Pneumorrhachis in a Patient with Stable Bronchial asthma

Madhusmita Mohanty Mohapatra, Manju Rajaram, Dharm Prakash Dwebedi, Govindraj Vishnukanth
Department of Pulmonary Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

Abstract

The presence of air in the spinal canal, called pneumorrhachis, is an important radiographic finding. Pneumorrhachis is usually asymptomatic and resolves spontaneously. Sometimes, neurological complications might develop. We report a case of pneumorrhachis occurring in an adolescent male with stable bronchial asthma who presented with pneumomediastinum and subcutaneous emphysema without a pneumothorax.

Keywords: Bronchial asthma, pneumomediastinum, pneumorrhachis

INTRODUCTION

Pneumorrhachis is defined as a condition characterized by the presence of air in the spinal canal. While a small pneumorrhachis might be clinically asymptomatic, larger ones could cause neurological complications such as intractable headache and even paraplegia.[1] It is usually diagnosed incidentally on computed tomogram (CT) of thorax. Although pneumorrhachis occurs following spinal trauma, barotrauma, or pneumothorax, its association with bronchial asthma is rare. To date, 13 cases of pneumorrhachis associated with acute exacerbation of bronchial asthma have been reported in the literature. However, there are no reports of pneumorrhachis in patients with clinically stable asthma.[2] We report a case of a pneumorrhachis occurring in an adolescent male with clinically stable bronchial asthma.

CASE REPORT

A 17-year-old male presented to us with violent cough and breathlessness (modified Medical Research Council scale Grade II) of 2 days’ duration. He was not a smoker. He was a known case of mild intermittent bronchial asthma for 2 years and was not on regular medications. He did not give any history of recent worsening of his bronchial asthma. He had no history of trauma or narcotic drug abuse. He was not a treated case of tuberculosis nor had active tuberculosis. On clinical examination, he was acyanotic, had a pulse rate of 72 beats/min, and blood pressure was 120/80 mmHg. His respiratory rate was 22 breaths/min, and the oxygen saturation was 99% by pulse oximetry while breathing room air. He had a diffuse swelling in the neck, upper anterior chest wall, and axilla on both sides along with palpable crepitus. Auscultation revealed crepitations over the anterior chest wall on both sides. Examination of other systems including neurological and cardiovascular systems did not reveal any abnormality.

A CT scan of the chest was advised for this patient. The scanogram revealed subcutaneous emphysema with pneumomediastinum [Figure 1]. CT cuts over midthorax confirmed the initial findings [Figures 2 and 3a], and a few air pockets were seen in the thoracic epidural space without vertebral erosion or intervertebral disc abnormality [Figure 3b]. There was no evidence of pneumothorax, emphysematous bullae, cysts, or pleural effusion. A diagnosis of bilateral subcutaneous emphysema, pneumomediastinum, and pneumorrhachis was made. He was administered high-flow oxygen and bronchodilator therapy. The subcutaneous emphysema and pneumorrhachis improved symptomatically on conservative management with high-flow oxygen and did not require any other intervention. A chest radiograph done after 5 days showed significant reduction of the subcutaneous emphysema. He was discharged with an advice to continue medications for his bronchial asthma. At 1-month follow-up,

Address for correspondence: Dr. Madhusmita Mohanty Mohapatra, Department of Pulmonary Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Gorimedu, Puducherry, India.
E-mail: drmadhusmita1@gmail.com

How to cite this article: Mohapatra MM, Rajaram M, Dwebedi DP, Vishnukanth G. Pneumorrhachis in a patient with stable bronchial asthma. Int J Adv Med Health Res 2018;5:31-3.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

© 2018 International Journal of Advanced Medical and Health Research | Published by Wolters Kluwer - Medknow
the patient showed improvement in clinical condition with a normal-looking chest radiograph.

**Discussion**

Pneumorrhachis is a rare condition characterized by the presence of air in the spinal canal. Air pockets may be found either in the intradural or extradural space. It was first reported by Gorden in 1977, and the term pneumorrhachis, however, was coined later by Newbold in 1987.\(^3\)\(^,\)\(^4\) Although a rare entity, a few cases have been documented in the literature in which acute exacerbation of bronchial asthma was complicated by occurrence of pneumorrhachis. The mechanism of pneumorrhachis has been postulated to be an increase in intra-alveolar pressure secondary to violent coughing against a closed glottis. The rupture of alveoli leads to leakage of air into peribronchovascular space, from where air takes the path of least resistance and enters into the mediastinal pleura and then the fascial planes of the neck. The absence of fascial barriers between mediastinal pleura and the epidural space allows air to enter through neural foramina\(^3\)\(^,\)\(^4\). After entering into the epidural space, air collects posteriorly where there is least resistance. Pneumorrhachis is usually asymptomatic and resolves spontaneously where the intraspinal air gets absorbed completely into the circulation.\(^5\)

Most patients with pneumorrhachis are treated conservatively unless and until it is associated with neurological or cardiovascular symptoms. Hence, no specific management guidelines have been mentioned in the literature for treatment of pneumorrhachis.\(^6\)\(^,\)\(^7\) Bronchial asthma could be complicated by pneumothorax at times and rarely pneumomediastinum. Isolated pneumomediastinum with pneumorrhachis is the rarest of complications. Pneumorrhachis may correlate with the severity of subcutaneous emphysema. As larger air pockets can cause neurological compromise, it is necessary for the treating physician to order a CT thorax in cases of bronchial asthma with subcutaneous emphysema and neurological symptoms so that timely management could be offered.

**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.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.
REFERENCES

1. Kim SW, Seo HJ. Symptomatic epidural pneumorrhachis: A rare entity. J Korean Neurosurg Soc 2013;54:65-7.
2. Manden PK, Siddiqui AH. Pneumorrhachis, pneumomediastinum, pneumopericardium and subcutaneous emphysema as complications of bronchial asthma. Ann Thorac Med 2009;4:143-5.
3. Gordon IJ, Hardman DR. The traumatic pneumomyelogram. A previously undescribed entity. Neuroradiology 1977;13:107-8.
4. Newbold RG, Wiener MD, Vogler JB 3rd, Martinez S. Traumatic pneumorrhachis. AJR Am J Roentgenol 1987;148:615-6.
5. Eroglu U, Yakar F, Zaimoglu M, Ozates O, Ozgural O, Ugur HC, et al. Pneumorrhachis. Asian J Neurosurg 2016;11:172-3.
6. Eesa M, Kandpal H, Sharma R, Misra A. Spontaneous pneumorrhachis in bronchial asthma. Acta Radiol 2006;47:672-4.
7. Uemura K, Behr R, Roosen K. Symptomatic intraspinal air entrapment. Br J Neurosurg 2000;14:154-6.