Case Report

ERA'S JOURNAL OF MEDICAL RESEARCH VOL.10 NO.1

10.24041/ejmr2023.23

TOTAL LUNG COLLAPSE TREATED WITH EFFECTIVE PHYSIOTHERAPY AND PHARMACOTHERAPY

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Received on : 17-12-2022
Accepted on : 11-05-2023

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ABSTRACT

Acute mucus plugging causing lung collapse is an emergency associated with increased mortality specially in patients with impaired cough reflex. Bronchoscopic interventions are often required in emergency to relieve the patient however mechanical percussive chest physiotherapies may be helpful. We discuss a case of a patient who developed respiratory distress rapidly; a chest radiograph revealed right lung atelectasis suggesting acute mucus plugging, confirmed by HRCT thorax. Bedside chest physiotherapy was started along with preparing for bronchoscopy. Clinical improvement was observed. Chest x-ray was repeated before going for bronchoscopy which revealed resolution of collapse hence procedure was not done. Our case illustrates the utility of chest physiotherapy and mucolytics in resolving the lung collapse due to acute mucus plugging in an urgent scenario in high-risk patients with recent history of head and neck surgery.

KEYWORDS: Physiotherapy, Mucus plug, Bronchoscopy, Lung collapse.

INTRODUCTION

Respiratory diseases can be related with abnormally thick mucus that pool within the airways, causing bronchial obstruction. Usually the mucus is expectorated out with the act of coughing but it can be difficult for the patients of respiratory illnesses to cough out thick mucus which can obstruct airways and cause partial or total collapse of lungs. Mucus plugging is a common occurrence in therapeutic settings, specially in patients with history of recent surgery and with diminished cough reflex and bronchoscopic intervention is typically used for treatment (1). Physiotherapy, adequate hydration, bronchodilation, and mucolytic agents are very useful in managing acute mucus plugging causing collapse of lung. We describe a patient's case having history of head and neck surgery and diminished cough reflex who developed sudden breathlessness due to acute mucus plugging and was relieved by physiotherapy and mucolytics thus highlighting the importance of non-bronchoscopic interventions.

CASE PRESENTATION

A 48 year old female presented to us with complaints of dry cough following one episode of vomiting 1 day before admission which was associated with fall in saturation (75% on room air) as observed by the attendants. She had history of craniotomy after a road traffic accident 8 months back and since then she was on a liquid diet via Ryle's tube as advised by the neurosurgeon. On admission, Physical examination revealed respiratory rate of 22 breaths per minute, heart rate of 86 beats per minute, and blood pressure of 138/92 mm of Hg, saturation of 97% with 5 liters of oxygen support via facemask (78% on room air), harsh vesicular breath sounds on left side with reduced air entry on right side on auscultation, GCS was E4V1M3(8/15). ABG revealed type 1 respiratory failure with pH 7.45, pCO2 30.4 mmHg, pO2 68 mmHg, HCO3 25.7 mmol/L. A chest x-ray was performed which revealed complete collapse of right lung probably due to acute mucus plugging in right bronchus, which was confirmed on HRCT scan (Picture 2 and Picture 3). She also had a previous X-ray which showed no signs of any collapse (Picture 1). Patient was planned for bronchoscopic intervention and while preparing for bronchoscopy, she was put on chest physiotherapy by respiratory physiotherapist and mucolytics via nebulisation. The patient responded to the physiotherapy and showed clinical improvement. After 2 days, chest X-ray was performed as pre test evaluation for bronchoscopy which showed clearance of the right lung collapse along with marked clinical improvement (Picture 4) so bronchoscopy was deferred and with physiotherapy and mucolytics patient responded clinically without any further clinical complication and was discharged in stable clinical condition.

