

CHAPTER VI

CATAMENIAL PNEUMOTHORAX

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1. An Overview of Pneumothorax

Pneumothorax is defined as the accumulation of air in the intrapleural space and the resulting lung collapse ¹. (Figure)

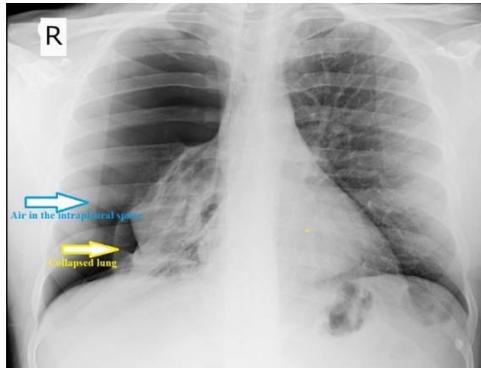


Figure: Demonstration of pneumothorax on Chest X-ray

The term of pneumothorax was first used by Itard in 1803 ². It is more common in male sex ¹. Its incidence is 18-28 / 100000 in male gender and 1.2-6 / 100000 in female gender ². It is frequently observed in smokers, those with bullous lung parenchyma, those with weak and tall body types and its frequency is highest in the 30s ages ^{1,3}.

Usually, sudden onset chest pain and dyspnea are the most observed symptoms. Severity of the symptoms can be mild or very high ⁴. Especially in cases such as tension pneumothorax, very severe symptoms and signs can be observed. On physical examination, a decrease in respiratory sounds and hyperresonance can be detected in the hemithorax, where is pathology. Radiological imaging methods play a key role in the diagnosis of pneumothorax. Radiological imaging methods are helpful in both

evaluating the extent of the pathology and making decisions for treatment choices ². Chest radiographs, ultrasound (USG), and tomography (CT) can be used to detect air collected in the intrapleural space and to monitor the follow-up-treatment course. The method of treatment varies depending on the presence of symptoms, the history diseases of the patient and the rate of pneumothorax. As treatment methods; With continuous oxygen therapy, observation, needle aspiration or percutaneous drainage, tube thoracostomy and operation can be performed in necessary patients.

In 1932, Kjaergaard defined pneumothorax in healthy individuals as primary spontaneous pneumothorax except disease or traumatic occurrence ^{2,5}. Pneumothorax can be grouped mainly as spontaneous and non-spontaneous. (Table)

Table: Pneumothorax Classification

SPONTANEOUS	NON-SPONTANEOUS
1-Primary Spontaneous Pneumothorax	1-Traumatic
2-Secondary Spontaneous Pneumothorax	2-Iatrogenic
3-Catamenial	
4-Neonatal	

2. Catamenial Pneumothorax

Catamenial pneumothorax (CP) is the recurrent accumulation of air in the intrapleural space and lung collapse in women who do not have any other lung disease. Pneumothorax may not be seen in every menstrual period ¹.

The origin of the word catamenial is Greek and means 'monthly' ². CP was first described in 1972 by Lillington et al. ⁶. In daily practice there is little awareness of CP and is often thought of as a simple case of pneumothorax ⁶. It is more common in the 30s-40s ages ⁷. Catamenial pneumothorax constitutes 2.8-5.6% of spontaneous pneumothoraces ^{7,8} and its actual rate is estimated to be higher ⁶. It is seen that the Turkish and English literature generally consists of case reports alone or small number of series which consists of limited number of cases. In fact, until 2019, the number of pneumothorax cases associated with the menstrual cycle in the literature is 350 ⁶.

CP is often accompanied by pelvic endometriosis (%55) ^{2,9}. Anyway, one of the areas where endometriosis is most frequently observed outside the pelvic area is the thorax ². Implants can be observed in the visceral-parietal pleura, lung parenchyma, bronchial system and diaphragm. Implants are more common in the diaphragm ^{6,9}. CP is often

associated with thoracic endometriosis in the pleura and lung parenchyma¹⁰. Although different anatomical and hormonal theories such as lymphagenic or hematogenic spread, and transdiaphragmatic transmission have been proposed in its etiology, the etiology has not been fully elucidated^{6,9}. There are some reasons for the build-up of air in the intrapleural distance. Firstly, air leakage may take place from the genital organs into the thorax through the diaphragm openings (fenestration) created by endometriosis, secondly, air leakage from the lung may be linked to the alveolar damage caused by increased prostaglandin F2 level in the blood during menstruation, thirdly, the build-up of air may stem from focal endometrial implants¹¹. It is also one of the reasons suggested when local hyperinflation caused by implants in the terminal bronchioles causes pneumothorax by creating a check-valve mechanism⁶. Satisfactory explanations have not yet emerged for matters such as why the use of anti-inflammatory drugs that reduce the prostaglandin level cannot prevent pneumothorax, why more frequent pathology is observed in the right hemithorax⁸, and how endometrial tissue reaches the thoracic area².

CP typically occurs 2-3 days before the menstruation^{2,11}. Recurrences coinciding with the menstrual cycle are observed and are frequently (85-95%) observed in the right hemithorax^{6,7,11}. Chest pain, dyspnea, cough, hemoptysis may be observed, hemothorax may occur in the affected hemithorax^{2,6}. The most common symptoms are pain and dyspnea⁸. The severity of the symptoms can vary from person to person and even during each pneumothorax period. It can sometimes be asymptomatic. Generally, findings observed in pneumothorax are detected in physical examination.

When evaluating the patient in terms of CP, the history of the disease (especially endometriosis), the frequency of pneumothorax and its relation with the menstrual cycle should be questioned. Although the pre-diagnosis is often made by clinical evaluations and anamnesis, the definitive diagnosis is made after anatomical or histopathological findings. Radiological imaging methods have an important role in diagnosis. While pneumothorax, lung nodule, pleural fluid (hemothorax), which are mostly indirect findings, can be observed with chest radiographs, tissues belonging to the endometrium can be detected in CT and especially MRI⁸. Active glandular tissues can be detected in T2-weighted images of MRI applied during menstruation¹². Although there is not a laboratory parameter for definitive diagnostic, it has been reported that it may be associated with serum Ca125 antigen level, but this parameter is not suitable for routine use^{6,7}.

There is no definitively accepted diagnosis-treatment algorithm for CP. Although important information can be obtained in terms of diagnosis

with anamnesis, physical examination and radiological imaging methods, surgical procedures may be required for definitive diagnosis. Care should be taken in the diagnosis about CP in young female sexed patients with a history of right-sided recurrent pneumothorax and endometriosis.

The main treatment strategies are surgical and medical-hormone therapies. Surgical treatment is more effective than hormone therapy ¹³. After surgical treatment recurrence rates are in the range of 14.3-55% ^{7,9}. It has been reported that a high success rate has been achieved in cases where surgical treatment and medical treatment are applied together ^{2,6,13}. Video-assisted thoracic surgery (VATS), one of the surgical methods, is a recommended method for both diagnosis and treatment ⁸. Its application especially during menstruation will increase the chance of detecting diaphragmatic lesions ¹. Surgical treatments are closure of diaphragm fenestrations, diaphragm plication or reconstruction, electrocoagulation or excision of endometriosis areas, chemical pleurodesis, wedge resection from the lung parenchyma, hysterectomy or bilateral oophorectomy. Medical treatment options are oral contraceptives, danazol, progesterone derivatives and GNRH analogues ^{2,8,11}. It is essential that thoracic surgeons, gynecologists and endocrinologists work together in the treatment of CP.

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