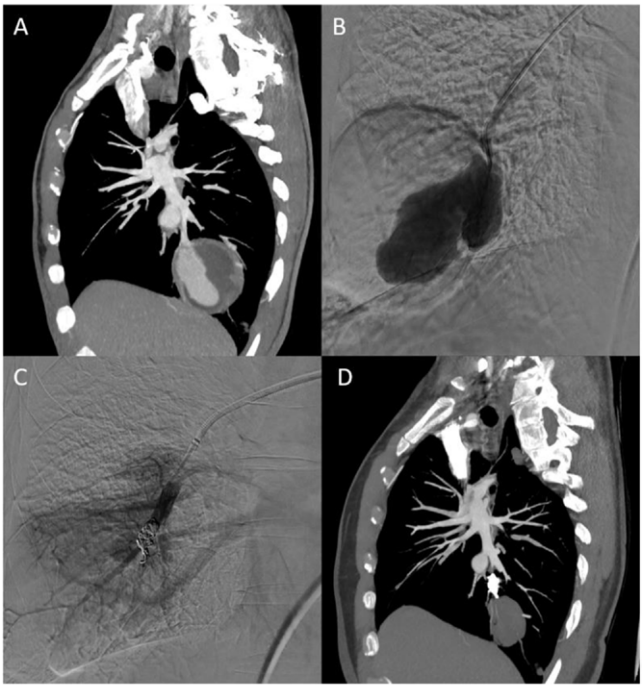

A. A large, partly-thrombosed aneurysm of the right pulmonary artery is shown, as well as a smaller aneurysm. B-C. Right pulmonary artery aneurysm in the lower lobe, before and after endovascukar embolization with coils and plug. D. Three-months CT scan after embolization.

Figure 1.

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Diagnostics and imaging procedures

AB0787

RECEIVER OPERATING CHARACTERISTIC ANALYSIS OF JOINT INFLAMMATION IN RELATION TO DISEASE ACTIVITY IN RHEUMATOID ARTHRITIS ASSESSED USING A NOVEL COMBINED THERMAL AND ULTRASOUND IMAGING

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Background: A novel combined thermal and ultrasound (CTUS) imaging approach in rheumatoid arthritis (RA) was recently shown to be superior to either imaging modality alone in terms of correlation with the 28-joint disease activity score (DAS28).
Objectives: To determine the performance of CTUS imaging in identifying RA patients with at least moderate disease activity (DAS28 > 3.2).
Methods: Bilateral hand (22 joints) thermal and ultrasound (US) imaging was performed. Thermal imaging provides the surface temperature readings at the joints with MAX, AVG and MIN derived per patient by summing the temperature differences with a control temperature, for the respective maximum (Tmax), average (Tavg) and minimum (Tmin) temperatures at each joint. US imaging assesses joint inflammation by summing up the power Doppler (PD) and grey-scale (GS) joint inflammation scores (graded 0-3 at each joint recess) at each joint to obtain the respective total PD and total GS scores per patient. CTUS imaging utilizes data from both thermal and US imaging to derive the MAX (PD), AVG (PD) and MIN (PD) by multiplying MAX, AVG and MIN by a factor of 2 when a patient's Total PD > median score, which otherwise remained the same as the MAX, AVG and MIN. The results of the imaging parameters were compared between patients with DAS28 ≤ 3.2 and those with DAS28 > 3.2. Sensitivity (Sn), specificity (Sp) and receiver operating characteristic (ROC) curve analysis was performed to determine if the use of CTUS imaging can help identify patients with DAS28 > 3.2.
Results: In this cross-sectional study, 814 joints from 37 RA patients (75.7% female; 75.7% Chinese; baseline mean disease duration, 30.9 months; baseline mean DAS28, 4.43) were imaged. The mean (SD) values for the CTUS—but not single modality—imaging parameters (Table 1) were all significantly greater among patients with DAS28 > 3.2 versus those with DAS28 ≤ 3.2 (P-values were all <0.01). Based on cut-off levels of (a) MAX (PD) ≥ 94.5, (b) MIN (PD) ≥ 42.3 and (c) AVG (PD) ≥ 64.6 in identifying patients with DAS28 > 3.2, the respective area under the ROC curves (AUCs) (95%CIs) were (a) 0.731 (0.541, 0.921) with Sn = 58.1%; Sp = 100.0%; negative predictive value (NPV) = 31.6%; positive predictive value (PPV) = 100.0%; accuracy = 64.9%, (b) 0.758 (0.591, 0.925) with Sn = 61.3%; Sp = 100.0%; NPV = 33.3%; PPV = 100.0%; accuracy = 67.6% and (c) 0.763 (0.596, 0.931) with Sn = 61.3%; Sp = 100.0%; NPV = 33.3%; PPV = 100.0%; accuracy = 67.6%.
Conclusion: The severity of joint inflammation as detected by CTUS—but not single modality—imaging parameters were significantly greater among patients with DAS28 > 3.2 versus those with DAS28 ≤ 3.2. For the first time ever, by applying ROC analysis, this has helped to determine cut-off MAX (PD), MIN (PD) and AVG (PD) levels for identifying patients with DAS28 > 3.2; the usefulness of these cut-off levels will require further validation in independent RA cohorts.

