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CASE REPORT

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Systemic sclerosis-associated interstitial lung disease in a Vietnamese adult female: Case report and literature review

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Abstract

Systemic sclerosis-associated interstitial lung disease (SSc-ILD) is a rare disease in the Asian population and might be overlooked in clinical practice. Early diagnosis is crucial to initiate treatment and to prevent disease progression. Chest high-resolution computed tomography (HRCT) is the modality of choice for diagnosing and assessing this disorder. SSc-ILD should be included in the list of differential diagnoses of ILD. Familiarity with HRCT findings and thorough clinical examination are crucial for diagnosis and treatment.

KEYWORDS
high-resolution computed tomography, interstitial lung disease, systemic sclerosis

INTRODUCTION

Systemic sclerosis (SSc) is characterized by microvascular damage and generalized fibrosis in the skin and visceral organs.[1–3] This is a rare disease, with an estimated global prevalence of 3–24 per 100,000.[4] The pooled prevalence estimate in Asia is 6.8 per 100,000.[3] Lung fibrosis occurs in approximately 80% of patients with SSc; 25%–30% develop progressive interstitial lung disease (ILD),[2] which is a leading cause of morbidity and mortality, with a 10-year mortality of up to 40%.[1]

Early diagnosis of SSc-ILD is crucial to initiate treatment and to prevent disease progression. However, this is often challenging due to non-specific clinical manifestations such as dyspnoea, cough, chest pain and exercise limitation.[5] High-resolution computed tomography (HRCT) of the chest is recognized as a sensitive imaging method for diagnosing and assessing SSc-ILD.[5,6] We herein describe the radiological findings of SSc-ILD in a young Vietnamese woman. To the best of our knowledge, this is the first detailed case report describing the clinical presentation and HRCT findings of a patient with SSc-ILD in the country. This case aims to raise awareness of this rare entity for practicing radiologists where national data are still lacking.

CASE REPORT

A 30-year-old non-smoker female presented with repeated episodes of haemoptysis for 1 month. She had a history of known SSc for 15 years and has been on oral low-dose prednisolone (4 mg/day). The recent clinical manifestations included intermittent non-productive cough, shortness of breath, dysphagia and anorexia. She denied any signs of chest pain. She had typical facial features of SSc, including loss of cutaneous elasticity, tightness, thickening and hardening of the skin. Telangiectasia in the face was also observed (Figure 1A). Pitted scarring and tapering of fingertips were also noticed. The nails were curled and diminished in size. Digital contractures, dry gangrene and digital ulcers

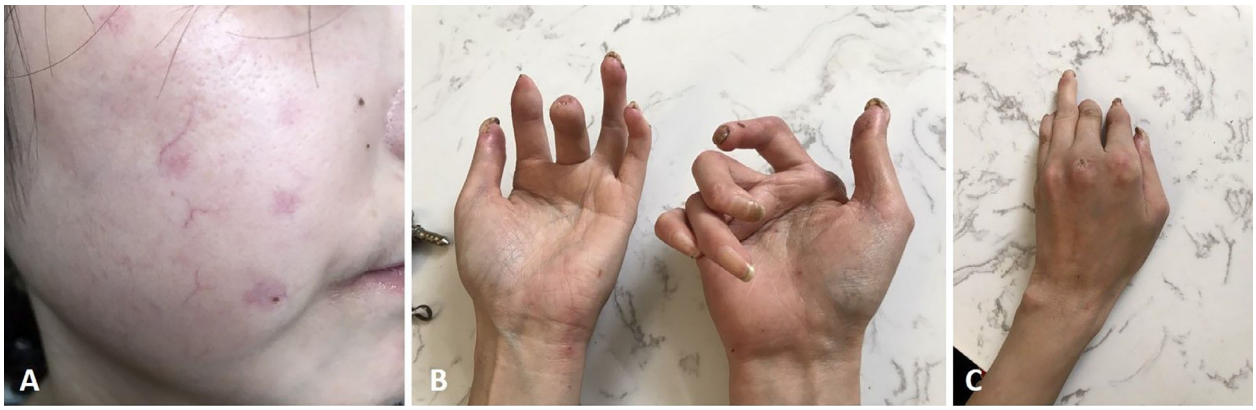

FIGURE 1 Clinical examination. (A) Telangiectasia. (B) Sclerodactyly and claw-shaped fingers. (C) Digital ulcer, flexion contractures and dry gangrene

