

Puffy Hand Syndrome with Pneumonia and Spontaneous Pneumothorax in an Intravenous Drug User: A Case Report

Liudmyla Shostakovych-Koretska

Infectious Diseases Department of Dnipro Municipal Hospital №4, Dnipro State Medical University, Dnipro, Ukraine
Email: shost3@gmail.com

How to cite this paper: Shostakovych-Koretska, L. (2025) Puffy Hand Syndrome with Pneumonia and Spontaneous Pneumothorax in an Intravenous Drug User: A Case Report. *Case Reports in Clinical Medicine*, 14, 64-69.

<https://doi.org/10.4236/crcm.2025.142008>

Received: January 7, 2025

Accepted: February 10, 2025

Published: February 13, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Background: Puffy hand syndrome (PHS) is a rare complication primarily associated with intravenous drug use (IVDU), characterized by chronic swelling and fibrosis of the hands due to lymphatic damage. Concurrent pulmonary complications, such as pneumonia and pneumothorax, significantly contribute to increased morbidity in this population. **Case Presentation:** We report the case of a 28-year-old female who injects drugs, and presents with fever, bilateral hand edema, and respiratory symptoms. Clinical evaluation revealed erythema and edema of both hands, elevated inflammatory markers, and a left lower lobe infiltration that progressed to pneumothorax. A diagnosis of PHS and left lower lobe pneumonia complicated by pneumothorax was established. **Management and Outcomes:** The patient was treated with broad-spectrum antibiotics, including ceftriaxone, levofloxacin, dexamethasone, and oxygen supplementation, as well as antipyretics. She demonstrated partial clinical improvement and was referred to another hospital's thoracic surgery department for specialized care. **Conclusions:** This case underscores the importance of early recognition and multidisciplinary management of rare but serious complications in IVDU patients. Further research is necessary to elucidate the interplay between lymphatic dysfunction and pulmonary pathophysiology in this demographic.

Keywords

Puffy Hand Syndrome, Intravenous Drug Use, Pneumonia, Spontaneous Pneumothorax, Lymphatic Dysfunction

1. Introduction

Puffy hand syndrome is characterized by chronic swelling (edema) of the hands

and fingers. It is often associated with long-term intravenous drug use, especially among people who inject drugs into veins in their hands or arms [1] [2]. Repeated injections can damage the lymphatic system, which drains excess fluid from tissues. This damage leads to persistent swelling, fibrosis (thickening or scarring of tissue), and reduced mobility in the hands [2] [3]. While usually not painful, it can cause discomfort, stiffness, and functional impairment. Key indicators of puffy hand syndrome in people who inject drugs (PWID) include bilateral swelling of the hands, associated redness and puffiness, and a history of intravenous drug use [2]. Although puffy hand syndrome is most commonly associated with intravenous drug use, other factors can contribute to this condition, such as cellulitis, allergic reactions, lymphedema (not related to drug use), thrombophlebitis, rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), heart failure, and hypothyroidism [1] [3]. Pulmonary complications associated with intravenous drug use include pneumonia, septic embolization, noncardiogenic pulmonary edema, interstitial lung disease, pneumothorax, and asthma [4] [5]. Intravenous drug users (IVDU) have a 10-fold increased risk of community-acquired pneumonia (CAP) compared to the general population [4] [5]. The organisms most commonly causing CAP in this population include *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenzae*, and *Klebsiella pneumoniae* [5] [6]. Initial antibiotic regimens target these pathogens when patients present with typical symptoms of bacterial pneumonia with focal consolidation on chest radiograph. The management of pneumothorax includes prompt recognition and treatment with chest tube insertion, as well as appropriate antibiotic therapy.

We present a case that combines two rare conditions: Puffy Hand Syndrome and pneumonia with pneumothorax in a non-HIV-positive female intravenous drug user. This highlights the clinical significance and possible interplay between these conditions.

