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Case Report of Catamenial Pneumothorax in 35-Year-Old Female and Literature Review

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Abstract

Catamenial pneumothorax is a rare condition characterized by recurrent spontaneous pneumothorax occurring in relation to menstruation. This case report presents the clinical history, diagnostic evaluation, and management of catamenial pneumothorax in a 35-year-old female. The purpose of this report is to highlight the clinical features and challenges associated with this condition and discuss the management strategies employed in this particular case.

Furthermore, we conducted an analysis of the last 10 years of case reports on 'catamenial pneumothorax' in PubMed, with the aim of comparing our clinical, anamnestic, and therapeutic data with the existing literature.

Case Presentation

A 35-year-old female presented to the emergency department with acute-onset right-sided chest pain and shortness of breath during her menstrual period. She reported a history of recurrent pneumothoraces that consistently occurred within 24 h to 48 h of the onset of menstruation. The patient experienced symptoms in a cyclical pattern over the past 2 years: The previous year, the patient had visited the Emergency Department twice due to a recurrent right pneumothorax, which necessitated Video-Assisted Thoracoscopic Surgery (VATS) with atypical resection of the right upper and middle lobes, accompanied by selective apical pleurodesis.

Physical examination revealed decreased breath sounds and dullness to percussion over the right lung base. No history of endometriosis was noted in the patient's anamnestic record.

Diagnostic evaluation

Initial evaluation included a chest X-ray, which confirmed the presence of a right-sided pneumothorax. Subsequent diagnostic investigations included a Computed Tomography (CT) scan of the chest, which revealed evidence of diaphragmatic fenestrations extending from the base of the right lung to the apex. At this point, correlating clinical and instrumental data, the suspicion of possible catamenial pneumothorax was raised. VATS (Video-Assisted Thoracoscopic Surgery) was then performed, and biopsy specimens were obtained from the diaphragm to confirm the diagnosis.

Management

Following the diagnosis of catamenial pneumothorax, the patient underwent surgical intervention. VATS was utilized to address diaphragmatic defects and remove endometrial implants. Intraoperatively, multiple diaphragmatic fenestrations and endometrial implants were visualized and meticulously excised. Postoperatively, hormonal therapy with oral contraceptives was initiated to suppress endometrial tissue growth. The only complication was the development of a sub-Glissonian hematoma at the liver site postoperatively, which, however, resolved during the hospitalization period. The patient experienced resolution of symptoms and has remained symptom-free during subsequent menstrual cycles.

Literature review

Searching on PubMed for 'Catamenial pneumothorax' and setting 'free full text' from 2014 to 2023, 84 results were available, out of which we selected 63 articles relevant for comparison with our case report, totaling 75 clinical cases of catamenial pneumothorax (Table 1). The average age of the analyzed patients was 35.2 years (minimum age 12 years - maximum age 48 years), consistent with our findings. From the collection of clinical symptoms, 88% of patients (66/75) experienced

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Table 1: PubMed for 'Catamenial pneumothorax' and setting 'free full text' from 2014 to 2023, 84 results were available, out of which we selected 63 articles relevant for comparison with our case report, totaling 75 clinical cases of catamenial pneumothorax.

Author	Age	Dyspnea	Pain	Cough	Emothisis	Endometriosis	RX	CT	Hernia	Vats	Drain	Pharmacy
Badawy et al. [1]	42	1				1	1					1
Baoquan et al. [2]	36	1	1			1	1		1	1		
Azizad et al. [3]	48		1					1			1	
Mowad et al. [4]	44	1				1	1			1		1
Kolos et al. [5]	32	1		1		1	1		1	1		
Barbosa et al. [6]	29	1				1	1	1		1		
Elia et al. [7]	38	1				1	1			1		1
Inoue et al. [8]	18	1				1	1			1		1
Ichiki et al. [9]	40	1				1	1		1	1		
Ichiki et al [9]	28	1				1		1		1		
Ichiki et al. [9]	34	1				1	1			1		1
Suwatanapongched et al. [10]	38				1		1	1				1
Suwatanapongched et al. [10]	25			1	1	1	1			1		1
Yu et al. [11]	48	1				1	1		1	1		1
Nemes et al. [12]	36	1				1	1			1		
Shikino et al. [13]	46	1	1			1	1			1		1
Takahashi et al. [14]	33	1	1			1	1			1		
Rosat et al. [15]	31	1				1	1			1		
Nair et al. [16]	40	1				1	1			1		1
Nair et al. [16]	36	1					1				1	
Nair et al. [16]	43	1		1		1	1				1	
Nair et al. [16]	34	1	1			1	1				1	
Nair et al. [16]	45	1				1	1			1		1
Nair et al. [16]	23	1				1	1		1	1		1
Yukumi et al. [17]	15	1	1				1				1	
Yukumi et al. [17]	20	1		1		1		1			1	1
Takahashi et al. [18]	37	1	1			1	1	1	1		1	
Aisa et al. [19]	42	1				1	1		1	1		1
Maniglio et al. [20]	37	1	1	1		1	1		1	1		1
Takahashi et al. [14]	33	1				1	1				1	
Pankratjevaite et al. [21]	36	1	1			1	1			1		
Maniglio et al. [22]	37	1	1			1	1	1		1		1
Narula et al. [23]	24	1	1			1	1				1	1
Junejo et al. [24]	30	1	1			1		1			1	
Leonardo et al. [25]	23				1	1		1			1	1
Okyere et al. [26]	25	1	1			1	1	1		1		
Kramer et al. [27]	14	1	1			1	1			1		1
Alaqeel et al. [28]	34	1				1				1		
Mukku et al. [29]	40	1		1		1	1		1	1		1
Hierink et al. [30]	34	1	1	1		1	1	1		1		1
Zhen et al. [31]	28				1		1			1		1
Low et al. [32]	36	1	1				1			1		1
Adesanya et al. [33]	37	1	1				1			1		1
Tsakiridis et al. [34]	41	1				1	1			1		1
Kaya et al. [35]	36		1		1	1		1		1		1
Sharma et al. [36]	31	1		1		1	1			1		1

