Supplemental Material:

Interstitial Lung Abnormality and Bronchiectasis Scoring

CT chest images were initially independently scored by two radiologists for evidence of interstitial lung abnormalities as follows: 0 = no evidence of interstitial lung abnormality, 1 = indeterminate for interstitial lung abnormality, 2 = interstitial lung abnormality, 3 = radiologically severe interstitial lung abnormality/interstitial lung disease. Interstitial lung abnormalities were defined as changes affecting >5% of any lobar region including nondependent ground-glass or reticular abnormalities, diffuse centrilobular nodularity, nonemphysematous cysts, honeycombing, or traction bronchiectasis. Scans with focal or unilateral ground-glass attenuation, focal or unilateral reticulation, and patchy ground-glass abnormality (<5% of the lung) were considered indeterminate. Radiologically severe ILA was defined as bilateral fibrosis in multiple lobes associated to honeycombing and traction bronchiectasis in a subpleural distribution. The presence or absence of bronchiectasis was also determined. In cases of discordantly scored scans after the initial reviews, a third radiologist independently reviewed the CT scans and provided an additional score used to reach majority interpretation. For the purposes of this study, we required cases to have ILA score = 0 and no evidence of bronchiectasis by majority interpretation.

Disease-modifying antirheumatic Drugs

We extracted medication prescription orders from the EHR. We examined ever prescription of disease-modifying antirheumatic drugs (DMARDs) prior to the index date. We did not examine post-index medication use since the presence of RA-BR may have affected the choice of DMARDs prescribed. We defined use of conventional synthetic DMARDs (csDMARD) as ever prescription of azathioprine, hydroxychloroquine, leflunomide, methotrexate, mycophenolate mofetil, mycophenolic acid, or sulfasalazine. Biologic DMARDs (bDMARD) included tumor necrosis factor-alpha inhibitors (TNFi: adalimumab, certolizumab pegol, etanercept, golimumab, and infliximab) as well as abatacept, anakinra, rituximab, tocilizumab, and sarilumab. We defined targeted synthetic DMARD (tsDMARD) use as prescription for tofacitinib, baricitinib, or upadicitinib. We also examined medications individually.

Pulmonary Function Testing

For cases, we obtained pulmonary function testing (PFT) data including absolute and % predicted forced expiratory volume in the first second (FEV_1), absolute and % predicted forced vital capacity (FVC), and the ratio of FEV_1 to FVC (FEV_1/FVC) results from the date closest to bronchiectasis diagnosis.

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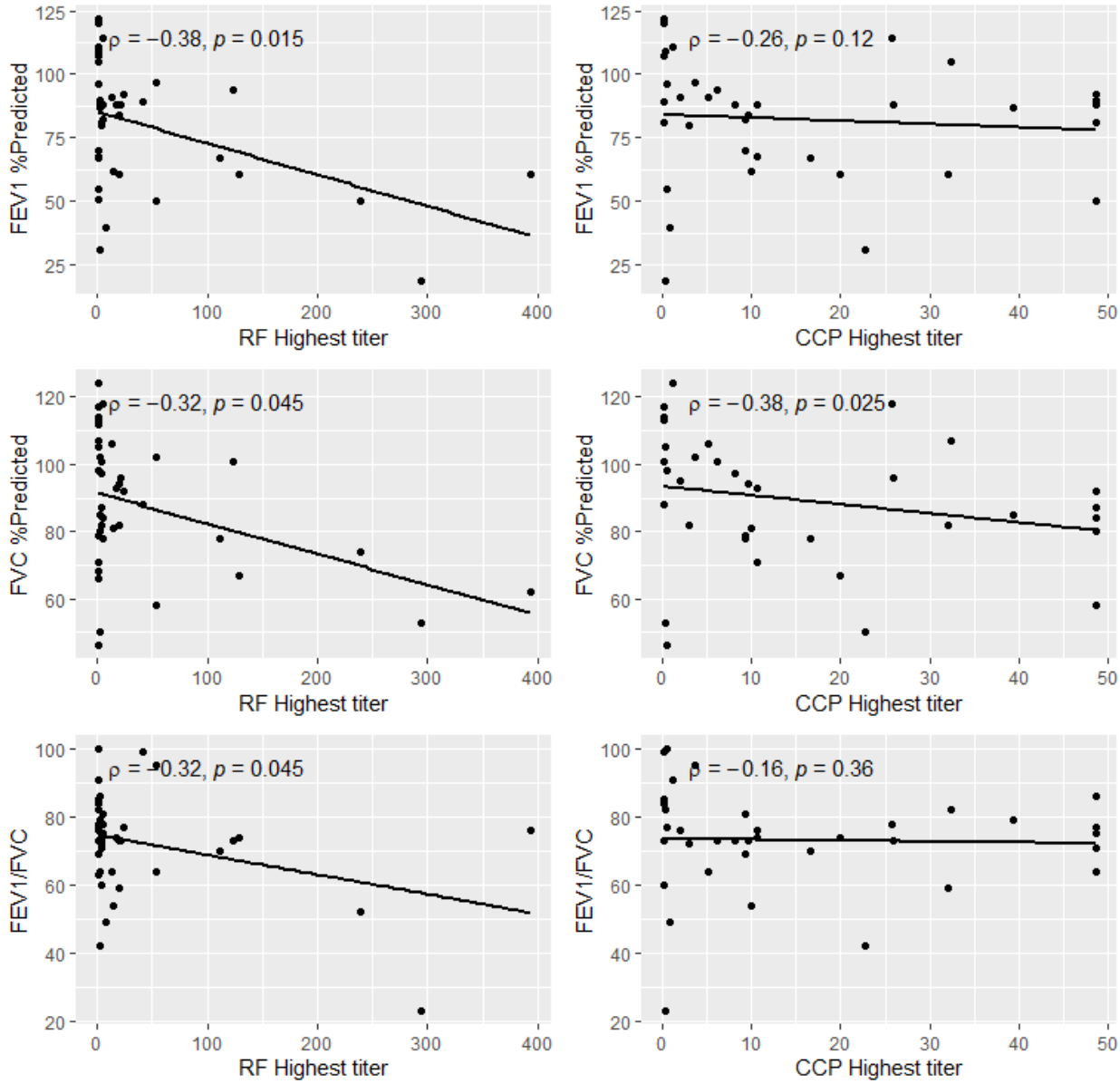
Supplemental Table S1: Pulmonary function testing (PFT) within one year of bronchiectasis diagnosis in RA-associated bronchiectasis cases.