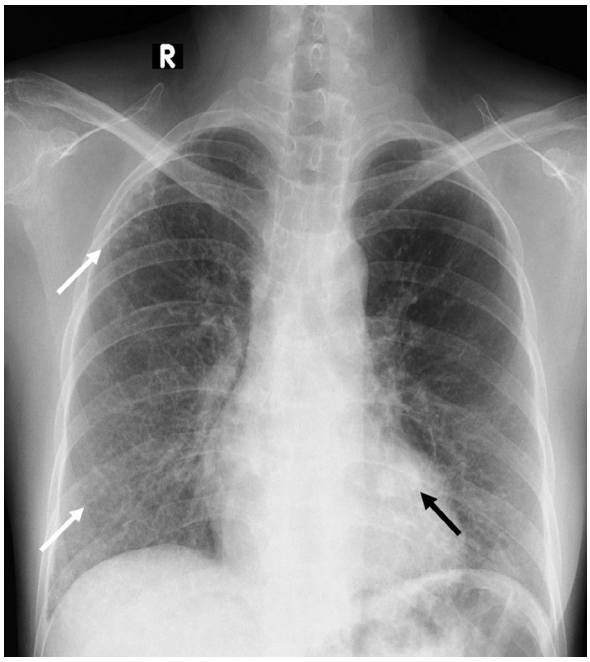

FIGURE 2 Chest x-ray (posteroanterior view) revealed a well-defined homogeneous opacity in the left lower lung zone (black arrow). Extensive reticular opacity and honeycombing (white arrows) involving both uppers and lower zones were also noted

were seen (Figure 1B,C). Bronchoscopy showed diffuse dilatation of the bronchi up to the fifth-order segmental bronchi, without mucoid impaction or blood clot. Bronchoalveolar lavage cytology was performed but the results were negative for tuberculosis and aspergillosis. Other laboratory examinations were within a normal range.

A chest x-ray revealed a well-defined mass opacity in the left lower lobe in a background of extensive lower zones predominant reticular opacities. These findings were consistent with an ILD (Figure 2). Other suggestive findings of SSc-ILD such as diminished lung volume, cardiomegaly and pulmonary hypertension, deviated oesophageal line and superior rib notching sign were all absent.

HRCT images showed diffuse reticular opacities, ground-glass opacity (GGO), extensive bilateral honeycombing and traction bronchiectasis predominantly in the bilateral subpleural lower and middle lung zones. Several subpleural cysts were also seen (Figure 3). Notably, a pulmonary cavity with an internal rounded mass with Monod sign was found at the left lower lobe suggesting a fungal ball (Figure 4). Oesophageal dilation in the 2/3 lower segment without mural thickening or fat stranding was an additional finding (Figure 5). These features were compatible with SSc-ILD and non-specific interstitial pneumonia (NSIP) pattern. HRCT confirmed no dilation of the pulmonary trunk. This patient was kept on treating with prednisolone and antifungal drugs (ketoconazole 500 mg twice daily) and her clinical condition improved significantly during follow-up.

DISCUSSION

In the setting of known SSc, HRCT findings of ILD, particularly NSIP pattern, are compatible with SSc-ILD. Chest x-ray is usually the initial imaging modality. Except for extensive reticular opacity involving both uppers and lower zones, predominant in lung bases, the other findings such as low lung volumes, interstitial prominence or thickening, cardiomegaly with or without pericardial effusions, pleural effusions, enlargement of the pulmonary arteries and mediastinal lymphadenopathy were non-specific.[1]

HRCT is the modality of choice in the evaluation of SSc-ILD. Commonly, there are two patterns of lung fibrosis in SSc-ILD, NSIP and usual interstitial pneumonia. HRCT helps detect parenchymal lung disease and differentiate these patterns. Interstitial lung changes in scleroderma are typically less extensive and less coarse than those with idiopathic pulmonary fibrosis (IPF). In the present case, typical findings of NSIP were noted as bilateral GGOs, reticulation and traction bronchiectasis most prominent in the lower lobes and subpleural regions. On the other hand, several typical signs have been identified in SSc-ILD on HRCT but