Table 1. Comparison of imaging parameters between patient groups.

Imaging Parameter	DAS28			
	Mean (95% CI)		Difference (95% CI)	P-value
	DAS28 ≤ 3.2	DAS28 > 3.2		
MAX (PD)	75.25 (58.8, 91.7)	119.5 (101.12, 137.87)	-44.25 (-70.49, -18.01)	**0.0022****
MIN (PD)	33.72 (25.82, 41.61)	57.51 (47.63, 67.39)	-23.79 (-37.13, -10.45)	**0.0012****
AVG (PD)	50.72 (39.45, 61.98)	85.39 (71.89, 98.88)	-34.67 (-53.27, -16.07)	**0.0008*****
MAX	67.38 (50.75, 84.02)	82.23 (74.71, 89.75)	-14.85 (-34.11, 4.42)	0.1268
MIN	30.27 (22.06, 38.47)	40.02 (35.02, 45.03)	-9.75 (-22.18, 2.66)	0.1198
AVG	45.45 (33.94, 56.96)	59.11 (52.99, 65.23)	-13.66 (-29.04, 1.72)	0.0801
Total PD	2.83 (-0.23, 5.9)	3.65 (2.71, 4.58)	-0.82 (-3.39, 1.77)	0.5269
Total GS	6.67 (1.31, 12.02)	6.58 (4.12, 9.04)	0.09 (-6.21, 6.38)	0.9780

Statistically significant: **P<0.01, ***P<0.001.

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AB0788

MARKER OF CARTILAGE TISSUE LESION IMMUNOPATHOGENESIS OF RHEUMATOID ARTHRITIS

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Background: Collagen type 2 is the basic protein of cartilaginous tissue composing over 80% of its mass. Finding excessive antibodies to collagen type 2 and immune complexes is a diagnostic and prognostic criterion of immune lesion of articular cartilage.
Objectives: To study production of antibodies to collagen type 2 in patients with rheumatoid arthritis using immobilized magnetically controlled forms.
Methods: The antigen was represented by commercial formulation of collagen type 2 produced by Serva (Sweden). Antibodies to collagen type 2 were determined in the patients' blood serum by way of a technique of immunoenzyme assay (ELISA test) using immobilized magnetic sorbents. Magnetic sorbents were polyacrylamide granules from 10 to 100 micron in size containing magnetic material and collagen type 2. We studied 30 apparently healthy donor individuals and 92 patients with a confirmed diagnosis of rheumatoid arthritis.
Results: A study of sera from rheumatoid arthritis patients revealed antibodies to collagen type 2 in 63 patients (68.48%). The correlation coefficient between anti-collagen type 2 antibodies, and IgA / IgM amounted to 0.28 and 0.36, correspondingly. At stage 1 and 2 of disease activity the level of antibodies was higher than in donors (p<0.001). The highest level of antibodies to collagen type 2 was seen in patients with stage 3 of disease activity (0.55±0.02). The amount of antibodies to collagen type 2 in patients with visceral manifestations of rheumatoid arthritis was no different from that in patients without any additional organ involvement, which is hardly surprising since collagen type 2 is mostly localized in articular cartilage and is practically absent from the connective tissue of other organs and systems.
Conclusion: Thus the presence of antibodies to collagen type 2 correlates with the disease activity and is an important marker of articular cartilage lesion in patients with rheumatoid arthritis.
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