Original Research

Contrast-enhanced harmonic endoscopic ultrasound using time-intensity curve analysis predicts pathological grade of pancreatic neuroendocrine neoplasm

ABSTRACT

Purpose

Histological grading is important to treat algorism in pancreatic neuroendocrine neoplasms (PNEN). The present study examined the efficacy of contrast-enhanced harmonic endoscopic ultrasound (CH-EUS) and time-intensity curve (TIC) analysis of PNEN diagnosis and grading.

Methods

TIC analysis was performed in 30 patients using data obtained from CH-EUS, and histopathological diagnosis was performed via EUS-guided fine needle aspiration or surgical resection. The TIC parameters were analyzed by dividing them into G1/G2 and G3/NEC groups. Then, patients were classified into non-aggressive and aggressive groups and evaluated.

Results

Twenty-six patients were classified as G1/G2, and 4 as G3/NEC. From the TIC analysis, five parameters of I; echo intensity change, II; time for peak enhancement, III; speed of contrast, IV; decrease rate for enhancement, and V; enhancement ratio for node / pancreatic parenchyma were obtained. Three of these parameters, I, IV and V, showed high diagnostic performance. Using the cutoff value obtained from the receiver operating characteristic (ROC) analysis, the correct diagnostic rates of parameter I, IV and V were 96.7%, 100%, and 100%, respectively, between G1/G2 and G3/NEC. A total of 21 patients were classified into the non-aggressive group, and 9 into the aggressive group. Using the cutoff value obtained from the ROC analysis, the accurate diagnostic rates of I, IV and V were 86.7%, 86.7%, and 88.5%, respectively, between the non-aggressive and aggressive groups.

Conclusion

CH-EUS and TIC analysis showed high diagnostic accuracy for grade diagnosis of PNEN. Quantitative perfusion analysis is useful to predict PNEN grade diagnosis preoperatively.