

MDCT for Pancreatic Intraductal Papillary Mucinous Neoplasms

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Commentary

Intraductal papillary mucinous neoplasms (IPMNs) of the pancreas are a distinct group of mucin-producing epithelial neoplasms that form Intraductal tumor masses. Whether an IPMN is an Intraductal papillary mucinous adenoma, carcinoma, or invasive carcinoma is important because patient care decisions and prognosis are affected by imaging preoperative diagnosis as radiology is the mainstay in preoperative evaluation. Available radiological literature is scanty about these tumors focusing towards benign versus malignant differentiation. Three articles from recent issues of American journal of Roentgenology and Radiology, all highlighting the MDCT evaluation of Intraductal papillary mucinous neoplasms are included. All articles having small sample size ranging from 15-64 but having adequate epidemiological technique and statistical analysis.

The paper by Rahul et al demonstrates that MDCT can differentiate malignant tumor from benign types. Predominant main pancreatic duct involvement and a wide (> 1 cm) connection of a side-branch lesion with the main duct significantly correlated with Intraductal papillary mucinous carcinoma with invasion. Tumor size, main duct diameter, number of tumors per patient, number of pseudoseptations per tumor, common bile duct dilatation, enlarged lymph nodes, Intraductal calcifications, papillary bulging, and presence and size of a solid mass yielded no statistically significant relationship with pathologic subtypes.

Satomi et al concluding that MDCT helped to predict invasive carcinoma associated with IPMNs. Solid mass, dilatation of the common bile duct or common hepatic duct, and the presence of a stent were significantly correlated with the presence of associated invasive carcinoma.

Hiroshi et al concluding that main pancreatic duct diameter of 6 mm or larger, a mural nodule of 3 mm or larger, and an abnormal attenuating area were independently predictive of malignancy. A mural nodule of 6.3 mm or larger in the main duct and an abnormal attenuating area were independently predictive of parenchymal invasion. This study is showing good sensitivity, specificity and accuracy of MDCT for identifying malignancy and invasiveness.

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Pancreatic Intraductal Papillary Mucinous Neoplasms: Role of CT in Predicting Pathologic Subtypes

OBJECTIVE. The objective of our study was to evaluate whether CT can be used to predict the pathologic subtypes of pancreatic intraductal papillary mucinous neoplasms (IPMNs).

MATERIALS AND METHODS. Three radiologists, blinded to the pathologic IPMN subtype, retrospectively and independently reviewed the preoperative CT scans of 38 patients with surgically resected pancreatic IPMN:

11 intraductal papillary mucinous adenomas, 11 intraductal papillary mucinous carcinomas, and 16 intraductal papillary mucinous carcinomas with invasion. The patients, 16 women and 22 men, ranged in age from 38 to 80 years (mean age, 64.3 years). CT findings were correlated with each pathologic subtype using the chi-square (two-sided) test and analysis of variance. Interobserver agreement of the CT diagnosis of pathologic subtype and agreement between the CT diagnosis and pathologic subtype were also studied (kappa statistic).

RESULTS. Predominant main pancreatic duct (MPD) involvement ($p = 0.04$) and a wide (> 1 cm) connection of a side-branch lesion with the MPD ($p = 0.03$) correlated with intraductal papillary mucinous carcinoma with invasion. Tumor size, MPD diameter, number of

tumors per patient, number of pseudoseptations per tumor, common bile duct dilatation, enlarged lymph nodes, intraductal calcifications, papillary bulging, and presence and size of a solid mass yielded no statistically significant relationship with pathologic subtype. Both interobserver agreement of CT diagnosis (range, 0.004–0.359) and agreement between CT diagnosis and pathologic subtype (range, 0.046–0.317) ranged from slight to fair.

CONCLUSION. Prediction of the pathologic subtypes of pancreatic IPMNs by CT is limited. Predominant MPD involvement and a wide connection of a side-branch lesion with the MPD are the only CT findings that can be used to predict the pathologic subtype of pancreatic IPMN.

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MDCT of Intraductal Papillary Mucinous Neoplasm of the Pancreas: Evaluation of Features Predictive of Invasive Carcinoma

OBJECTIVE. The purpose of our study was to evaluate factors predictive of the presence of invasive carcinoma associated with intraductal papillary mucinous neoplasm (IPMN) of the pancreas on MDCT.

MATERIALS AND METHODS. Preoperative MDCT of 36 consecutive patients (23 men, 13 women; mean age, 66.6 years) who had undergone surgical resection and had a pathologic diagnosis of IPMN were retrospectively assessed. CT was performed with a 4-MDCT scanner with 120 mL of IV contrast material at an injection rate of 3 mL/sec. Arterial and venous phase images were acquired at 25 and 50–60 sec from the start of IV contrast administration. Type of ductal involvement, location, tumor size in branch duct type and combined type lesions, caliber of the main pancreatic duct, caliber of the common bile duct or common hepatic duct, and solid appearance of the lesion were assessed on CT and correlated with pathologic findings for invasive carcinoma.

RESULTS. Pathologic analysis revealed carcinoma in situ in seven patients (19%) and invasive carcinoma in 15 patients (42%) arising from the IPMN. With invasive carcinoma, the size of the tumor in branch duct type and combined type, and the caliber of the main pancreatic duct were significantly larger compared with the lesions without invasive carcinoma (4.7 ± 1.7 cm vs 2.6 ± 1.4 cm [$p = 0.0007$] and 9.3 ± 5.5 mm vs 4.6 ± 4.1 mm [$p = 0.006$], respectively). A solid mass ($p < 0.001$), dilatation of the common bile duct or common hepatic duct (> 15 mm), and the presence of a stent ($p = 0.0004$) were correlated with the presence of associated invasive carcinoma.

CONCLUSION. MDCT helped to predict invasive carcinoma associated with IPMN.

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Intraductal Papillary Mucinous Neoplasm of the Pancreas: Assessment of the Likelihood of Invasiveness with Multisection CT

PURPOSE. To evaluate the capabilities of multisection computed tomography (CT) in determining the likelihood of invasiveness of intraductal papillary mucinous neoplasm (IPMN).

MATERIALS AND METHODS. The institutional review board approved this research and waived informed consent from the patients. Two radiologists blinded to the pathologic assessment of malignancy or parenchymal invasion of IPMN retrospectively evaluated CT images of 61 consecutive surgically resected tumors (26 adenomas, 15 noninvasive carcinomas, and 20 invasive carcinomas) in patients who underwent multiphase contrast material-enhanced CT with 0.5- or 1-mm collimation. The findings were statistically analyzed by using univariate and multivariate analyses, with the optimal cutoff levels of each continuous parameter determined by generating receiver operating characteristic curves.

RESULTS. The following findings showed significant differences among the three groups: maximum diameter

of the main pancreatic duct (MPD), size (length of major axis) of the largest mural nodule in the MPD or in any associated cystic lesion, abnormal attenuating area in the surrounding parenchyma, calcification in the lesion, protrusion of the MPD into the ampulla of Vater, and bile duct dilatation. An MPD diameter of 6 mm or larger, a mural nodule of 3 mm or larger, and an abnormal attenuating area were independently predictive of malignancy. A mural nodule of 6.3 mm or larger in the MPD and an abnormal attenuating area were independently predictive of parenchymal invasion. According to these criteria, the sensitivity, specificity, and accuracy for identifying malignancy were 83%, 81%, and 82% and for identifying parenchymal invasion were 90%, 88%, and 89%, respectively.

CONCLUSION. Multisection CT is useful for distinguishing among adenoma, noninvasive carcinoma, and invasive carcinoma in patients with IPMN.