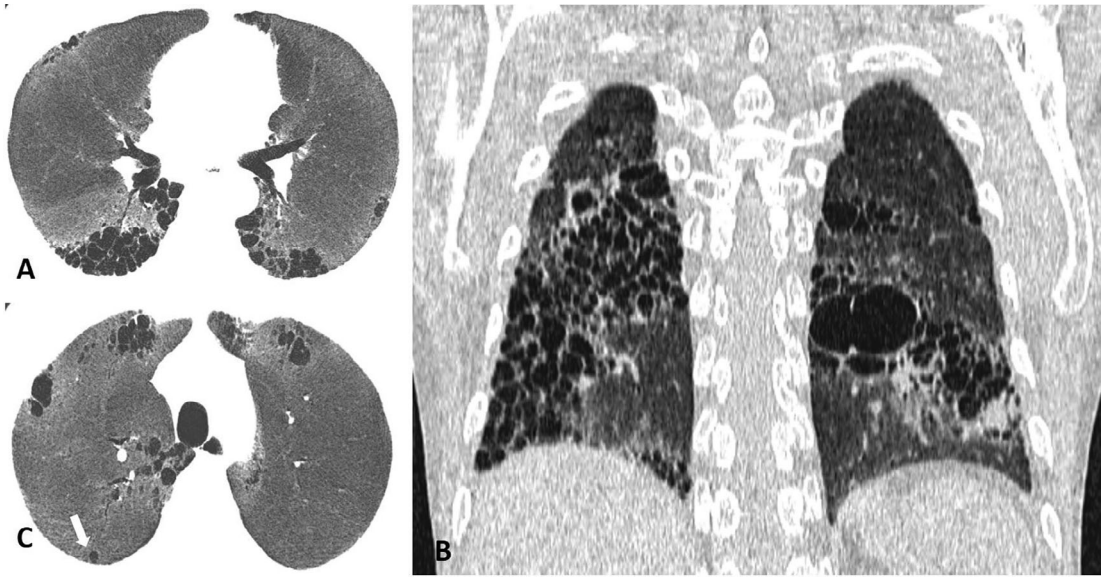

FIGURE 3 High-resolution computed tomography of the chest. Axial image (A) with minimum intensity projection and coronal reconstruction image (B) showed diffuse reticular opacities, ground-glass opacity, extensive bilateral honeycombing and traction bronchiectasis predominantly in the bilateral subpleural lower lobes of the lung. (C) Note the presence of several simple cysts (arrow)

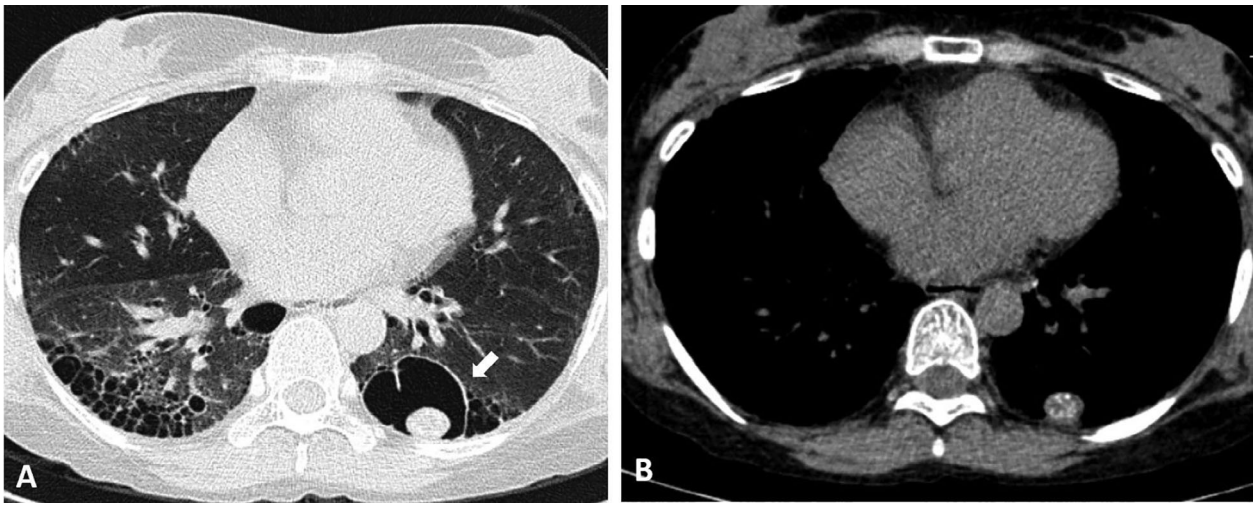

FIGURE 4 A smooth, thin-walled cavity (white arrow) was seen in the left lower lobe. An internal solid component with diffuse and coarse calcification was found in a dependent position suggesting a fungal ball

not in those with IPF such as the straight edge sign, the honeycombing predominant (or exuberant) sign (>70% of fibrotic portions of the lung) and the anterior upper lobe sign.[5]

