Novel quantitative perfusion analysis with contrast-enhanced harmonic EUS for differentiation of autoimmune pancreatitis from pancreatic carcinoma

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Abstract

Objective. Autoimmune pancreatitis (AIP) is often misdiagnosed as pancreatic carcinoma (PC) despite recent advances in imaging tests. The aim of the study was to evaluate whether the quantitative perfusion analysis using software “Time intensity curve” with contrast-enhanced harmonic EUS (CH-EUS) facilitate the differentiation of AIP from PC. Methods. Consecutive patients with focal AIP and pancreatic carcinoma who underwent CH-EUS from January 2009 to September 2010 were analyzed. CH-EUS was performed with intravenous administration of an ultrasonographic contrast (Sonazoid) and electronic radial echoendoscope. The graph of time intensity curve (TIC) for pancreatic mass was generated to depict the changes in signal intensity over time within the region of interest (ROI). ROI was placed to cover an area with a pancreatic mass lesion. Based on the analysis of TIC, base intensity before injection (BI), peak intensity (PI), time to peak, and maximum intensity gain (MIG: PI-BI) were calculated. Results. Eight patients with focal AIP and twenty-two patients with PC were evaluated by TIC. PI and MIG of mass lesion of AIP were significantly higher than that of PC (21.4 dB vs. 9.6 dB, 17.5 vs. 6.6). Receiver operating characteristics analysis yielded an optimal MIG cutoff value of 12.5 with high sensitivity and specificity. Conclusion. Pancreatic mass lesions of AIP and PC exhibited markedly different patterns with the TIC. This novel diagnostic modality using TIC generated by CH-EUS might offer an opportunity to improve accuracy in the differential diagnosis between pancreatic mass lesion of AIP and PC.

Key Words: autoimmune pancreatitis, contrast-enhanced harmonic EUS, pancreatic carcinoma

Introduction

Autoimmune pancreatitis (AIP) is a unique form of chronic pancreatitis with presumed autoimmune etiology. In 1995, Yoshida et al. described AIP as chronic pancreatitis characterized by diffuse swelling of the pancreatic parenchyma and irregular narrowing of the pancreatic duct, periductal lymphoplasmacytic infiltration and fibrosis, and a dramatic response to steroid therapy [1]. Since the first report, AIP with diffuse involvement of pancreatic gland has been reported [2–4]. However, later publications showed that the pancreas could also be focally involved by autoimmune pathology, and the patients with focal AIP demonstrated a painless jaundice in the setting of focal pancreatic mass lesion [5–7]. Focal AIP is often misdiagnosed as pancreatic carcinoma in spite of recent advances in the development of imaging