Characteristic	RA-BR cases (n=57)
PFT available (n, %)	45 (79%)
FEV_1 % predicted (median, IQR)	88 (66, 95)
FVC % predicted (median, IQR)	88 (78, 102)
FEV_1/FVC (median, IQR)	74 (68, 79)
Obstructive pattern* (n, %)	12 (21%)
Restrictive pattern† (n, %)	13 (23%)
Diffusion abnormality (n, %)‡	14 (25%)
No PFT available (n, %)	13 (23%)

* defined as FEV_1/FVC <70%
† defined as FVC <70% predicted
‡ defined as DLCO corrected for hemoglobin < 70% predicted
DLCO = diffusing capacity of the lungs for carbon monoxide corrected for hemoglobin, FEV_1 = forced expiratory volume in the first second, FVC = forced vital capacity

Supplemental Figure S1: Correlation between % predicted FEV_1, % predicted FVC, and FEV_1/FVC ratio with highest RF and anti-CCP titers among RA-BR cases with pulmonary function test data (n=44).



***** titer values represent fold above upper limit of normal

CCP = anti-cyclic citrullinated peptide; FEV_1 = forced expiratory volume in the first second, FVC = forced vital capacity

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Supplemental Table S2: Association of clinical factors and isolated RA-associated bronchiectasis, excluding 10 cases with allergic bronchopulmonary aspergillosis, tuberculosis, nontuberculous mycobacterial infection, or primary immunodeficiency syndrome

Characteristic	Multivariable* OR for isolated RA-BR (95%CI)	p-value
Demographics		
Male	1.00 (Ref)	
Female	0.52 (0.21-1.33)	0.17
White	1.00 (Ref)	
Non-White	0.76 (0.27-2.13)	0.60
Lifestyle		
Never smoker	1.00 (Ref)	
Past smoker	0.67 (0.30-1.50)	0.33
Current smoker	0.39 (0.07-2.11)	0.27
Smoking pack-years (per unit)	1.00 (0.98-1.02)	0.94
BMI at RA diagnosis (per kg/m^2)	0.96 (0.90-1.02)	0.15
RA factors		
Age at RA diagnosis (per 10 years)	**1.46 (1.06-2.02)**	**0.02**
RA duration at index date (per year)	**1.04 (1.01-1.08)**	**0.02**
Seronegative RA	1.00 (Ref)	
Seropositive RA	**5.10 (2.05-12.67)**	**0.0004**

*Mutually adjusted for all covariates listed.
BMI = body mass index, RA = rheumatoid arthritis

Supplemental Table S3: Associations of RA-related autoantibodies with isolated RA-associated bronchiectasis, excluding 10 cases with allergic bronchopulmonary aspergillosis, mycobacterial infection, or primary immunodeficiency syndrome

RA-related autoantibody status*	Multivariable† OR for isolated RA-BR (95%CI)	p-value
RF negative	1.00 (Ref)	
RF positive (>1x ULN)	**4.58 (2.07-10.15)**	**0.0002**
RF negative	1.00 (Ref)	
RF low-positive (>1-3x ULN)	2.50 (0.83-7.57)	0.11
RF high-positive (>3x ULN)	**5.33 (2.34-12.17)**	**<0.0001**
Anti-CCP negative	1.00 (Ref)	
Anti-CCP positive (>1x ULN)	**4.42 (1.89-10.33)**	**0.0006**
Anti-CCP negative	1.00 (Ref)	
Anti-CCP low-positive (>1-3x ULN)	2.13 (0.40-11.35)	0.38
Anti-CCP high-positive (>3x ULN)	**4.71 (2.00-11.07)**	**0.0004**

* RF analyses included 44 cases and 352 controls (n=11 missing RF status); anti-CCP analyses included 37 cases and 320 controls (n=50 missing anti-CCP status)
†Adjusted for age, sex, race, RA duration, smoking status, pack-years, and body mass index
Anti-CCP = anti-cyclic citrullinated peptide; BR = bronchiectasis; CI = confidence interval; OR = odds ratio; RA = rheumatoid arthritis; RF = rheumatoid factor; ULN = upper limit of normal