Pulmonary arterial hypertension (PAH) affects about 15% of patients with SSc and has a poor prognosis.[7] In HRCT, pulmonary artery size greater than the adjacent ascending aorta suggests coexistent pulmonary hypertension. However, in this case, there was no sign of PAH.

Risk factors for progression are diffuse cutaneous SSc, male sex, African American race and the presence of anti-Scl-70 antibodies.[2] Progression of SSc-ILD varies greatly according to the exact phenotype determined early in the course of disease; however, the expected median survival is 15 years.[1]

The mortality rate of pulmonary-associated SSc patients ranges from 17% to 24%.[8] Pulmonary function tests are predictors of disease progression and prognosis.[9] A decrease in forced vital capacity of more than 10% or of 5%–9% with an associated 15% decrease in diffusing capacity of the lungs for carbon monoxide identifies a population at particularly high risk of death.[1] Patients with SSc are more likely to predispose to pulmonary infection owing to host susceptibility factors such as (i) the underlying autoimmune disease itself, (ii) aspiration risks due to oesophageal dysfunction, (iii) treatment with immune-modulating agents and (iv)

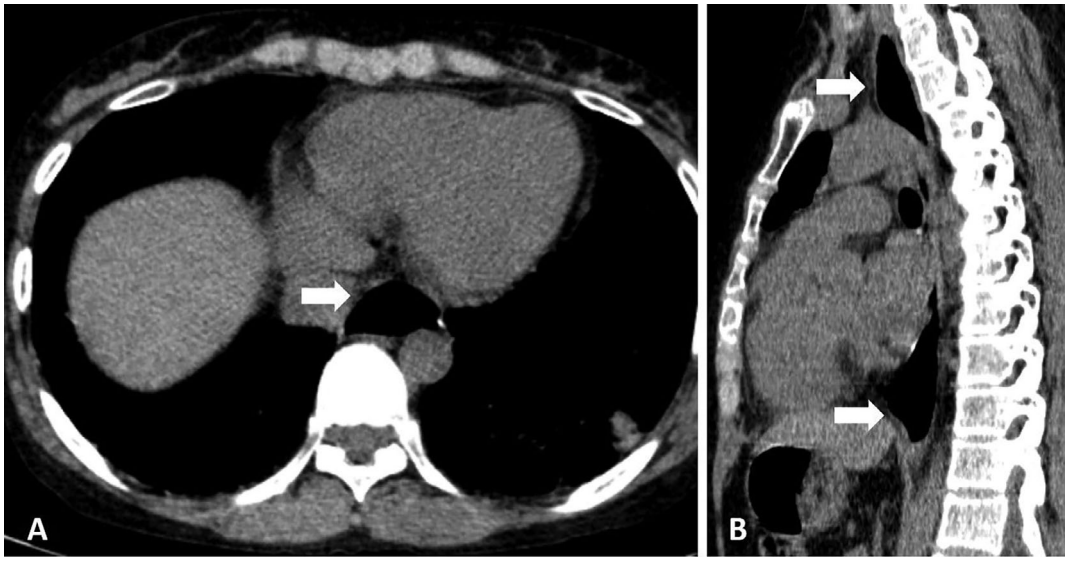

FIGURE 5 Axial and sagittal reconstruction computed tomography images demonstrated multiple segmental oesophageal dilatations without evidence of obstruction, compatible with oesophageal dysmotility

respiratory muscle weakness.[10,11] Thus, these patients are more vulnerable to opportunistic tuberculosis or aspergillosis. Although Aspergillus can grow in any pre-existing cavity or bullous lung lesion, such association with SSc is very uncommon in clinical practice and is rarely reported in the literature. In this case, aspergillosis was suspected based on classic findings of cavitation and Monod sign even though lung biopsy was not indicated. Generally, management of aspergilloma remains difficult, especially in the background of an ILD.[12] Depend on the severity, several therapeutic options have been proposed to manage chronic pulmonary aspergillosis, for example, antifungal agents or surgical resection with or without reduction in the dosage of immunosuppression. Surgical resection may be helpful in patients with a lack of well-controlled, severe haemoptysis from a localized or erosion lesion.[13,14]

In conclusion, SSc-ILD is rare in Asia and should be included in the list of differential diagnoses of ILD. Familiarity with HRCT findings and thorough clinical examination are crucial for diagnosis and treatment.

