

Transthoracic lung ultrasound in the monitoring of interstitial lung disease: a case of scleroderma

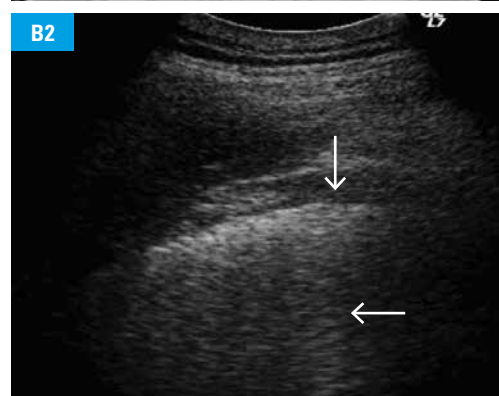
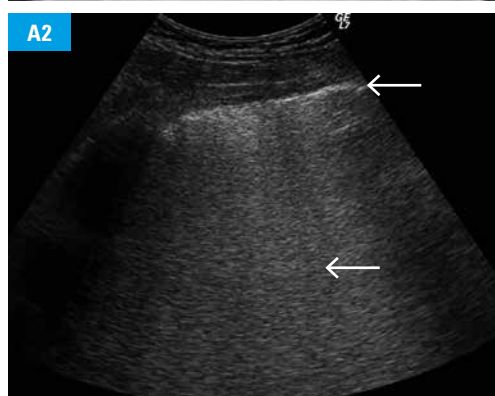
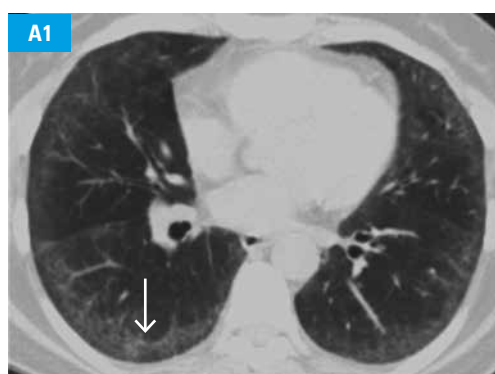
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A 51-year-old woman with a diagnosis of interstitial lung disease within scleroderma was admitted to the Department of Internal Medicine, Connective Tissue Disease and Geriatrics, Medical University of Gdansk, Poland. The goal of this study was to compare monitoring of lung lesions in interstitial lung disease by transthoracic lung ultrasound (TLUS) to monitoring by high-resolution computed tomography (HRCT), before and after treatment with cyclophosphamide. The patient was hospitalized because of gradually increasing exertional dyspnea. Positive findings in the physical examination were: exertional dyspnea, asymmetric rales

at the base of both lungs, joint pain (VAS7), digital edema, sclerodactylia, microstomia, telangiectasia, and Raynaud's phenomenon. Percutaneous oxygen saturation during moderate exercise was low (88%) while normal was at rest (95%). Immune test results included positive antinuclear antibodies Hep-2 antibodies (1:10 240, light type nucleolar) and markedly positive Scl-70 antibodies. Pulmonary function tests reported a reduction in diffusing capacity of the lung for carbon monoxide (60%). The first HRCT study showed fibrotic lesions, mainly in the lower lobes, and ground-glass opacity in the middle fields of the lungs (FIGURE A1, B1). TLUS