Yamamoto et al. [37]	31	1	1				1			1		
Sampson et al. [38]	27	1					1			1		
Baram et at. [39]	12	1	1				1			1		
Adesanya et al. [33]	37	1	1				1			1		1
Kardaman et al. [40]	48	1				1	1		1	1		
Arakawa et al. [41]	43		1			1		1	1	1		1
Forster et al. [42]	47	1				1	1			1		1
Dong et al. [43]	43	1				1	1			1		1
Takigawa et al. [44]	46	1	1			1	1			1		1
Staring et al. [45]	37	1	1					1		1		1
Lameira et al. [46]	35	1	1				1					
Nguyen et al. [47]	31	1	1			1		1			1	1
Yu et al. [48]	35				1 Omb		1			1		1
Forster et al. [42]	47	1				1	1			1		1
Miedziarek et al. [49]	36	1	1			1	1			1		
Miedziarek et al. [49]	46	1					1			1		1
Miedziarek et al. [49]	40	1	1				1			1		
Mittal et al. [50]	37	1					1			1		1
Toffolo et al. [51]	40	1				1	1			1		
Kardaman et al. [40]	48	1	1		1	1		1		1		
Jacob et al. [52]	37	1	1			1		1		1		1
Koike et al. [53]	42	1	1			1	1			1		
Koike et al. [53]	40	1	1			1	1			1		
Chetambath al. [54]	43	1	1				1			1		
Pratomo et al. [55]	32	1	1			1	1			1		
Solanki et al. [56]	34	1					1			1		1
Ganesan et al. [57]	31	1			1	1				1		1
Rometti et al. [58]	38		1					1	1	1		1
Nguyen et al. [59]	21	1	1				1			1		1
		66	36	8	8	54	61	18	12	60	12	43

dyspnea/breathing difficulty, 48% (36/75) had right chest pain, while only 11% (8/75) had cough and another 11% (8/75) hemoptysis. It also appeared that in as many as 72% (54/75) of the cases, it was already known that the woman suffered from endometriosis. In 81% (61/75) of cases, the pneumothorax was diagnosed through a chest X-ray examination, and about 24% (18/75) of patients additionally underwent a chest CT for further/confirmatory diagnosis. Indeed, it was this latter examination that documented how 16% (12/75) also had right hepatic herniation in the pathological diaphragmatic tract. From the data analyzed, the importance of a diagnostic-therapeutic approach with VATS is evident, which was indeed used in 80% of the cases we analyzed (60/75), accompanied by thoracic drainage in 16% (12/75) of the cases. Finally, it emerges the necessity to combine this type of treatment with a hormonal pharmacological therapy to prevent possible recurrences, to which indeed 57% (43/75) of the patients we analyzed were subjected.

Discussion

According to the literature catamenial pneumothorax is a rare form of pneumothorax occurring in relation to menstruation. It is associated with the presence of endometrial tissue in the pleural cavity, typically due to diaphragmatic endometriosis.

The clinical presentation of catamenial pneumothorax can vary, but it typically features recurrent episodes in a cyclical pattern coinciding with menstruation. Our case appears similar to some described in the literature, in terms of age and clinical presentation [40,41,51,59]. The diagnosis relies on a combination of clinical suspicion, radiological imaging, and histopathological examination. Surgical intervention, such as VATS, is often necessary for both diagnosis and treatment [56-61].

It is important to emphasize that in our case, and regrettably in some cases reported in the literature, the pneumothorax observed on the initial radiographic examination during the first visit to the Emergency Department was underestimated, and the potential underlying cause was not investigated. This oversight allowed for the subsequent development of new recurrences.

Hormonal therapy, such as the use of oral contraceptives, may be employed to suppress the growth of endometrial tissue and reduce the risk of recurrence, as widely suggested in the literature and evidenced by numerous clinical cases we have reported [62,63].

Conclusion

This case report highlights the clinical presentation, diagnostic evaluation, and management strategies employed in a case of catamenial pneumothorax. Increased awareness of this condition is essential for early recognition and appropriate management. Further research is needed to better understand the pathogenesis and optimize treatment options for this rare condition.

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