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CONFLICT OF INTEREST

None declared.

ETHICS STATEMENT

Appropriate written informed consent was obtained for publication of this case report and accompanying images.

AUTHOR CONTRIBUTIONS

Thi Thuy Linh Nguyen conceived the original draft preparation. Trong Binh Le and Trong Khoan Le were responsible for conception and design of the case report. Thi Thuy Linh Nguyen and Thi Y Nhi Nguyen were responsible for data acquisition. Trong Binh Le, Trong Khoan Le and Thanh Thao Nguyen were responsible for image interpretation and critical revision of the manuscript. All the authors approved the final version of the manuscript.

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REFERENCES

1. Perelas A, Silver RM, Arrossi AV, Highland KB. Systemic sclerosis-associated interstitial lung disease. Lancet Respir Med. 2020;8(3):304–20.
2. Khanna D, Tashkin DP, Denton CP, Renzoni EA, Desai SR, Varga J. Etiology, risk factors, and biomarkers in systemic sclerosis with interstitial lung disease. Am J Respir Crit Care Med. 2020;201(6):650–60.
3. Bairkdar M, Rossides M, Westerlind H, Hesselstrand R, Arkema EV, Holmqvist M. Incidence and prevalence of systemic sclerosis globally: a comprehensive systematic review and meta-analysis. Rheumatology. 2021 Jul;60(7):3121–33. https://doi.org/10.1093/rheumatology/keab190
4. Ranque B, Mouthon L. Geoepidemiology of systemic sclerosis. Autoimmun Rev. 2010;9(5):A311–8.
5. Chung JH, Walker CM, Hobbs S. Imaging features of systemic sclerosis-associated interstitial lung disease. J Vis Exp. 2020;(160):e60300. https://doi.org/10.3791/60300
6. Valeur NS, Stevens AM, Ferguson MR, Effmann EL, Iyer RS. Multimodality thoracic imaging of juvenile systemic sclerosis: emphasis on clinical correlation and high-resolution CT of pulmonary fibrosis. AJR Am J Roentgenol. 2015;204(2):408–22.
7. Denton CP, Khanna D. Systemic sclerosis. Lancet. 2017;390(10103):1685–99.

8. Ferri C, Valentini G, Cozzi F, Sebastiani M, Michelassi C, La Montagna G, et al. Systemic sclerosis: demographic, clinical, and serologic features and survival in 1,012 Italian patients. Medicine (Baltimore). 2002;81(2):139–53.
9. Cottin V, Brown KK. Interstitial lung disease associated with systemic sclerosis (SSc-ILD). Respir Res. 2019;20(1):13.
10. Solomon JJ, Olson AL, Fischer A, Bull T, Brown KK, Raghu G. Scleroderma lung disease. Eur Respir Rev. 2013;22(127):6–19.
11. Pagkopoulou E, Arvanitaki A, Daoussis D, Garyfallos A, Kitas G, Dimitroulas T. Comorbidity burden in systemic sclerosis: beyond disease-specific complications. Rheumatol Int. 2019;39(9):1507–17.
12. Walsh TJ, Anaissie EJ, Denning DW, Herbrecht R, Kontoyiannis DP, Marr KA, et al. Treatment of aspergillosis: clinical practice guidelines of the Infectious Diseases Society of America. Clin Infect Dis. 2008;46(3):327–60.
13. Denning DW, Cadranel J, Beigelman-Aubry C, Ader F, Chakrabarti A, Blot S, et al. Chronic pulmonary aspergillosis: rationale and clinical guidelines for diagnosis and management. Eur Respir J. 2016;47(1):45–68.
14. Nandi S, Santra A, Ghoshal L, Kundu S. Interstitial lung disease in systemic scleroderma, complicated with bilateral pulmonary aspergilloma: an unusual association. J Clin Diagn Res. 2015;9(12):OD11–3.

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