

ORIGINAL ARTICLE

Assessing the value of endoscopic ultrasound in predicting symptom severity and long-term clinical course in chronic pancreatitis

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Abstract

Background: To date, no studies have evaluated the correlation between number of endoscopic ultrasound (EUS) criteria met for chronic pancreatitis (CP) and symptom severity over the course of the disease. This study assessed the relationship between number of EUS-based diagnostic criteria for CP and CP severity over time.

Methods: A University of Louisville database was queried for patients undergoing EUS due to concern for chronic pancreatitis between 2005 and 2016. Patients were grouped based on EUS criteria met for CP and groups were compared along outcome and procedural variables.

Results: Of a total of 243 patients, 24, 129, and 90 patients met 1–3, 4–5, and ≥ 6 EUS diagnostic criteria, respectively. Median follow-up time was 33 months. Along all follow-up parameters, number of diagnostic criteria was positively correlated with an increased percentage of patients requiring operative intervention for chronic pancreatitis on univariate and multivariate analysis.

Conclusions: In addition to the role of EUS criteria in establishing the diagnostic severity of patients with symptomatic chronic pancreatitis, the number of EUS-based criteria may help predict patients who will eventually require operative intervention and thus prompt referral to a pancreatobiliary surgeon earlier in the course of a patient's disease.

Received 23 March 2017; accepted 30 May 2017

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Introduction

Chronic pancreatitis (CP) represents a complex disease with a very heterogeneous natural history. As a result, its management continues to present a challenge to clinicians. CP involves progressive inflammatory changes in the pancreatic tissue, which lead to permanent structural changes in the gland. In approximately 90–95% of patients, this inflammation results in significant epigastric abdominal pain and, eventually, exocrine and endocrine insufficiency. These in turn cause inadequate oral

intake, fat and nutrient malabsorption, and weight loss.¹ Thus, management of CP largely involves control of these symptoms and physiologic perturbations. Of these, chronic pain remains the most difficult to control, often leading to narcotic dependence, multiple hospitalizations, and decreased quality of life.

In general, pain and symptom management in patients with chronic pancreatitis comprises endoscopic and, in certain cases, operative interventions. Identifying those patients who will suffer from a more aggressive disease process and require more intensive and invasive interventions unfortunately remains quite difficult. Endoscopic ultrasound (EUS) currently represents an effective diagnostic tool that allows for well-validated assessment of the severity of pancreatitis at diagnosis.^{2–9} Diagnosis of CP by

Presented at the 2017 Annual Meeting of the Annual Meeting of the Americas Hepato-Pancreato-Biliary Association, March 29–April 2, Lowes Miami Beach Hotel, Miami Beach, FL, United States.

way of EUS involves evaluating the parenchyma and ductal system of the pancreas for changes consistent with CP. These include ductal changes such as bright duct walls, visible side branches, prominence of main pancreatic duct, duct irregularity, as well as parenchymal changes included stranding, lobularity, calcification (with acoustic shadowing) cystic changes, and bright central foci.¹⁰ However, whether the number of EUS criteria corresponds to a disease process with a more aggressive natural history (i.e. one more likely to be refractory to medical and endoscopic management, to result in more pain-related hospitalizations, etc.) remains unknown. To our knowledge, there has not been a study evaluating the correlation of number of EUS criteria for CP with the natural history of this disease process.

Ultimately, having a predictive tool for long-term disease prognosis in patients with chronic pancreatitis would prove invaluable in guiding progression along the medical to endoscopic to surgical treatment algorithm. Given the use of EUS in diagnosing and classifying chronic pancreatitis, it warrants investigation as a possible predictor of the natural history of the disease. This study sought to identify how EUS criteria correlate with disease-related outcomes as well as the need for endoscopic and operative intervention and thus better guide clinicians in managing patients with chronic pancreatitis.

