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DIFFERENT CLINICAL FEATURES OF AORTIC INTRAMURAL HEMATOMA VERSUS DISSECTION INVOLVING THE DESCENDING THORACIC AORTA

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Background: Although indicators of surgical and medical treatment have been applied to patients with typical dissection (AD) of the descending thoracic aorta, the natural history of descending aortic intramural hematoma (AIH) is not yet clearly known.

Objective: The goal of this study was to test the hypothesis that the absence of flow communication through the intimal tear in AIH involving the descending aorta has a different clinical course compared with AD.

Methods: We prospectively evaluated clinical and echocardiographic data between AD (76 patients) and AIH (27 patients) of the descending thoracic aorta.

Results: Patients had no differences In age, gender, or clinical presentation. The development of pleural effussion or periaortic hematoma was more frequent in patients with AIH than it was in patients with AD. AIH and AD had same predictors of complications at follow-up: aortic diameter (>5 cm) at diagnosis and persistent back pain. Although medical treatment was selected in the same proportion between groups, surgical treatment was more frequently selected in AD (39% vs. 22%, $p < 0.01$). AD patients who received surgical treatment had higher mortality than those with AIH (36% vs. 17%, $p < 0.01$). There was no difference in mortality between patients who received medical treatment (15% in AD vs 14% in AIH, $p = 0.7$). In follow-up imaging studies of 23 patients with AIH,6 patients (25%) showed complete resolution and 6 patients (25%) increased the descending aortic diameter. Typical AD developed in 3 patients (13%). A three-year survival rate did not show significant difference ($82 \pm 6\%$ in AIH vs $75 \pm 7\%$ in AD, $p = 0.37$).

Conclusion: AIH of the descending thoracic aorta have relatively frequent complications at follow-up including dissection and aneurysm formation. Medical treatment with very close imaging follow-up and timed elective surgery in cases with complications allow better management for patients with AIH of the descending thoracic aorta.

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ULTRASOUND DOPPLER TECHNIQUE AND THE RENAL ARTERIES: DIAGNOSTIC IMPACT OF THE ECHO ENHANCER SH U 508A AND A NEW RENAL-HILIAR VELOCITIES INDEX

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Introduction: Renal vascular hypertension (RVH) accounts for 1–5% of the total population of patients with high blood pressure. In addition, the prevalence between patients with coronary and peripheral vascular disease usually is greater to 40%. Several noninvasive methods for diagnosis have been used in hypertensive patients with a suspicion of renal arteries stenosis, such as color Doppler ultrasound. The incorporation of echo enhancers (EE) to the echographic technique has had a significant impact for the yield of the study.

Objective: To analyze the feasibility of total visualization of main renal artery with and without EE. To determine the sensitivity and diagnostic specificity of the conventional color Doppler parameters for the diagnosis of RVH: renal peak systolic velocity (RePSV), renal aortic ratio (RAR): RePSV/peak systolic velocity at the abdominal aorta (AoPSV), with and without EE. A new index of velocities was also proposed: the renal-hiliar index (ReHi-Index): RePSV/renal hilum peak systolic velocity (ReHiPSV), and was compared with conventional parameters in terms of sensitivity and specificity, using angiography as the gold standard method.

Materials and Methods: 77 patients were included (45 males, 32 females, mean age 54 years) between July 1998 and April 2003. Echo-Doppler analysis was made with and without EE, comparing the feasibility of visualization of the renal arteries in all their passage: proximal, medium, and distal. Three different echo machines were used: Ving Med CFM 800 (2,5 MHz and 3,5 MHz transducer), Toshiba SSH 140-A (2,5 MHz and 3,75 MHz transducer) and Hewlett Packard Image Point HX (2,5 MHz and 4,0 MHz transducer). An EE composed of 999 mg of galactose and 1 mgof palmitic acid by each gram of grains was used with 300 mg/mL concentration. The direct parameters measured in the main renal artery were the following: (1) RePSV: as the highest Doppler velocity measured in systole in the main renal artery. (2) RAR: as the rate between renal peak systolic velocity, RePSV, divided by aortic peak systolic velocity, AoPSV, measured at the abdominal aorta. (3) ReHi Index: the rate between RePSV and renal hilum peak systolic velocity, ReHiPSV, measured at the hilum in its extrarenal section. Stenosis was considered significant when RePSV > 200 cm/s, RAR > 3.5 and new renal-hiliar Index >2.7. Renal angiography was performed in 16 patients with echographic diagnosis of renal artery stenosis. Statistical analyses included specificity, sensibility, and relative risk calculations on the three mentioned direct parameters. The Mantel-Haenszel chisquare test was applied to analyze statistically significant differences between the discrete parameters.

Results: 77 patients were examined with conventional color echo Doppler technique with and without EE. All 151 of 151 the renal arteries segments, proximal, medium and distal, were observed with EE, (100% feasibility) and 137 of 151 without EE (91% feasibility) ($p < 0.001$). Renal angiography revealed severe stenosis in 16 arteries (>60%), 3 with moderate obstruction (40–59%), 10 normal, 2 occluded, and one absent.The diagnostic accuracy of the direct parameters for the diagnosis of severe renal stenosis was as follows: (1) RePSV > 200 cm/s; 94% sensibility, 77% specificity, RR 9.17 ($p < 0.001$). (2) RAR > 3.5: 69% sensibility, 100% specificity, RR 3.6 ($p< 0.001$). (3) New ReHi-Index > 2.7: 94% sensibility, 92% specificity, RR 12.24 ($p< 0.001$). The values of urea and creatinine in blood before and after the intravenous administration of EE were similar ($p<0.72$), showing EE as a well-tolerated product.

Conclusions: (1) The visualization feasibility of renal arteries improved significantly with the EE use, increasing from 91% to 100% ($p < 0.001$). (2) A new renal-hiliar index (ReHi Index) was introduced, with improved sensitivity and very acceptable specificity in relation to conventional direct parameters like RePSV > 200 cm/s and RAR > 3.5 ($p< 0.0001$). (3) EE showed an excellent security profile in terms of renal tolerance, also allowing its use in patients with deterioration of the renal function.

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CARDIAC FUNCTION BY STRAIN IMAGING: KEY TO THE INCREASED PERFORMANCE CAPACITIES OF ENDURANCE-TRAINED ATHLETES

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Background: To increase the performance capacity of a triathlete (Tri), a variety of adaptations are necessary. The heart is the central and the most important limiting factor. The structural heart adaptations in Tri have important repercussion on cardiac function. The left ventricular diastole shows specific characteristics that determine performance capacity.

Methods: 40 male Tri were compared with 31 active male controls and with 112 patients with ischemic heart disease. All subjects underwent tissue Doppler and strain imaging.

Results: The late diastolic filling period in Tri has specific characteristics. Tissue imaging demonstrated in Tri specific characteristics of both the late passive diastolic filling period and the early active diastolic relaxation period. The significant differences between the three groups concerning the strain values at the basal and the mid septum in the longitudinal axis by aortic valve closure and by mitral valve opening were extremely striking. The values of the end-diastolic strain by the end of the a-wave: negative in Tri, near-zero in normal controls, and marked positive in coronary patients were fascinating (fig. 1).