Diagnostic value of a pancreatic mass on computed tomography in patients undergoing pancreatoduodenectomy for presumed pancreatic cancer

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Introduction. *Previous studies have shown that 5–14% of patients undergoing pancreatoduodenectomy for suspected malignancy ultimately are diagnosed with benign disease. A "pancreatic mass" on computed tomography (CT) is considered to be the strongest predictor of malignancy, but studies describing its diagnostic value are lacking. The aim of this study was to determine the diagnostic value of a pancreatic mass on CT in patients with presumed pancreatic cancer, as well as the interobserver agreement among radiologists and the additional value of reassessment by expert-radiologists.*

Methods. *Reassessment of preoperative CT scans was performed within a previously described multicenter retrospective cohort study in 344 patients undergoing pancreatoduodenectomy for suspected malignancy (2003–2010). Preoperative CT scans were reassessed by 2 experienced abdominal radiologists separately and subsequently in a consensus meeting, after defining a pancreatic mass as "a measurable space occupying soft tissue density, except for an enlarged papilla or focal steatosis".*

Results. *CT scans of 86 patients with benign and 258 patients with (pre)malignant disease were reassessed. In 66% of patients a pancreatic mass was reported in the original CT report, versus 48% and 50% on reassessment by the 2 expert radiologists separately and 44% in consensus (*$P < .001$ *vs original report). Interobserver agreement between the original CT report and expert consensus was fair (kappa = 0.32, 95% confidence interval 0.23–0.42). Among both expert-radiologists agreement was moderate (kappa = 0.47, 95% confidence interval 0.38–0.56), with disagreement on the presence of a pancreatic mass in 29% of cases. The specificity for malignancy of pancreatic masses identified in expert consensus was twice as high compared with the original CT report (87% vs 42%, respectively). Positive predictive value increased to 98% after expert consensus, but negative predictive value was low (12%).*

Conclusion. *Clinicians need to be aware of potential considerable disagreement among radiologists about the presence of a pancreatic mass. The specificity for malignancy doubled by expert radiologist reassessment when a uniform definition of "pancreatic mass" was used. (Surgery 2015;158:173-82.)*

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In patients with suspected pancreatic or periampullary cancer, differentiation between malignant and benign disease can be difficult. Clinically, benign diseases, such as various types of pancreatitis, can mimic pancreatic malignancy because both may present with symptoms as jaundice and weight loss. Also, on imaging, groove pancreatitis and other types of (chronic) pancreatitis can be mistaken for pancreatic carcinoma as the result of pseudotumor formation.[1-5] Similarly, autoimmune pancreatitis can mimic distal cholangiocarcinoma when the bile ducts are involved (sclerosing cholangitis), and discrimination between the different types of cystic pancreatic lesions remains challenging, despite improvements in imaging techniques.[2,6,7] Tumor markers or immunoglobulin levels are currently not specific enough to differentiate between malignant and benign disease. Consequently, approximately 5–14% of patients undergoing pancreatoduodenectomy for suspected malignancy will ultimately have benign disease.[8,9]

In symptomatic patients (eg, with jaundice and weight loss), a resectable pancreatic mass on computed tomography (CT) and/or endoscopic ultrasonography (EUS) frequently is sufficient to proceed to surgery, because pancreatoduodenectomy is the only curative option for patients with pancreatic or periampullary cancer and malignancy cannot be excluded otherwise. This commonly accepted policy is endorsed by the recent International Study Group of Pancreatic Surgery consensus statement on pancreatoduodenectomy in the absence of histology.[9] The International Study Group of Pancreatic Surgery recommends that in the presence of a solid mass in the head of the pancreas, which is suspicious for malignancy, histo- or cytopathologic proof is not required before proceeding with pancreatoduodenectomy.

Currently, CT is the imaging modality of choice in patients with suspected pancreatic cancer, because it can identify and localize the primary tumor, determine resectability, and detect distant metastases.[10] Although several studies have focused on the diagnostic accuracy of CT in the detection, staging, and resectability of pancreatic cancer,[11] there is a lack of data on the diagnostic value of a pancreatic mass on CT in the differentiation between malignant and benign disease, even though clinical decision making strongly depends on this finding. The proportion of patients with benign disease undergoing pancreatoduodenectomy for suspected malignancy on the basis of the presence of a pancreatic mass on CT is therefore unknown. In addition, there is a discrepancy in the reporting of a pancreatic mass. Sometimes, not only a visible lesion but also indirect signs of tumor invasion (eg, duct obstruction) are considered as a "pancreatic mass," since up to 20% of pancreatic adenocarcinoma present as an isoattenuating lesion on CT.[12-14] Recent guidelines on standardized radiology reporting in cases of pancreatic adenocarcinoma also lack a clear definition of a pancreatic mass.[15] Hence, the interobserver agreement may be lower than generally assumed, but studies on interobserver variability among radiologists are lacking. Furthermore, it is unknown which additional value can be obtained by expert reassessment of CT scans for the presence of a pancreatic mass.

The aim of this study was to determine the diagnostic value of a pancreatic mass on CT in patients with presumed pancreatic cancer. In addition, we aimed to determine the interobserver agreement among radiologists and the additional value of CT reassessment by experienced abdominal radiologists for the presence of a pancreatic mass.

METHODS

Patients. We performed a retrospective analysis within the dataset of a previously published multicenter cohort study in patients undergoing pancreatoduodenectomy between January 2003 and July 2010 in 11 medium- to high-volume centers in the Netherlands.[8] In this study, all adult patients who underwent either a pyloric-preserving pancreatoduodenectomy or a classic Whipple for suspected malignancy were included. This suspicion was either based on a pancreatic mass identified