2. Case Description

A 28-year-old woman was admitted to the ICU of Dnipro Municipal Infectious Diseases Clinic with a 4-day history of fever, weakness, dry cough, and swelling and redness of her hands. She reported no chronic medical conditions or recent illnesses but had a history of intravenous substance abuse and a prior pneumonia diagnosis a year earlier. Her last intravenous drug use was two days before admission, with injections routinely administered into the dorsal sides of her hands, forearms, and groin. Upon admission, the patient was febrile (37.8°C), weak, and in moderate distress. Her vital signs were pulse rate 100 beats/min, respiratory rate 18 breaths/min, blood pressure 120/85 mmHg, and oxygen saturation (SpO₂) 95% on room air. On auscultation, abnormal breath sounds with rales and rhonchi were noted in the left lower lung. There were no cardiac murmurs or rhythm abnormalities. Cutaneous examination revealed erythema and edema of her hands starting from the wrists to the dorsal surfaces and fingers bilaterally. The edema caused a sensation of tension but was not associated with pain (Figure 1). There was no clinical evidence of joint inflammation or thrombophlebitis.



Figure 1. The image shows cutaneous signs of puffy hand syndrome with erythema and edema of the bilateral hands and fingers.

Laboratory results showed a high white cell count (26,700/ μ L), and elevated C-reactive protein (174.3 mg/L). She has a positive rheumatoid factor and slightly increased ASO. Tests for autoimmune conditions were inconclusive and did not support an autoimmune diagnosis. Two blood cultures returned negative results, as did tests for SARS-CoV-2 and HIV. The echocardiogram didn't show the presence of vegetation. Tuberculosis was also considered and ruled out during the examination, and blood cultures, as well as tests for SARS-CoV-2, HIV, and tuberculosis, were negative.

Initial chest X-ray revealed patchy increased density in the left lower lobe (**Figure 2(A)**). A presumptive diagnosis of Left lower lobe pneumonia and Puffy hand syndrome due to IVDU was made. Currently, there are no medications available for treating this syndrome. Management should focus on addressing any infections and permanently discontinuing intravenous drug administration, as well as mechanical factors contributing to lymphatic damage [1]-[3]. The patient was treated with broad-spectrum antibiotics, including ceftriaxone, levofloxacin, dexamethasone, and oxygen supplementation, as well as antipyretics. She demonstrated partial clinical improvement and was referred to another hospital's thoracic surgery department for specialized care.

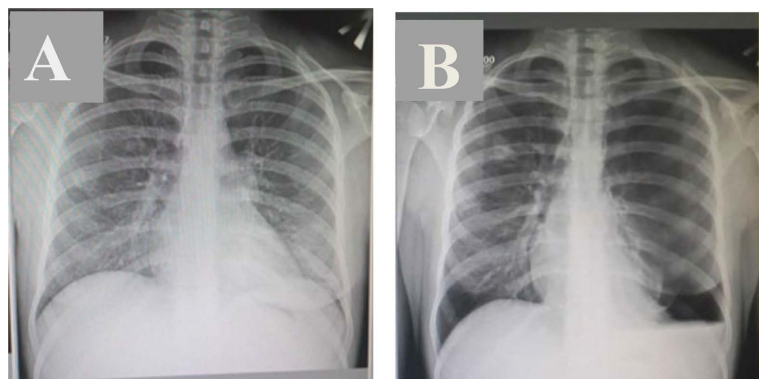


Figure 2. Chest radiograph shows left low lobe infiltration (A). Image (B) studies on the 12th day of admission show left-sided spontaneous pneumothorax.

Her overall condition showed improvement, and the edema and redness in her hand were subsiding; however, she continued to experience subfebrile symptoms. On day 10 of her admission, follow-up chest X-rays revealed the development of a new left-sided spontaneous pneumothorax (Figure 2). Consequently, she was consulted by a thoracic surgeon and referred to another hospital's thoracic surgery department for specialized care.