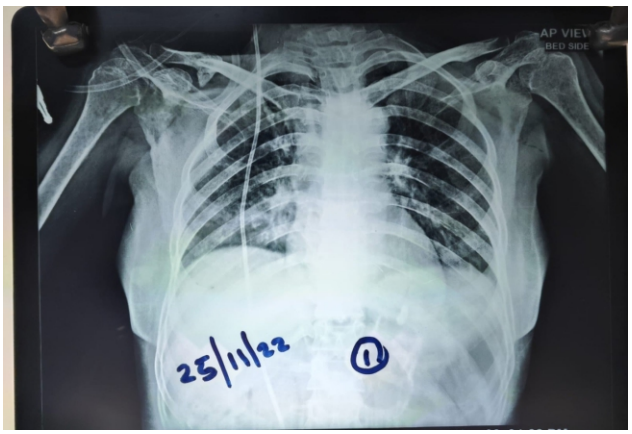

Fig. 1: Chest x-ray showing normal looking picture without any signs of Collapse

Fig. 2: Chest x-ray showing complete Collapse of right Lung

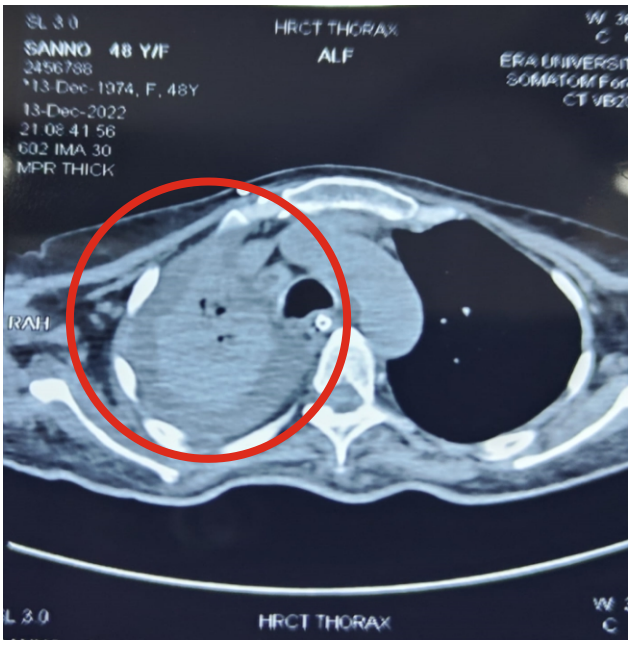

Fig. 3: HRCT Thorax section showing Collapse of right Lung

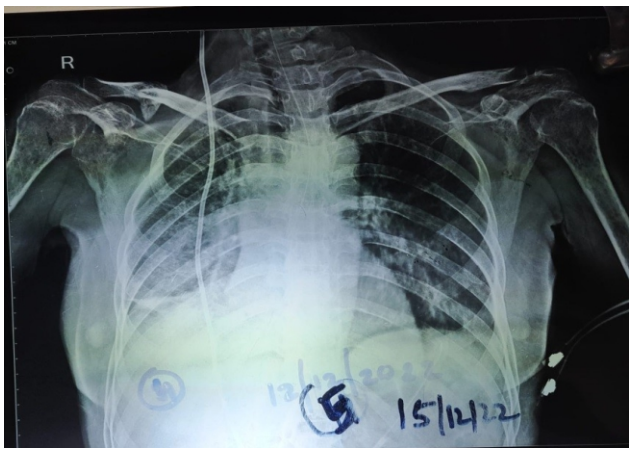

Fig. 4: Chest x-ray showing normal looking picture without any signs of Collapse

DISCUSSION

Normally, the tracheobronchial tree secretes mucus which serves a protective function. Cough reflexes are hindered in respiratory disorders which causes secreted mucus to build up and cause bronchial blockage and poor oxygen exchange(1). Mucus plugging os common complication in post-operative period. Post craniotomy status with diminished cough reflex came out to be the contributory factors for acute mucus plugging in our case. Mucoid impaction of the major airways can result from both congenital and acquired disorders that often manifests as the finger-in-glove sign. The sign can also be seen in a variety of acquired disorders (broncholithiasis, allergic broncho-pulmonary aspergillosis, foreign body aspiration etc.). Computed tomography (CT) scan is better than chest skiagraphy for differentiating between mucus impaction and other disease processes such as arterio-venous (A-V) malformations and for guiding additional diagnostic testing (2). Bronchoscopic intervention remains the backbone of treatment for acute mucus blockage but chest physiotherapy including postural drainage, chest wall percussion and vibration and a forced expiration technique (called huffing), improve lung mechanics and gas exchange while reducing risk of atelectasis and infection by increasing airway clearance from the lungs (3). Bronchoscopy not only helps in relieving the symptoms but also helps in finding the cause of collapse and diagnosing different diseases(4,5). Many procedures can be done using bronchoscopy including, foreign body extraction, Bronchial wash, Bronchoalveolar Lavage (BAL), transbronchial lung biopsy (TBLB) and endobronchial biopsy (EBB) (6-7). Even if the collapse is resolved by supportive therapies bronchoscpic measures still may be needed for definitive diagnosis and further treatment.

CONCLUSION

Our case illustrates that mucolytics and chest physiotherapy can be a very helpful tool to try before bronchoscopic intervention is used as the final form of treatment, especially when it is not available. To best of our knowledge, there is no such case report detailing about use of chest percussion physiotherapy in post-operative patients presenting with lung collapse due to mucus plugging, hence we are reporting this case.

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How to cite this article:

Kacker R., Manchanda J., Rani H., Gupta K.B., Roohani U. Total Lung Collapse Treated With Effective Physiotherapy And Pharmacotherapy. Era J. Med. Res. 2023; 10(1): 140-142.