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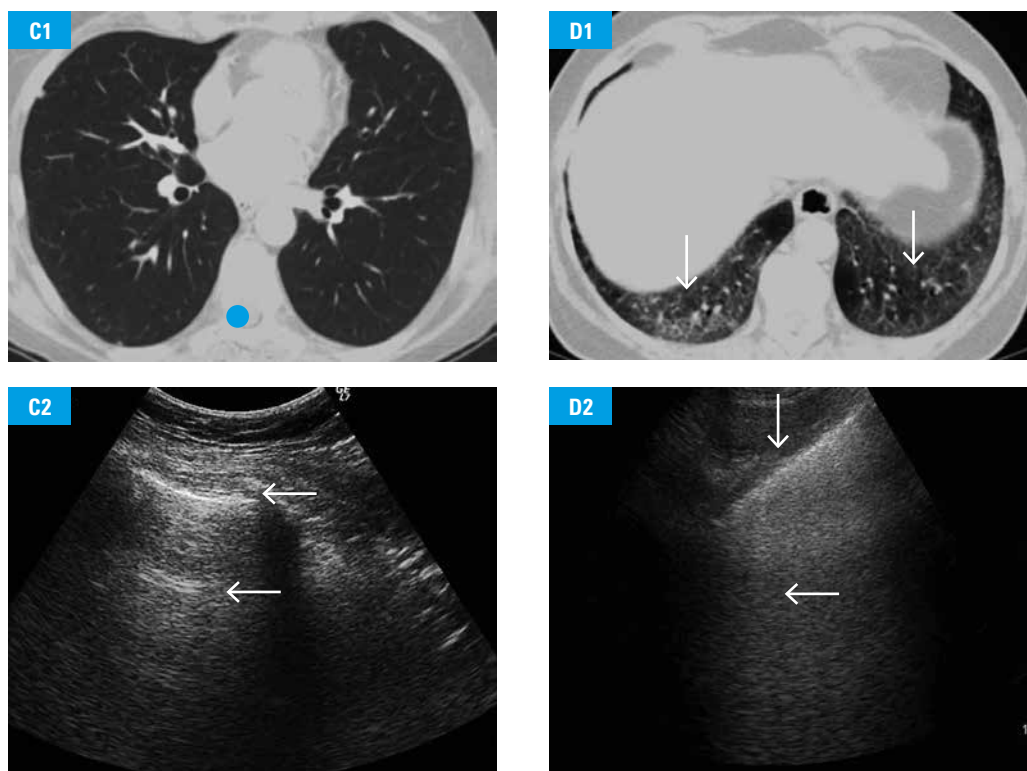


FIGURE High-resolution computed tomography (HRCT) and transthoracic lung ultrasound (TLUS) in a patient diagnosed with scleroderma, before (**A** and **B**) and after (**C** and **D**) cyclophosphamide treatment. **A1**: ground-glass opacity in HRCT (black arrow); **A2**: regular pleural line (small arrow) and hyperechogenic region in TLUS (big arrow); **B1, D1**: diffuse reticular septal thickening (black arrow) in HRCT, completed form of pulmonary fibrosis; **B2, D2**: irregular and blurred pleural line (small arrow) and B line in TLUS (horizontal arrow); **C1**: normal pattern in HRCT; **C2**: normal pattern in TLUS

displayed hyperechogenicity in the middle lung fields with a regular pleural line (active form) and in the lower lobes an irregular and blurred pleural line with B-line artifacts (completed alteration) (**FIGURE A2, B2**). TLUS was performed on the same day as HRCT and the exams were described by 2 clinicians, with similar results. In view of the deterioration of pulmonary function and the presence of a ground-glass sign on HRCT, the patient was scheduled for IV cyclophosphamide therapy (1 g/monthly). After 6 months of treatment, a control study was performed using TLUS, HRCT, and lung function tests. HRCT showed a regression in the ground-glass opacity in the middle fields of the lungs (**FIGURE C1**). Equally, TLUS showed a reduction of the hyperechoic region and the appearance of A-line artifacts – a normal image in the lungs (**FIGURE C2**). In the lower lung fields, both imaging methods evidenced worsening of pulmonary fibrosis (**FIGURE D1, D2**). Pulmonary function tests showed an improvement of respiratory parameters. An increasing number of publications have reported on the possibility of diagnosis of pulmonary fibrosis with TLUS.¹⁻³ This paper presents a simple and noninvasive imaging method to monitor interstitial lung disease.

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