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Case Report

Bilateral Pulmonary Opacities in a 72-Year-Old Man: Pulmonary Alveolar Microlithiasis or Aspiration of Barium Contrast?

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Abstract

Aspiration of barium sulphate is known to sometimes accidentally occur during upper gastrointestinal contrast studies.

Certain conditions affecting the anatomical and functional integrity of the oropharyngeal and esophageal tract such as extreme old age, alcoholism, head and neck cancer, bronchoesophageal fistula, disordered swallowing, neuromuscular dysfunction, and psychological illness serve as predisposing factors for the occurrence of aspiration into the tracheobronchial tree.

We describe here the case of a 72-year-old man with nasopharyngeal carcinoma who presented with dry cough, scattered bilateral coarse crepitations and diffuse whitish opacities in both lower zones of the lungs on chest radiography, in whom a differential diagnoses of pulmonary alveolar microlithiasis and aspiration of barium sulphate contrast medium was made.

Keywords: *Pulmonary Alveolar Microlithiasis; Aspiration; Barium Contrast*

Introduction

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Certain conditions affecting the anatomical and functional integrity of the oropharyngeal and esophageal tract such as extreme old age, alcoholism, head and neck cancer, bronchoesophageal fistula, disordered swallowing, neuromuscular dysfunction, and psychological illness serve as predisposing factors for the occurrence of aspiration into the tracheobronchial tree.

Case Report

A 72-year-old man was admitted to the hospital with complaints of dry cough since one week. He was a known case of nasopharyngeal carcinoma on treatment with combined chemotherapy and radiotherapy. The patient also gave history of dysphagia since 2 years. He was a fruit vendor by profession. On examination, the patient was cachexic. His vital parameters were normal. On systemic examination, a dull note on percussion was elicited over the infrascapular and lower axillary region on the right side. Scattered coarse crepitations were heard in the interscapular and infrascapular regions of the chest, bilaterally.

A chest radiograph was done. It showed a diffuse whitish opacity in both lower zones of the lungs which appeared to fill the alveolar spaces bilaterally. In addition, a pleural collection with pleural thickening was noted on the right side with obliteration of the right costophrenic angle (Figure).

Figure : *Chest radiograph showing a diffuse whitish opacity in both lower zones of the lungs which appears to be filling the alveolar spaces bilaterally. In addition, a pleural collection with accompanying pleural thickening is noted on the right side with obliteration of the right costophrenic angle.*

An HRCT-chest scan was done. It showed numerous sand-like calcifications scattered throughout both lower lobes and the right middle lobe of the lung. Multiple small nodular opacities were also seen in the superior segments of both lower lobes. A right pleural collection was also noted with rim enhancement extending into the right oblique fissure. A provisional radiological diagnosis of Pulmonary Alveolar Microlithiasis with right pleural thickening was made.

However, on further questioning, the patient gave history of a barium swallow having been done one year ago during which he had a spasmodic bout of coughing and vomiting. Hence the diagnosis was revised to aspiration of barium sulphate contrast material, following barium swallow contrast studies for upper GI investigation, as it was a more likely possibility.

Discussion

Aspiration of barium sulphate is a known complication that may occur during upper gastrointestinal contrast studies [1].

Certain conditions affecting the anatomical and functional integrity of the oropharyngeal and esophageal tract serve as predisposing factors for the occurrence of aspiration into the tracheobronchial tree [1-4]. These might be extreme old age [3-5], alcoholism [2], head and neck cancer, bronchoesophageal fistula [6], disordered swallowing, neuromuscular dysfunction, and psychological illness.

Barium sulphate being an inert material does not usually cause chemical pneumonitis in the lungs if the quantity aspirated is small. However, if the quantity aspirated is large, it may interfere with gas exchange at the alveolar level as the barium fills the alveolar spaces, leading to a shunt effect and altered ventilation/perfusion (V/Q) ratio with consequent respiratory failure [7]. There have also been reports of patients developing a severe inflammatory reaction of the bronchial walls following aspiration of contrast material, thereby increasing morbidity in these patients [8].

The main presenting symptom in these patients is cough. Symptoms of respiratory tract infection usually occur only if there is simultaneous aspiration of gastric contents.

Aspiration of barium contrast material into the respiratory tract results in the accumulation of this substance in the bronchoalveolar spaces and the visualization of radio-opacities of varying sizes on chest radiography. Radiographically, it can present as centrilobular micronodules, thickened interlobular septa or subpleural cysts on HRCT [4].

Differential diagnosis, in cases where the history is unreliable or unavailable, include pulmonary alveolar microlithiasis (as it has a very similar paving pattern in the lower lobes of the lungs), pulmonary ossifications of various causes, hemosiderosis, calcium deposition within the alveolar spaces due to hypercalcemia in patients with chronic renal failure and secondary hyperparathyroidism, silicosis, heavy metal pneumoconiosis and amiodarone toxicity [3,4].

There are as yet no prospective controlled trials on the treatment of this rare type of complication. Hence, the treatment of this condition is based on sound clinical judgment. In cases of severe arterial hypoxemia with accompanying dyspnea after massive aspiration of barium contrast material, bronchoscopy is usually recommended to remove as much barium as possible, and to also obtain aspirates for pathological testing. Bronchoalveolar lavage is not recommended because of the danger of further dissemination of the contrast medium into the bronchoalveolar spaces [2]. Broad spectrum antibiotic treatment with good anaerobic coverage should be undertaken in patients with suspected infection [2]. Kinesitherapy with postural drainage has also been suggested.

Complications of aspiration of barium sulphate contrast material depends on the quantity and density of the aspirated material, the extent of tracheobronchial involvement and the overall general condition of the patient. In severe cases, early treatment and close follow up with HRCT chest scans are essential to prevent further progression to pulmonary fibrosis.

Conclusion

There are no definite statistics available regarding the incidence of contrast aspiration following upper GI investigations. While in some patients few symptoms may be noted, in others it may cause severe complications which may even lead to death. Hence, in patients who develop acute breathlessness after upper gastrointestinal studies, barium sulfate-related aspiration pneumonia should be strongly suspected so that prompt treatment may be instituted in order to reduce morbidity and the incidence of mortality, in such cases.

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