Methods

Study design

A University of Louisville IRB approved single-institution database consisting of was evaluated from January 2005 to August 2016 for patients undergoing endoscopic ultrasound (EUS) for evaluation of the pancreas in the setting of a clinical diagnosis of chronic pancreatitis. Clinical diagnosis of CP was based on a history of episodes of acute pancreatitis with subsequent attacks and chronic pain in conjunction with CT and MRI evaluations noting pancreatic ductal abnormalities (e.g. dilation or strictures) and parenchymal abnormalities (e.g. calcifications and atrophy). The study was conducted in compliance with the principles and protocol established in the Declaration of Helsinki in accordance with the ICH Harmonized Tripartite Guideline for Good Clinical Practice (GCP).

Endoscopic ultrasound evaluation

Endoscopic ultrasound was performed by a single gastroenterologist, Dr. Stephen A. McClave, at the University of Louisville. For each patient, the pancreas was evaluated with respect to traditional markers for changes associated with scar tissue from chronic pancreatitis.¹⁰ Ductal changes included bright duct walls, visible side branches, prominence of main pancreatic duct

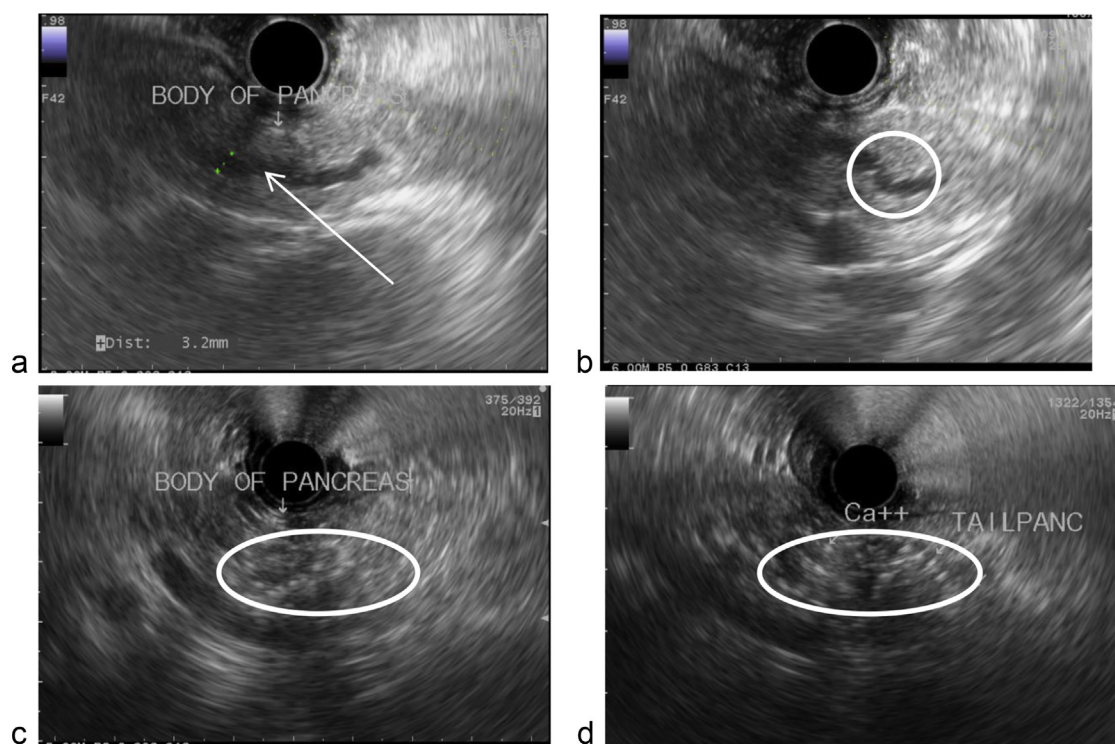


Figure 1 Endoscopic ultrasound findings suggestive of chronic pancreatitis. (A) Main pancreatic duct dilation (arrow). (B) Main pancreatic duct irregularity (circle). (C, D) Hyperechoic foci (calcifications) in the parenchyma of the pancreatic body (C) and tail (D) (circles)

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