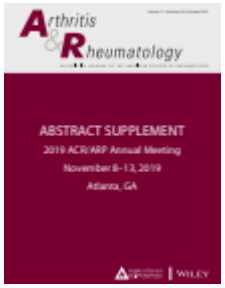

Abstract Number: 2610 Relationship Between Parenchymal and Vascular Features in Systemic Sclerosis-Interstitial Lung Disease: Results from Quantitative Analysis of Chest Computed Tomography Cosimo Bruni , 1 Mariaelena Occhipinti , 2 Gianna Camiciottoli , 3 Maurizio Bartolucci , 4 Michael Pienn , 5 Gemma Lepri , 1 Alessio Fabbrizzi , 3 Alessandra Tottoli , 1 Giulia Ciardi , 3 Dilia Giuggioli , 6 Giovanna Cuomo , 7 Francesco Masini , 7 Andrea Olschewski , 5 Federico Lavorini , 3 Stefano Colagrande , 8 and Marco Matucci-Cerinic 9 , 1 Dept. Experimental and Clinical Medicine, Division of Rheumatology, Azienda Ospedaliera Universitaria Careggi – University of Florence, Florence, Italy, 2 Dept. Experimental and Clinical Medicine, Div. Pneumology and Div. Radiology II, Azienda Ospedaliera Universitaria Careggi – University of Florence, Florence, Italy, 3 Dept. Experimental and Clinical Medicine, Div. Pneumology, Azienda Ospedaliera Universitaria Careggi – University of Florence, Florence, Italy, 4 Dept. of Services, Div. Emergency- Urgency Radiology, Azienda Ospedaliera Universitaria Careggi, Florence, Italy, 5 Ludwig Boltzmann Institute for Lung Vascular Research, Institute of Physiology, Medical University of Graz, Graz, Austria, 6 Rheumatology Unit, University of Modena and Reggio Emilia, Azienda Ospedaliero- Universitaria, Policlinico di Modena, Modena, Italy, 7 Division of Internal Medicine, Department of Medical and Surgical Sciences, “Luigi Vanvitelli” University of Campania, Naples, Italy, 8 Dept. Experimental and Clinical Medicine, Div. Radiology II, Azienda Ospedaliera Universitaria Careggi – University of Florence, Florence, Italy, 9 University of Florence, Department of Medicine, Florence, Italy, Florence, Italy SESSION INFORMATION Session Date: Tuesday, November 12, 2019 Session Title: Systemic Sclerosis & Related Disorders – Clinical Poster III Session Type: Poster Session (Tuesday) Session Time: 9:00AM–11:00AM Background/Purpose : Interstitial lung disease (ILD) and pulmonary arterial hypertension negatively impact on Systemic sclerosis (SSc) prognosis. Chest computed tomography (CT) is the gold standard in assessing ILD and helps in evaluating associated vascular involvement. However, CT scans qualitative analysis is limited by low reproducibility and time constraints. Recently developed quantitative techniques may overcome these limitations. We aimed at evaluating parenchymal and vascular features in SSc- ILD by using quantitative analysis (QA) of CT scans and test correlation with clinical- functional data. Methods : We analyzed chest CT scans in SSc patients performed with spirometric gating at TLC. A computational platform for texture analysis of ILD patterns (CALIPER), through Imbio LTA Launchpad, quantifi ed the extent of normal pattern (NP%), ground glass opacities (GG%), reticulation (RET%), and honeycombing (HC%) [1] . An automated vessels segmentation was performed using a software program developed by the Ludwig Boltzmann Institute for Lung Vascular Research [2] , calculating total, arterial, and venous vascular volumes (TV, AV, VV), and relative volumes (TV%, AV%, VV%). Clinical, lung functional and diffusion data, as well as disability indexes were also collected. Results : 44 patients/CT scans were eligible (89% female, 42% diffuse, 7% PAH) for both software analysis. CALIPER showed GG% as the most frequent radiological pattern (median 2.7%, 0.2- 7.6 IQR), with positive correlation with mRSS (r=0.363, p=0.016) and increasing NYHA class (r=0.306, p=0.037), while negative correlation with FVC (r=- 0.371, p=0.009) and TLC (r=- 0.356, p=0.024). Similarly, RET% showed positive correlation with mRSS (r=0.491, p=0.001) and negative correlation with desaturation on 6 minutes walking test (r=- 0.433, p=0.017). On the vascular analysis, TV% had positive correlation with increasing NYHA class (r=0.319, p=0.048), diffi culty increase in walking domains of HAQ- DI (r=0.607,

p=0.002) and Dlco/AV (r=0.414, p=0.007), while negative correlation with FVC (r=- 0.449, p=0.003) and TLC (r=- 0.496, p=0.003), with similar signifi cant correlations replicated for AV%. When testing parenchymal with vascular data (Table 1), higher GG% and RET% correlated with higher vascular relative volumes. In addition, GG% correlated with AV. Conversely, increasing NP% was associated to a decrease in AV and in all vascular relative volumes. Conclusion : This is the fi rst study that shows a direct link between ILD and increase in lung vascular volume in SSc patients. Different hypothesis could be postulated, such as a reduction in pulmonary volume due to fi brosis, an increase in absolute vascular volumes as a phenomenon of neo- angiogenesis secondary to fi brosis, or a paraphysiological mechanism of redistribution of blood fl ow in lung areas less involved by ILD. Further studies on lung vessel quantifi cation and distribution are ongoing. Disclosure : C. Bruni , Eli Lilly, 5, 8, Actelion, 8; M. Occhipinti , Imbio LLc, 5; G. Camiciottoli , None; M. Bartolucci , None; M. Pienn , Ludwig Blotzmann Institute for Lung Vascular Research, 3; G. Lepri , None; A. Fabbrizzi , None; A. Tottoli , None; G. Ciardi , None; D. Giuggioli , None; G. Cuomo , None; F. Masini , None; A. Olschewski , Ludwig Blotzmann Institute for Lung Vascular Research, 3, Ludwig Blotzmann Institute for Lung Vascular Research, 2, 3; F. Lavorini , GlaxoSmithKline, 5, Boerhinger Ingelheim, 5; S. Colagrande , None; M. Matucci-Cerinic , Actelion, 2, 5, 8, Bayer, 5, 8, BMS, 2, 5, Chemomab, 5, J&J, 2, J&J, Janssen, Lilly, MSD, Pfi zer, 5, 6, Lilly, 5, Pfi zer, 5

Table 1. Correlation between quantitative parenchymal and vascular data

		TV_cm3	AV_cm3	VV_cm3	TV%	AV%	VV%
normal%	Pearson R	-,270	-,340*	-,142	-,540**	-,564**	-,470**
	p value	,080	,026	,365	<0,001	<0,001	,001
GG%	Pearson R	,230	,305*	,099	,516**	,543**	,441**
	p value	,137	,047	,527	<0,001	<0,001	,003
RET%	Pearson R	,161	,202	,087	,398**	,406**	,357*
	p value	,302	,194	,580	,008	,007	,019
HC%	Pearson R	-,056	-,081	-,014	,096	,066	,127
	p value	,723	,606	,927	,539	,673	,416