Diagnostics and imaging procedures

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ANGIOGRAPHIC CHARACTERISTICS OF VASCULOPATHY IN PATIENTS WITH CONNECTIVE TISSUE DISEASES

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Background: Vasculopathies are a heterogeneous group of morphologically and pathogenetically distinct vascular diseases. They include both non-inflammatory and inflammatory vasculopathies. Patients with connective tissue disease (CTD), including systemic sclerosis (SSc), dermatomyositis (DM), and polymyositis (PM), can develop a non-thrombotic proliferative vasculopathy (NTPV), a distinctive disease entity characterized by vascular wall proliferation without overt evidence of vascular inflammation and intraluminal thrombosis.

Objectives: This study aimed to analyze the angiographic features of NTPV in patients with CTD, including SSc, DM, and PM in comparison to polyarteritis nodosa (PAN).

Methods: Angiograms of 47 extremities (24 upper and 23 lower extremities) of 11 patients with CTD (6 SSc, 4 DM, and 1 PM), and 12 patients with PAN who presented with critical digital ischemia between January 2001 and May 2020 were analyzed. The degree and pattern of stenosis, occlusion, aneurysms, and neovascularization in proximal arteries (defined as arteries above the wrist and ankle) and distal arteries (defined as those at or below the wrist and ankle) were compared between CTD-vasculopathy and PAN.

Results: Diffuse narrowing was significantly more frequent (66.1% vs. 38.0%; $p=0.001$), whereas multifocal stenosis was significantly less frequent (6.5% vs. 26.8%, $p=0.002$) in the CTD group than in the PAN group. All patients with CTD and 72.0% with PAN had diffuse narrowing in the distal arteries ($p=0.010$). Tapered occlusion was more frequent than abrupt occlusion in patients with CTD (43.5% vs. 11.3%). Abrupt occlusion (11.3% vs. 29.6%, $p=0.010$) and aneurysm formation (1.6% vs. 11.3%; $p=0.037$) were significantly less frequent in the CTD than in the PAN group. After 1 year, three patients (27.3%) in the CTD group and seven (58.3%) in the PAN group showed improvements in digital ischemia. Moreover, four patients (36.4%) in the CTD group and two (16.7%) in the PAN group underwent auto- or surgical amputation.

Conclusion: Patients with CTD-vasculopathy exhibit more frequently diffuse smooth narrowing, tapered occlusion and delayed distal blood flow on conventional angiograms and worse outcomes than with PAN patients. Larger studies are needed to confirm the current findings.

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Figure 1. Angiographic features of CTD-vasculopathy and PAN.

Arteries in the (A) upper extremities and (B) lower extremities of patients with CTD-vasculopathy and PAN. Diffuse narrowing is indicated by white arrowheads; tapered occlusion by white arrows; multifocal stenosis by black arrowheads; abrupt occlusion by black arrows; aneurysmal changes by empty arrows; grade 2 tortuosity by white stars; and grade 3 tortuosity by black stars. CTD, connective tissue disease; PAN, polyarteritis nodosa.

Table 1. Comparison of angiographic parameters between CTD-vasculopathy and PAN.

	CTD (upper 14, lower 8)	PAN (upper 10, lower 15)	p-value
Total number of images	62	71	
Shoulder/elbow/wrist and hand	11/14/14	8/10/10	
Femoral/knee/ankle and foot	7/8/8	13/15/15	
Stenosis			
Diffuse narrowing	41/62 (66.1%)	27/71 (38.0%)	0.001
Focal stenosis	13/62 (21.0%)	10/71 (14.1%)	0.295
Multifocal stenosis	4/62 (6.5%)	19/71 (26.8%)	0.002
Occlusion			
Tapered occlusion	27/62 (43.5%)	23/71 (32.4%)	0.185
Abrupt occlusion	7/62 (11.3%)	21/71 (29.6%)	0.010
Aneurysm	1/62 (1.6%)	8/71 (11.3%)	0.037
Neovascularization in muscular branch			
Tortuosity			
Grade 1	45/62 (72.6%)	30/68 (39.1%)	0.002
Grade 2	11/62 (17.7%)	14/68 (23.9%)	
Grade 3	6/62 (9.7%)	24/68 (37.0%)	

Tortuosity grade 1, normal; grade 2, mild to moderate; grade 3, severe (hypertortuosity). CTD, connective tissue disease; PAN, polyarteritis nodosa.

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QUANTIFICATION OF BONE MARROW EDEMA BY MRI OF THE SACROILIAC JOINTS IN PATIENTS DIAGNOSED WITH AXIAL SPONDYLOARTHRITIS: RESULTS FROM THE ESPERANZA COHORT

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Background: The present study analyzes the added value of quantification by MRI of SI joints by comparing it to the standard interpretation with ASAS criteria for the classification of patients with axSpA of recent onset and a six-year follow-up.

Objectives: To evaluate if the quantification of bone marrow edema (BME) of the sacroiliac (SI) joints by magnetic resonance imaging (MRI) improves capacity for axial spondyloarthritis (axSpA) classification in comparison to the assessment of sacroiliitis by means of ASAS classification criteria.

Methods: Prospective study from the ESPERANZA cohort involving 66 subjects with an available MRI of the SI joints at baseline. This subgroup includes patients with axSpA (n=28), peripheral spondyloarthritis (n=10) and a group with other diagnoses that were not spondyloarthritis (n=28). Measures of diagnostic usefulness (area under the curve (AUC), sensitivity, specificity, Youden's J statistic, LR+ and LR-) were calculated for MRI of the SI joints according to ASAS criteria and for MRI quantified by means of SCAISS (Spanish tool for semi-automatic quantification of sacroiliac inflammation by MRI in spondyloarthritis). This analysis was stratified in patients who were HLA-B27 positive and negative.

Results: Out of a total of 66 MRI of the SI joints, 20 (30.3%) were positive according to ASAS criteria. Out of these 20 subjects, 18 patients with final diagnosis of axSpA had a positive MRI, and 2 patients did not have axSpA. Out of the 66 patients of the cohort, 23 (34.8%) patients were HLA-B27 positive and 42 (63.6%) were negative. AUC value with bone marrow edema (BME) quantification was 0.919 (CI95% 0.799-1) for HLA-B27 positive patients and 0.884 (CI95% 0.764-1) for HLA-B27 negative patients. A SCAISS cutoff point of 80 units obtained a specificity of 94.4% and LR+ 7.5, while assessment by ASAS criteria showed a specificity value of 90% and LR+ 6.4.

Conclusion: For patients with suspected axSpA, quantification of BME improves the predictive capacity of MRI of the SI joints, for both HLA-B27 positive and negative patients.

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