RESEARCH PAPER

The Lung as a Diagnostic Window: Rare Multisystem Disorders Presenting with Respiratory Disease- A Case Series

[1]Dr.RP Sucharitha, [2]Dr.P Mahashree Shobika, [3]Dr.S Subramanian, [4]Dr.S Nagarjun
1 MBBS, ORCID- 0009-0004-4890-361X, Email ID- sucharithapriyakumar@gmail.com
2MBBS, ORCID- 0009-0008-7783-6072Email ID- mp8943@srmist.edu.in
[3]MD (Respiratory Medicine), Professor, ORCID- 0000-0002-3943-4880, Email ID- subramas1@srmist.edu.in
[4]MD (Respiratory medicine), Assistant Professor, ORCID- Orchid ID 0009 0008 4462 5359, Email ID- nagarjus@srmist.edu.in
[1,2,3,4]Department of Respiratory medicine, SRM Medical College Hospital and Research Centre, Kattankulathur, Chennai.

ABSTRACT
Pulmonary complaints may occasionally represent the first clue to an underlying multisystem syndrome. We describe three patients in whom respiratory disease led to recognition of rare systemic disorders: a developmental lymphatic anomaly presenting with chylothorax, Turner syndrome presenting with pneumothorax/emphysematous changes and cardiovascular anomalies, and autoimmune polyglandular syndrome type 1 presenting with bronchiectasis and hemoptysis. Chylothorax was supported by milky pleural fluid and triglyceride level >110 mg/dL, a commonly accepted diagnostic threshold [1–3]. Turner syndrome was confirmed by mosaic 45,X karyotype and supported by typical dysmorphic, gonadal, and cardiovascular features [4–6]. APS-1 was suspected based on autoimmune endocrine involvement and pulmonary disease after exclusion of tuberculosis; lung involvement in APS-1/APECED is rare but increasingly recognized, with bronchiectasis described as an important radiologic pattern [7–9].

KEYWORDS: Chylothorax; primary lymphatic anomaly; Turner syndrome; pneumothorax; emphysema; bronchiectasis; autoimmune polyglandular syndrome type 1; pulmonary manifestations; case series .

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Introduction

Respiratory symptoms such as dyspnea, pleural effusion, pneumothorax, chronic cough, bronchiectasis, and hemoptysis are usually investigated as primary pulmonary disorders. However, in young patients with atypical clinical features or recurrent unexplained disease, the lung may act as a window to an underlying syndromic, developmental, or autoimmune condition.

Chylothorax is classically diagnosed by pleural fluid triglyceride level >110 mg/dL or demonstration of chylomicrons, though nutritional status and borderline values may complicate interpretation [1–3]. Turner syndrome is associated with short stature, gonadal dysgenesis, and cardiovascular anomalies, especially bicuspid aortic valve and coarctation of the aorta [4,5]. Pulmonary abnormalities such as emphysema, bullous disease, pneumothorax, and bronchiectasis are rare but reported in Turner syndrome [6,10]. APS-1/APECED is caused by AIRE-related immune dysregulation and classically includes chronic mucocutaneous candidiasis, hypoparathyroidism, and adrenal insufficiency; pulmonary autoimmunity and bronchiectasis are uncommon but clinically important [7–9].

Case Presentations

Case 1: Developmental Lymphatic Anomaly Presenting with Chylothorax

A 17-year-old male presented with fever, right-sided pleuritic chest pain, cough with expectoration, loss of appetite, and weight loss. He had a history of non-pitting edema of the right upper and lower limbs since childhood, gradually progressive and static over the preceding year. Examination revealed pallor and non-pitting edema of the right upper and lower limbs (Figure 1). Respiratory examination showed signs of right-sided pleural effusion.

Chest radiograph and ultrasound confirmed right pleural effusion (Figure 2). Pleural fluid was milky and turbid, with protein 22 g/L, LDH 1584 IU/L, triglyceride 151 mg/dL, cholesterol 30 mg/dL, ADA 44 U/L, and negative microbiological evaluation including AFB and TruNAAT. A triglyceride level above 110 mg/dL supports chylothorax in the appropriate clinical context [1–3].

