(n=14) of patients with baseline inflammation and 1.4% (n=21) of those with fatty degeneration. Among patients with both inflammation and fatty degeneration at baseline, radiographic progression was present in 2.1% (n=20) at 2 years and 3.7% (n=35) at 5 years.

Bone formation in the cervical and lumbar spine was limited in patients with AS who received anti-TNF therapy for 5 years. Bone inflammation and fatty changes at baseline appear to influence new bone formation. The combination of inflammatory lesions and fatty lesions is most likely to lead to development of new syndesmophytes. Numerically, most new syndesmophytes could not be explained by baseline inflammation or fatty changes. The author concluded that early treatment of active lesions should be the aim of anti-TNF therapy for regression of syndesmophytes in patients with AS.

## Lung Ultrasound for Screening Interstitial Lung Disease

*Written by Toni Rizzo*

Approximately two-thirds of patients with systemic sclerosis develop interstitial lung disease (ILD). High-resolution computed tomography (HRCT) of the chest is the gold standard for diagnosing ILD, but it cannot be used often because of the risks that are associated with radiation exposure and cost concerns. Recent data have suggested that lung ultrasound (LUS) can aid in the detection of ILD by evaluating B-lines, the sonographic marker of pulmonary interstitial syndrome. The aims of this study [Barskova T et al. *Ann Rheum Dis* 2012] were to verify the correlation between HRCT detection of ILD and B-lines and to evaluate the reliability of LUS as a screening tool in patients with very early systemic sclerosis.

A total of 58 consecutive patients (54 women, mean age 51±14 years) with systemic sclerosis were evaluated with chest HRCT and LUS. LUS was performed on the right and left hemithoraces to evaluate the location and number of B-lines. A B-line was defined as an echogenic coherent wedge-shaped signal with a narrow origin in the near field of the image [Volpicelli et al. *Intensive Care Med* 2012]. The number of B-lines in the intercostal spaces was recorded and totaled to produce a score that denoted the extent of ILD. ILD was diagnosed when ≥3 B-lines were found in at least 2 adjacent scanning sites or when >5 B-lines were present.

Among the total population, 32 patients (29 women, mean age 51±15 years) were diagnosed with very early systemic sclerosis. HRCT and LUS were performed a mean of 42±46 days (median 27 days) apart. ILD was found on HRCT in 88% of the total population and in 41% of the very early systemic sclerosis population (p<0.01). Significantly more B-lines were found in patients with HRCT-detected ILD (mean 57±53, median 43) versus those without (mean 9±9, median 5; p<0.0001; Figure 1). Patients with ground glass on HRCT (n=13; 63±47) had a higher total number of B-lines than patients without ground glass (33±40; p<0.05). There was no statistically significant difference in the number of B-lines that were detected between younger (≤50 years) and older (>50) patients or between patients with shorter (<1 year) or longer (>1 year) disease duration.

**Figure 1. Difference in Number of B-Lines in Patients With and Without ILD on HRCT.**
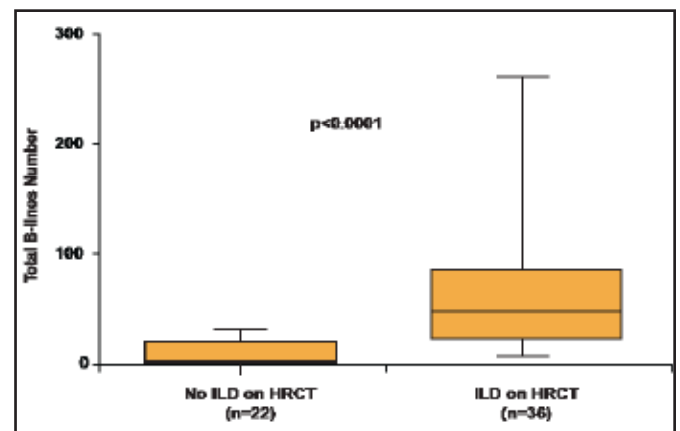


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Analysis of individual patients in the overall population showed 83% concordance between LUS and HRCT, with 100% sensitivity, 100% negative predictive value, 55% specificity, and 78% positive predictive value. All 10 discordant cases were false positive on LUS. Receiver operating characteristic (ROC) curve analysis confirmed the analytical relationship between the number of B-lines and the presence of ILD on HRCT (area under curve, 0.94; 95% CI, 0.89 to 0.99; p<0.0001). The presence of >5 B-lines had 100% sensitivity and 59% specificity. The presence of ≥20 B-lines had 83% sensitivity and 96% specificity.

This study shows that LUS is highly sensitive for detecting ILD in patients with very early systemic sclerosis. The presence of B-lines on LUS examination correlates with detection of ILD on HRCT. LUS appears to be a reliable screening tool to determine which patients should be evaluated further with HRCT.