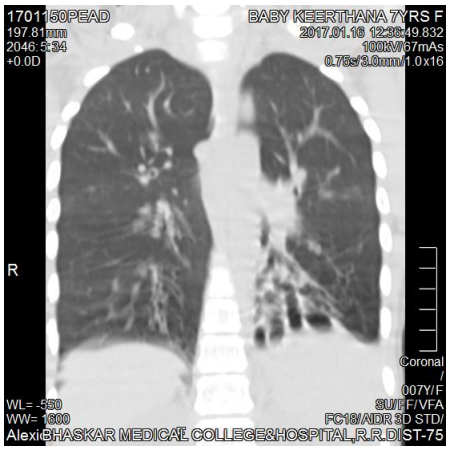


Figure 5: Tram track appearance

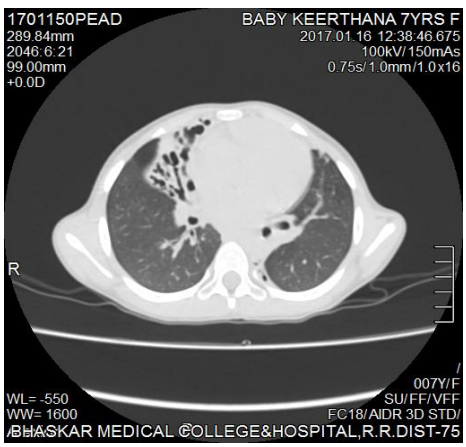
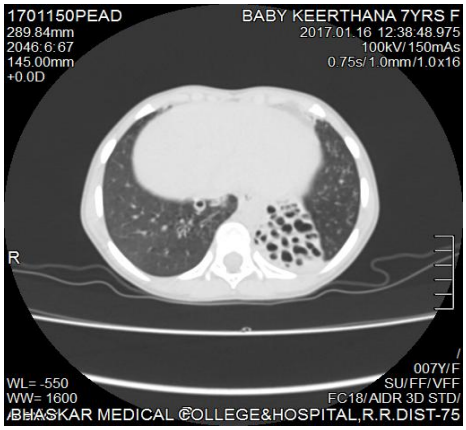


Figure 6



Figures 3 to 7: CT scan images of chest of the patient. Last image showing axial section reveals signet ring sign(ratio of bronchiole to artery >1).

Diagnosis

Right Middle Lobe and Left Lower Lobe Tubular Bronchiectasis with Recurrent Pneumonia as a Sequela to Measles Infection

Discussion

Bronchiectasis[4] is primarily due to Staphylococcus aureus, Klebsiellapneumoniae, P. aeruginosa and tuberculosis[5]. Congenital causes of bronchiec-tasid are immunoglobulin[6] deficiency (IgG, IgM and IgA), complement deficiency and chronic granulomatous disease, Cystic fibrosis[7], Young's syndrome (obstructive azoospermia and chronic sinopulmonary infections), Primary Ciliary Dyskin-esia, Allergic Bronchopulmonary Aspergillosis, Inflammatory bowel disease, Rheumatoid arthritis[8].

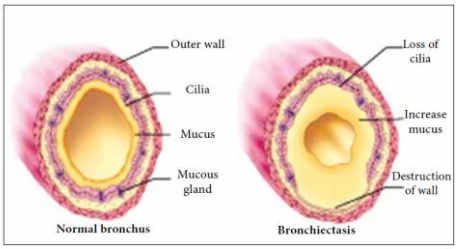


Figure 8: Pathogenesis of bronchiectasis

The basic pathophysiology among all the conditions that lead to bronchiectasis is that they either lead to alteration in the pulmonary defense mechanisms, or are associated with inflammation. Regardless of the initiating event, the ultimate result is loss of the mucociliary transport, rendering increased susceptibility to microbial colonization that leads to inflammatory response

and progressive lung damage. Neutrophils are thought to play a central role in the pathogenesis of tissue damage that occurs in bronchiectasis. It has been found that the sputum of patients with bronchiec tasis has high levels of neutrophil products, such as elastase and superoxide radicals. Neutrophil elastase is a serine proteinase that has been implicated in the pathogenesis of bronchiectasis, emphysema and adult respiratory distress syndrome which cause tissue damage, bacterial colonization mediated through its destructive effect on IgA, thus allowing bacterial adherence to the lung epithelium and affecting the phagocytic and the complement-fixing activity of IgG. A number of inflammatory mediators like Interleukin 8 (IL-8), InterleukinIβ (IL-1β), Interleukin 10 (IL-10), Interleukin 6 (IL-6), Tumour necrosis factor alpha (TNF-a) and Leukotriene β4(LT- β4) are involved in the recruitment and activation of neutrophils, in patients with bronchiectasis. TNF-a leads to the expression of chemo-attractants and IL-8 leads to neutrophil degranulation. Endogenous nitric oxide production is involved in the pathogenesis of bronchiectasis by direct cytotoxic effects on the bronchial epithelium and also through the formation of a highly cytotoxic compound, superoxide anion.

Types of Bronchiectasis -cylindrical bronchiectasis (tubular), varicose bronchiectasis cystic or saccular bronchiectasis.

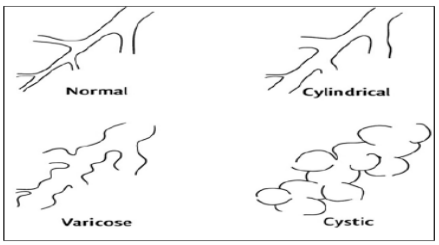


Figure 9: Types of bronchiectasis

Measles is a childhood infection occurring in unimmunised children with fever and respiratory symptoms. The most common complications of measles are otitis media, bacterial broncho pneumonia, laryngitis, tracheitis, bronchitis, giant cell pneumonia and flaring up of tuberculosis[9]. Bronchiectasis[10] is an uncommon complication of measles.

Summary

We present here a classic case of bronchiectasis with recurrent pneumonia which occurred as an uncommon complication of measles infection. This underlines the importance of prevention of measles with proper immunisation as the infection can lead to disastrous complications in children.

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