Contrast-Enhanced Ultrasonography in the Evaluation of Crohn's Disease Activity: Correlation With Ileocolonoscopy
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Background: the role of contrast-enhanced ultrasonography (CEUS) for assessing CD activity remains unclear. Our aim was to determine the performance of conventional US and CEUS to detect CD activity assessed by ileocolonoscopy taken as the reference. Methods: twenty patients with small bowel CD were prospectively studied. Clinical disease activity was assessed by the Harvey-Bradshaw Index (HBI). All patients underwent ileocolonoscopy and also a conventional US followed by a CEUS using a microbubble contrast agent (SonoVue®). US examinations were performed using a Hitachi HI VISION Avius®, employing a multi frequency convex abdominal transducer. Disease small bowel activity was assessed by ileocolonoscopy (reference) and patients were graded, for the purpose of statistical analysis, as inactive (normal or mild disease) or active (moderate or severe inflammation). Qualitative and quantitative parameters from the sonographic analysis included maximum wall thickness, vascularity by Doppler US, contrast intraparietal and transparietal enhancements, including the time to the peak enhancement, quantitative contrast enhancement at baseline and at maximum enhancement. Statistics were performed with SPSS v.20.0. Results: disease severity was as follow: no disease in 5 patients (40%), mild in 2 patients (10%), moderate in 1 patient (5%) and severe in 12 patients (60%). Five patients (25%) had been submitted to bowel resection. Among the 18 patients in clinical remission (HBI ≤4 points), 10 patients (56%) had evident signs of inflammatory activity on ileocolonoscopy and 14 patients (78%) in US (bowel wall thickness>4mm). Classic ultrasound parameters (wall thickness >4mm and colour Doppler flow moderate and marked) correlated with disease activity (p=0,01 and p= 0,04). For CEUS, the value of maximum enhancement was related with disease severity (7,25 vs 12,67, p=0,024 and an area under the ROC curve 0,77). There was no correlation with baseline enhancement and time to peak enhancement (p=0,09 and p=0,43). Conclusion: wall bowel thickness, Doppler US and CEUS are valuable parameters for an accurate detection of small bowel inflammatory activity in CD. Contrast-enhanced US could be a useful technique to monitor disease activity in the era where mucosal healing is the treatment goal in CD.