3. Discussion

This case demonstrates the rare coexistence of puffy hand syndrome and pneumonia complicated by asymptomatic pneumothorax in a long-term intravenous drug user. Puffy hand syndrome, is an uncommon manifestation of IVDU, likely resulting from lymphatic damage secondary to repeated injections, drug toxicity, and poor aseptic technique [1] [2]. The evidence highlights the role of contaminants in injected substances contributing to PHS pathogenesis [3]. Hematogenous pneumonia or septic pulmonary infarcts in intravenous drug users result from recurrent emboli of infected material, which typically contains various Gram-positive and Gram-negative organisms [4]. Zha *et al.* [7] emphasize the importance of prophylactic antibiotics in preventing ventilator-associated pneumonia in high-risk populations, insights that may inform management strategies for IVDU.

This case demonstrates the rare coexistence of PHS, and pneumonia complicated by pneumothorax in a long-term intravenous drug user. Damage to the veins, injury to the lymphatic system, and the toxicity of injectable drugs to the vascular structures, along with poor aseptic technique, are believed to contribute to the pathogenesis of puffy hand syndrome [1]-[3]. Contaminants in injected substances may exacerbate lymphatic dysfunction, leading to fibrosis and chronic edema [8].

Pneumonia complicated by pneumothorax is an uncommon but serious complication among individuals who engage in intravenous drug use (IVDU). It is commonly associated with right-sided valvular vegetation due to infective endocarditis [4]-[6], but it is noteworthy that no signs of endocarditis or valvular vegetation were observed in this patient. While *Staphylococcus aureus*, streptococcal species, and enterococci are commonly implicated pathogens, no specific organisms were isolated in this case. The role of autoimmune mechanisms in lung damage and pneumothorax, as well as their potential connection to puffy hand syndrome, remains an area for further investigation [9] [10]. The injected substances and contaminants, along with immune dysregulation, contribute to the increased vulnerability of the lungs in this population. Recent research indicates that lymphatic dysfunction and immune dysregulation are critical factors in the development of pulmonary complications related to IVDU [11] [12]. The underlying mechanisms may include localized inflammation, immune-mediated damage, and the obstruction of lymphatic or pulmonary drainage pathways. Moreover, contaminants present in injected substances can directly damage lung tissues and intensify immune responses. Tomaszewski, J. F. and colleagues [11] identified

microvascular damage caused by repeated injections as a contributor to pulmonary complications., while Piepenbrink M. S. *et al.* [12] highlighted the role of chronic inflammation in driving systemic complications in intravenous drug users. Pneumothorax is a potentially life-threatening complication of septic pulmonary embolism, particularly in individuals who use intravenous drugs [13]. It should be considered in patients admitted to the hospital for pneumonia, even if they do not have right-sided valvular vegetation or infective endocarditis, as demonstrated in this case. This situation underscores the necessity for a comprehensive diagnostic approach. Clinicians should maintain a high index of suspicion for the development of pneumothorax in patients with a history of intravenous drug use or pre-existing lung disease [14]. Additional research is necessary to gain a better understanding of the pathophysiology and optimal management of this rare complication. To establish a connection between these conditions and intravenous drug use (IVDU), it is crucial to exclude other autoimmune mechanisms or infectious causes. Furthermore, this case highlights the importance of integrated care, which should include addiction specialists, infectious disease experts, and thoracic surgeons

4. Conclusion

This case highlights the importance of recognizing the rare complications associated with intravenous drug use. Early diagnosis and appropriate treatment of conditions such as puffy hand syndrome and pneumonia with pneumothorax can improve outcomes. General practitioners and addiction medicine specialists should maintain a heightened awareness of these complications to provide timely and effective care. Further research is necessary to elucidate the pathophysiological mechanisms linking these complications in IVDU patients.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