Lymphoscintigraphy demonstrated significant lymphatic obstruction in the right upper and lower limbs, partial obstruction in the left upper limb, and no definite obstruction in the left lower limb (Figure 3). Arterial and venous Doppler studies were normal. The patient was managed with antibiotics, oxygen, thoracentesis, and later pigtail catheter drainage following sudden respiratory deterioration. The overall clinical picture was consistent with a primary developmental lymphatic anomaly associated with chylothorax.

Case 2: Turner Syndrome Presenting with Pneumothorax and Emphysematous Lung Changes

A 19-year-old female presented with progressive

breathlessness for one year, corresponding to MMRC grade 3–4, and menstrual irregularity. Examination revealed short stature, low-set ears, webbed neck, absent axillary hair, pallor, and a pansystolic murmur. Chest radiograph showed right pneumothorax (Figure 4), with post-intercostal drainage chest radiograph demonstrating resolution of pneumothorax (Figure 5). CT chest showed mild right pneumothorax, right pleural effusion with collapse-consolidation, fibrotic bands, and paraseptal emphysematous changes (Figures 7 and 8).

Echocardiography revealed preductal coarctation of the aorta with a peak gradient of 72 mmHg, bicuspid aortic valve with mild aortic stenosis/aortic regurgitation, left ventricular hypertrophy, and persistent left superior vena cava. CT aortogram confirmed coarctation with multiple collateral vessels (Figure 6). Ultrasound abdomen showed bilaterally small ovaries consistent with gonadal dysgenesis. Karyotyping showed mosaicism 45,X, confirming Turner syndrome.

Coarctation of the aorta and bicuspid aortic valve are recognized cardiovascular associations in Turner syndrome [4,5]. Pulmonary manifestations such as emphysematous/bullous changes, pneumothorax, and bronchiectasis are uncommon but have been reported [6,10]. In this case, pulmonary symptoms were the presenting feature that led to recognition of the underlying genetic syndrome.

Case 3: Autoimmune Polyglandular Syndrome Type 1 with Bronchiectasis and Hemoptysis

A 21-year-old male presented with hemoptysis for two days, chronic cough with expectoration and intermittent dyspnea for eight years, recurrent hospitalizations, weight loss, anorexia, and diffuse hyperpigmentation of skin and oral mucosa (Figures 9 and 10). Routine biochemical evaluation showed hyponatremia and hyperkalemia. Endocrine evaluation revealed low serum cortisol with elevated ACTH, decreased parathormone level, and hypothyroidism.

Sputum AFB smear, TruNAAT, and culture were negative for tuberculosis. CT chest demonstrated cystic bronchiectatic changes with interlobular septal thickening involving the anterior segment of the right upper lobe, anterior basal segment of the right lower lobe, and lingular segment of the left upper lobe (Figure 11).

The constellation of primary adrenal insufficiency, hypoparathyroidism, hypothyroidism, hyperpigmentation, and chronic pulmonary disease supported APS-1/APECED-spectrum autoimmune polyendocrinopathy. APS-1 is classically associated with AIRE mutation and the triad of chronic mucocutaneous candidiasis, hypoparathyroidism, and adrenal insufficiency [7,8]. Pulmonary autoimmunity in APS-1 is rare, but bronchiectasis has been described as an important radiologic pattern [9].

Discussion

This case series demonstrates three different mechanisms by which systemic disease can present as respiratory illness: lymphatic obstruction causing chylothorax, genetic gonadal dysgenesis with cardiovascular and pulmonary complications, and autoimmune endocrine disease associated with bronchiectasis and hemoptysis.

In Case 1, childhood-onset unilateral non-pitting edema and abnormal lymphoscintigraphy supported a primary lymphatic developmental disorder. In the absence of trauma, thoracic surgery, malignancy, or definite infection, primary lymphatic anomaly becomes an important diagnostic consideration. The pleural fluid triglyceride level of 151 mg/dL, along with milky appearance, supported chylothorax [1–3].

