Duplex Ultrasonography in the Detection of Celiac Axis Stenosis

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Purpose

To assess the predictive value of ultrasound duplex scanning in the detection of celiac axis (CA) stenosis.

Methods and Materials

Celiac axis duplex scans were performed for clinical evaluation before CABG in 39 patients (M: 30, F: 9, 44 to 75 in age) in the supine position with 2–4 MHz convex probes. Subsequent lateral aortographies were performed in all patients after coronary arteriography. CA diameters were measured on lateral aortograms by 2 radiologists blinded to the duplex results, and the original duplex velocity values were evaluated for accurate diagnosis with well-known velocity criteria such as peak systolic velocity (PSV), peak diastolic velocity (PDV) and end diastolic velocity (EDV).

Results

CA stenosis more than 50% in diameter reduction was confirmed in thirteen patients (M: 10, F: 3, 44 to 75 in age) with lateral aortography. PSV in CA stenosis (n=13) was 283±96 cm/sec; EDV 85±49 cm/sec; PDV 55±33 cm/sec, whereas 161±55 cm/sec; 59±21 cm/sec; 32±9 cm/sec in normal CA group, respectively. PSV was significantly different between normal and stenosis group (p<0.01). However, EDV(p=0.054) and PDV(p=0.12) were insignificant. PSV ≥ 250 cm/sec provided sensitivity 77%, specificity 85%, positive predictive value 71%, and negative predictive value 88%. EDV≥50 cm/sec provided low sensitivity (46%), but high specificity (100%). Lowering the EDV threshold (<50 cm/sec) improved sensitivity but reduced accuracy.

Conclusion

Duplex ultrasound is a useful screening method for detection of CA stenosis. The most accurate predictor of the disease was increase of peak systolic velocity.

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