

## Three Dimensional Contrast Enhanced Ultrasonography vs. Magnetic Resonance Imaging in The Diagnosis of IPMN of the Pancreas

Carla Serra<sup>1</sup>, Lucia Calculli<sup>2</sup>, Andrea Imbrogno<sup>1</sup>, Davide Fabbri<sup>1</sup>,  
Fabio Ferroni<sup>2</sup>, Alexandro Paccapelo<sup>1</sup>, Riccardo Casadei<sup>3</sup>, Raffaele Pezzilli<sup>1</sup>

<sup>1</sup>Pancreas Unit, Department of Digestive Diseases and Internal Medicine,

<sup>2</sup>Department of Radiology and <sup>3</sup>Department of Surgery;

Sant'Orsola-Malpighi Hospital, University of Bologna. Bologna, Italy

**Context** The IPMNs of the pancreas represent a challenge for the imaging. **Objective** To prospectively compare the diagnostic accuracy of three-dimensional contrast enhanced ultrasonography (3D-CEUS) vs. magnetic resonance imaging plus RM cholangio-pancreatography (MRI) in the diagnosis of IPMNs. **Methods** Thirty consecutive IPMN patients (22 F, 8 M, age 67.1±12.2 years, mean±SD; MRI lesion size 13.8±8.3 mm, mean±SD) were studied. The kappa, McNemar and Wilcoxon matched-pairs statistics were applied. **Results** Three patients (10.0%) had no diagnostic 3D-CEUS for technical problems. 3D-CEUS was judged to improve the two-dimensional ultrasonography (2D-US) findings in evaluating the pancreatic lesions in 14 patients (51.9%). Twelve (44.4%) main duct IPMN cases were identified by 3D-CEUS vs. no cases by MRI (P<0.001). IPMN localization showed a poor agreement between 3D-

CEUS and MRI (kappa=0.058), whereas a good agreement was found in detecting the presence of calcifications (kappa=1.000). Significant differences between 3D-CEUS and MRI were found regarding the number of lesions detected (1.4±0.8 vs. 3.8±3.6; P<0.001), the detection of mucinous plugs (3.7% vs. 50.0%; P<0.001), chronic pancreatitis (7.4% vs. 29.6%; P=0.031), pancreatic atrophy (0% vs. 48.1%; P<0.001), high thick septa (22.2% vs. 55.6%; P=0.004) and mural nodules (25.9% vs. 3.3%; P=0.016), while presence of dilation of both the Wirsung duct (40.7% vs. 18.5%; P=0.070) and the secondary duct communicating with the main pancreatic duct (0% vs. 3.3%; P=1.000) were not significant. **Conclusions** The 3D-CEUS compared to 2D-US improves the IPMN diagnosis. It may be utilized to better evaluate these patients after 2D-US examination. MRI remains the gold standard technique.