In Case 2, pulmonary findings led to recognition of Turner syndrome. The diagnosis was supported by short stature, webbed neck, gonadal dysgenesis, coarctation of the aorta, bicuspid aortic valve, persistent left superior vena cava, and mosaic 45,X karyotype. While cardiovascular abnormalities are well established in Turner syndrome, pulmonary manifestations are less frequently emphasized [4–6,10].

In Case 3, chronic respiratory symptoms initially mimicked infection, particularly tuberculosis, which is a common diagnostic consideration in patients with chronic cough, weight loss, and hemoptysis. However, repeated negative microbiological evaluation and the presence of adrenal insufficiency, hypoparathyroidism, and hypothyroidism redirected the diagnosis toward APS-1/APECED-spectrum disease [7–9].

The common diagnostic lesson across all three cases is that recurrent, atypical, or disproportionate pulmonary disease in young patients should trigger careful examination for extrapulmonary clues. Dysmorphism, endocrine dysfunction, congenital cardiovascular disease, lymphatic abnormalities, and recurrent unexplained illness should not be treated as incidental findings.

Conclusion

Pulmonary disease may be the presenting clue to rare multisystem syndromes. This case series highlights developmental lymphatic anomaly presenting with chylothorax, Turner syndrome presenting with pneumothorax/emphysematous lung changes, and APS-1/APECED-spectrum disease presenting with bronchiectasis and hemoptysis. Careful systemic examination, targeted imaging, endocrine evaluation, lymphatic assessment, and genetic confirmation where appropriate are essential to avoid diagnostic delay and incomplete management.

Declarations

Patient Consent

Written informed consent obtained from all patients or their legal guardians for publication of clinical details and images.

Conflicts of Interest

The authors declare no conflicts of interest.

References

1. McGrath EE, Blades Z, Anderson PB. Chylothorax: aetiology, diagnosis and therapeutic options. Respir Med. 2010;104(1):1–8.
2. Maldonado F, Hawkins FJ, Daniels CE, Doerr CH, Decker PA, Ryu JH. Pleural fluid characteristics of chylothorax. Mayo Clin Proc. 2009;84(2):129–133.
3. Bhatnagar R, Maskell N. Non-traumatic chylothorax: diagnostic and therapeutic strategies. Breathe. 2022;18:210163.
4. Khan M, et al. Association of coarctation of aorta with Turner syndrome: a case report. Front Pediatr. 2025;13:1607621.
5. Ribé L, et al. Outcomes of cardiothoracic surgery in women with Turner syndrome. Ann Cardiothorac Surg. 2023;12(6):555–564.
6. de Sousa AM, et al. Pulmonary emphysema in a patient with Turner's syndrome. Rev Port Pneumol. 1992.
7. Bello MO, Garla VV. Polyglandular Autoimmune Syndrome Type I. StatPearls. Treasure Island (FL): StatPearls Publishing; updated 2023.
8. Zainab K, et al. Autoimmune Polyglandular Syndrome Type 1: A Report of Two Cases and Review. Cureus. 2022;14(8):e28092.
9. Silani MS, et al. Bronchiectasis in a patient with Autoimmune Polyendocrinopathy-Candidiasis-Ectodermal Dystrophy: a case report. BMC Pulm Med. 2024;24:441.
10. Almoshantaf MB, et al. A rare coincidence of Turner syndrome and bronchiectasis. Respir Med Case Rep. 2022;38:101687

Legends:

Figure 1: Non-pitting edema of the right upper and lower limb.
Figure 2: Chest X-ray showing right pleural effusion.
Figure 3: Significant lymphatic obstruction in the right upper and lower limbs and partial lymphatic obstruction in the left upper limb.
Figure 4: Right pneumothorax
Figure 5: Post-ICD chest X-ray with resolution of pneumothorax.
Figure 6: Preductal coarctation of the aorta.
Figure 7: Right primary spontaneous pneumothorax.
Figure 8: Bilateral paraseptal emphysematous changes.
Figure 9: Hyperpigmentation of skin.
Figure 10: Hyperpigmentation of oral mucosa..
Figure 11: Central bronchiectasis.

