

CONTRAST-ENHANCED ULTRASONOGRAPHY (CEUS) OF THE PANCREAS

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LEARNING OBJECTIVES: 1) To describe the technique for contrast-enhanced US (CEUS) of the pancreas; 2) to describe CEUS findings that allow characterization and staging of pancreatic disease.

BACKGROUND: Second generation US contrast media have already proven useful in the study of the liver. The study of the pancreas is a new and promising application of CEUS.

IMAGING FINDINGS: CEUS of the pancreas shows marked early parenchymal enhancement (peak: 15-20 seconds) followed by progressive washout. Contrast-enhanced phases can be followed dynamically.

Mass-forming pancreatitis: parenchymographic enhancement. CEUS improves differential diagnosis with ductal adenocarcinoma. Ductal adenocarcinoma: poor enhancement, appears hypoechoic to the adjacent normally enhancing pancreatic tissue. CEUS improves identification, characterization and loco-regional and hepatic staging. Endocrine tumors: bright enhancement, appearing hyperechoic to the adjacent normally enhancing pancreatic tissue. CEUS improves identification, characterization and loco-regional and hepatic staging. Pseudocyst: no intralesional enhancement. Serous cystadenoma: CEUS enhancement of intralesional septa improves identification of microcystic features. Mucinous cystic neoplasm: CEUS helps identify parietal nodules and septa, for the differential diagnosis with pseudocysts.

CEUS allows to study a pancreatic lesion in the arterial and venous phase for characterization and local staging, then after 120 seconds the liver can be examined for the detection of metastases.

CONCLUSION: In this comprehensive review we address the topic of CEUS of the pancreas, discussing examination technique and imaging findings for solid and cystic disease.

CEUS OF THE PANCREAS: WHY SHOULD WE DO IT?

1. US is often the first examination performed in patients with suspicion of pancreatic pathology
2. The greater accuracy of CEUS compared to baseline US can immediately result in better diagnostic workup and treatment planning

TEACHING POINTS

1: in presence of any focal pancreatic mass iso-enhancing to the normal parenchyma at CEUS, FNAC is mandatory for treatment planning.

2: any focal pancreatic mass hypo-enhancing to the normal parenchyma at CEUS should be considered a ductal adenocarcinoma until otherwise proven.

3: endocrine tumors are the first differential diagnosis for any focal pancreatic mass hyper-enhancing to the normal parenchyma at CEUS.

4: the presence of vascularized inclusions in a cystic lesion at CEUS excludes the diagnosis of pseudocyst, and the diagnosis of cystic tumor must be considered.