ORIGINAL RESEARCH PAPER

Paediatric Surgery

# BRONCHOPULMONARY FISTULA IN A NEONATAL

**KEY WORDS:** Fistula, bronchopulmonary, neonate

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**ABSTRACT**

We report a rare case of a 1.2kg preterm neonate with bilateral pneumothorax and air leak diagnosed as bronchopulmonary fistula secondary to the use of a suction catheter. HRCT Thorax confirmed the site of the leak. Bronchopulmonary fistula repair was done after the failure of conservative management.

## INTRODUCTION

In neonates, especially in preterm neonates, treatment of respiratory distress using invasive mechanical ventilation may result in pneumothorax. A massive, persistent air leak despite drainage of pneumothorax or pneumothorax requiring insertion of multiple intercostal drainage tubes may indicate the formation of broncho-pleural fistula(BPF). This is usually traumatic in origin, resulting most commonly from trauma from the thoracotomy tube.

This fistulous tract forms a pathway of least resistance to inspired air thereby increasing respiratory distress and worsening ventilatory pressures.

In this case report we describe the diagnosis and management of a neonate with BPF probably secondary to trauma due to a suction catheter.

### Case Report

An 1100-gram extremely low birth weight neonate born extremely preterm (30-31 weeks) admitted in the neonatal intensive care unit (NICU) given respiratory distress was intubated immediately post-delivery upon arrival in the NICU. On the second day of life, the patient developed spontaneous bilateral pneumothorax which was confirmed on a chest radiogram for which bilateral intercostal drains were inserted. On the third day of life, a chest radiogram showed a decrease in pneumothorax on the left side but not on the right side. Hence another intercostal drain was inserted on the right side. Air column movement was present in all three intercostal drains, but both on the right side showed a massive air leak. A repeat chest radiogram showed persistent pneumothorax on the right side. A high-resolution computed tomography(HRCT) of the chest was done which showed gross right pneumothorax with near complete collapse of the right lung and mild mediastinal shift towards left with lateral segmental bronchus of right lower lobe reaching up to pleural surface and opening into the pleural cavity suggestive of bronchopleural fistula with left Congenital Cystadenoid Malformation.

After the failure of conservative management, the patient was posted for surgery. After doing a right thoracotomy, a bronchopulmonary fistula was identified and a repair was done. (Fig. 1) The patient was gradually weaned from mechanical ventilation and extubated on post-operative day 3. Post-operative chest radiogram showed resolved bilateral pneumothorax.

The patient was followed post-operatively at two weeks when we did a suture removal and at one month when a repeat HRCT Thorax was performed. It was normal and showed no pneumothorax or a bronchopulmonary fistula. The patient had spontaneous normal breathing without any respiratory distress and had adequate weight gain.

## DISCUSSION

Respiratory distress is a common cause of mortality and morbidity in newborns, especially preterm neonates, and is also one of the major indications for admission in neonatal intensive care units. In developed countries, this incidence varies from 2 to 3.9% whereas according to Indian studies this incidence ranges from 0.9%-8.3%. [1]

Pneumothorax in preterm neonates with respiratory distress vary from 3%(receiving mechanical ventilation) to 9%(receiving continuous positive airway pressure (CPAP) support) [2]

Pneumothorax is a known complication of ventilator therapy. The basic principle in the treatment of pneumothorax is to drain the air and keep the lung expanded which is achieved by inserting an intercostal drainage tube. Persistent pneumothorax or pneumothorax requiring insertion of two or more intercostal drainage tubes indicates the presence of a bronchopleural fistula. One of the causes of persistent pneumothorax in a neonate who requires mechanical ventilation is the overzealous use of an endo-tracheal suction catheter causing a ronchopleural fistula.[3]

Bronchopleural fistula is an abnormal communication between the bronchus and the pleural cavity resulting in a persistent leak or more commonly used term bubbling for 24-48 hours after intercostal drain tube insertion. If BPF can be maintained with chest tubes and suction, pleurodesis will take place. Gradually the bronchopleural fistula will become a controlled fistula which eventually will get sealed off by fibrosis. Emergency thoracotomy is used as a final resort for the management of bronchopleural fistula in selected patients unresponsive to conservative management.

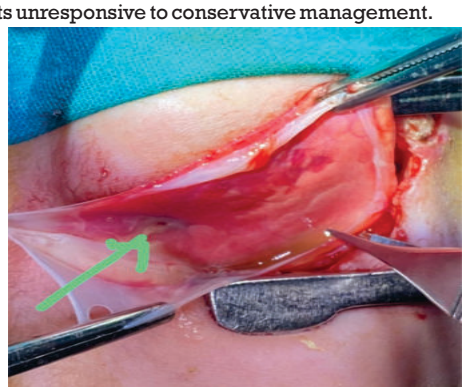

**Figure 1:** Intra-operative Photo of bronchopulmonary fistula.

## CONCLUSION

Bronchopleural fistula resulting in tension pneumothorax in early and late preterm neonates is a rare and difficult problem to deal with. Conservative management must be employed initially but surgery can be resorted to as a last option in very sick neonates or in those who have failed conservative management.

### Declaration Of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts Of Interest-** There are no conflicts of interest.

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