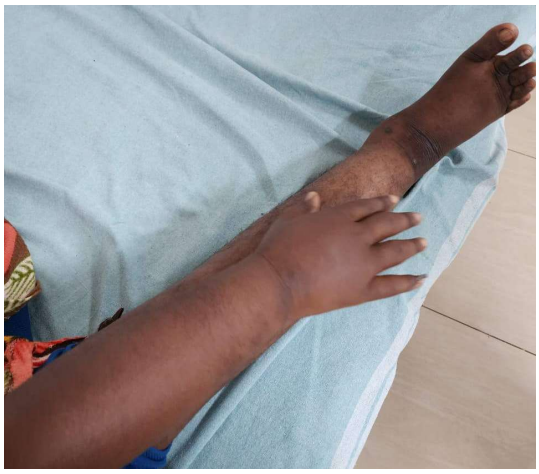

Figure 1: Non-pitting edema of the right upper and lower limb.

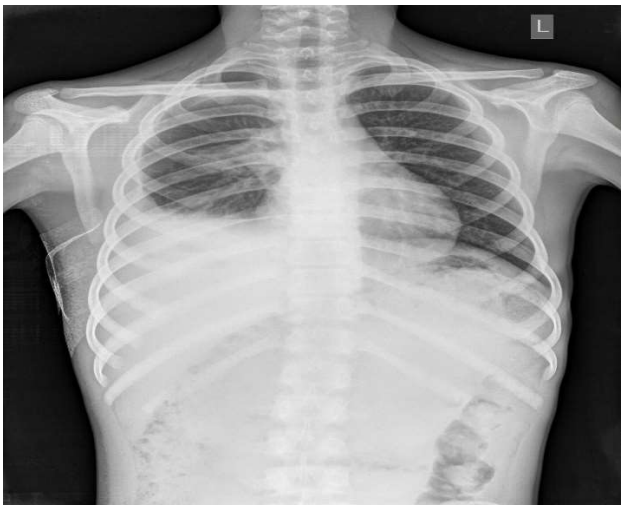

Figure 2: Chest X-ray showing right pleural effusion.

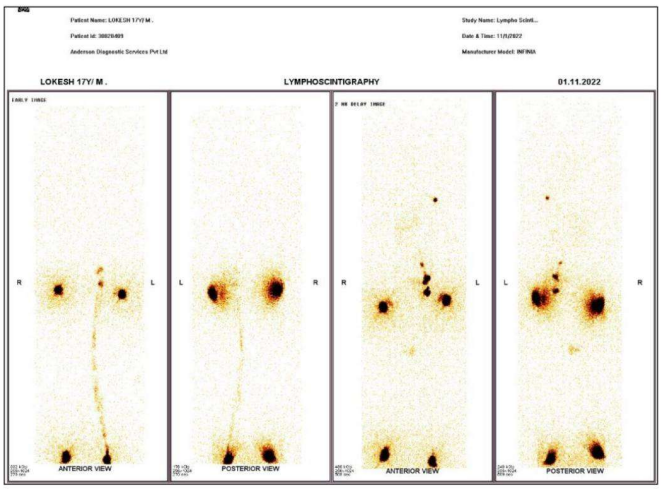

Figure 3: Significant lymphatic obstruction in the right upper and lower limbs and partial lymphatic obstruction in the left upper limb.