- [1] Chouk, M., Vidon, C., Deveza, E., Verhoeven, F., Pelletier, F., Prati, C., *et al.* (2017) Puffy Hand Syndrome. *Joint Bone Spine*, **84**, 83-85. <https://doi.org/10.1016/j.jbspin.2016.05.001>
- [2] Cohen, P.R. (2024) Injected Drug Addiction-Associated Swollen Hands: A Case Report of Methylamphetamine-Related Unilateral Drug Addiction-Related Puffy Hand Syndrome. *Cureus*, **16**, e51545. <https://doi.org/10.7759/cureus.51545>
- [3] Majeed, I. and VanDyke, K. (2024) Puffy Hand Syndrome: A Case Report. *Journal of Urgent Care Medicine*, **19**, 25-27.
- [4] Hind, C.R. (1990) Pulmonary Complications of Intravenous Drug Misuse. 2. Infective and HIV Related Complications. *Thorax*, **45**, 957-961. <https://doi.org/10.1136/thx.45.12.957>
- [5] Mégarbane, B. and Chevillard, L. (2013) The Large Spectrum of Pulmonary Complications Following Illicit Drug Use: Features and Mechanisms. *Chemico-Biological*

- Interactions*, **206**, 444-451. <https://doi.org/10.1016/j.cbi.2013.10.011>
- [6] Salunkhe, V., Peyrani, P., Beavin, L., Furmanek, S. and Ramirez, J. (2018) Characteristics and Clinical Outcomes of Hospitalized Patients with Community-Acquired Pneumonia Who Are Active Intravenous Drug Users. *Journal of Respiratory Infections*, **2**, 7-11. <https://doi.org/10.18297/jri/vol2/iss2/3>
- [7] Zha, S., Niu, J., He, Z., Fu, W., Huang, Q., Guan, L., *et al.* (2023) Prophylactic Antibiotics for Preventing Ventilator-Associated Pneumonia: A Pairwise and Bayesian Network Meta-Analysis. *European Journal of Medical Research*, **28**, Article No. 348. <https://doi.org/10.1186/s40001-023-01323-z>
- [8] Pieper, B.A. and Templin, T.N. (2001) Chronic Venous Disorders and Intravenous Drug Use. *Substance Use & Misuse*, **36**, 895-906.
- [9] Barton, M. and Fett, N. (2020) Red Puffy Hand Syndrome Mistaken for Inflammatory Arthritis. *Dermatology Online Journal*, **26**, 4-7. <https://doi.org/10.5070/d3266049321>
- [10] Rello, J. and Popov, D.V. (2013) Community-Acquired Pneumonia in Drug Users: Clinical and Management Strategies. *International Journal of Infection*, **1**, 139-148.
- [11] Tomashefski, J.F. and Hirsch, C.S. (1980) The Pulmonary Vascular Lesions of Intravenous Drug Abuse. *Human Pathology*, **11**, 133-145. [https://doi.org/10.1016/s0046-8177\(80\)80130-4](https://doi.org/10.1016/s0046-8177(80)80130-4)
- [12] Piepenbrink, M.S., Samuel, M., Zheng, B., Carter, B., Fucile, C., Bunce, C., *et al.* (2016) Humoral Dysregulation Associated with Increased Systemic Inflammation among Injection Heroin Users. *PLOS ONE*, **11**, e0158641. <https://doi.org/10.1371/journal.pone.0158641>
- [13] Montano, M., Lee, K., Patel, K. and Kioka, M. (2021) Septic Pulmonary Embolism Causing Recurrent Pneumothorax in an Intravenous Drug User without Right-Sided Valvular Vegetation in Infective Endocarditis. *Case Reports in Critical Care*, **2021**, 1-3. <https://doi.org/10.1155/2021/7050775>
- [14] Krawczyk, M., Chajec, J., Paluch, Z., Michalczyk, J., Miłosz, A. and Szczukocka, M. (2024) Pneumothorax as a Complication of Respiratory Failure—Two Case Reports and Literature Review. *Journal of Pre-Clinical and Clinical Research*, **18**, 139-146. <https://doi.org/10.26444/jpccr/188770>