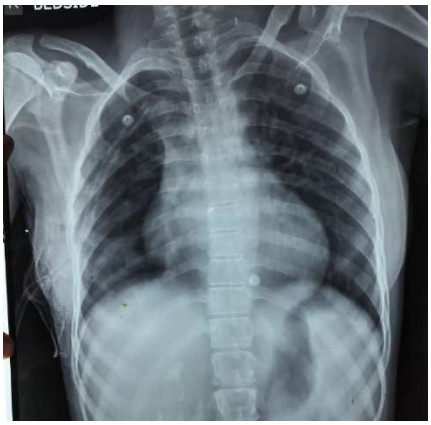

Figure 4: Right pneumothorax.

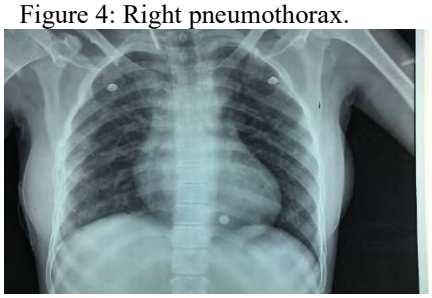

Figure 5: Post-ICD chest X-ray with resolution of pneumothorax.

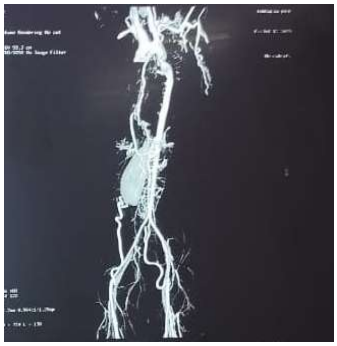

Figure 6: Preductal coarctation of the aorta.

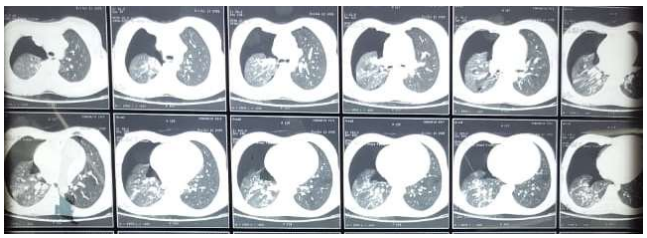

Figure 7: Right primary spontaneous pneumothorax.

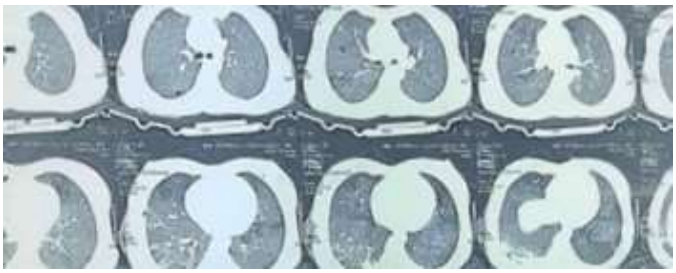

Figure 8: Bilateral paraseptal emphysematous changes.

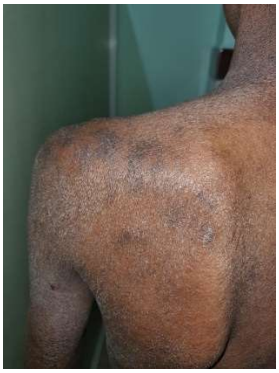

Figure 9: Hyperpigmentation of skin.

Figure 10: Hyperpigmentation of oral mucosa.

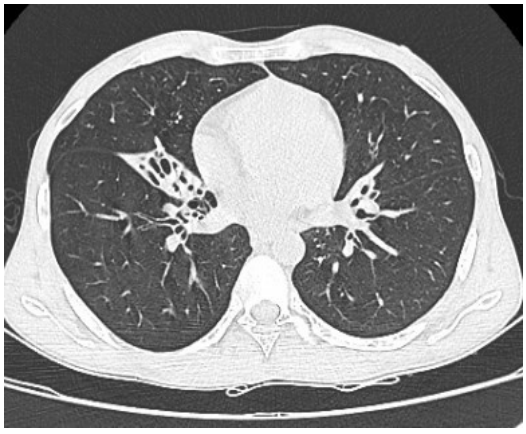

Figure 11: Central bronchiectasis.