Comparison between multislice CT and MR imaging in the diagnostic evaluation of patients with pancreatic masses

Confronto fra TC multistrato e RM nella valutazione diagnostica dei pazienti con masse pancreatiche

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Abstract

Purpose. This study compared the results of multislice computed tomography (MSCT) and high-field magnetic resonance imaging (MRI) in the diagnostic evaluation of pancreatic masses.

Materials and methods. Forty patients with clinical and ultrasonographic evidence of pancreatic masses underwent MSCT and MRI. The majority of patients (31/40, 78%) had proven malignant pancreatic tumours (24 ductal adenocarcinoma, six mucinous cystadenocarcinoma, one intraductal papillary mucinous carcinoma), whereas the remaining patients (9/40, 22%) were found to have benign lesions (eight chronic pancreatitis, one serous cystadenoma). Results of the imaging studies were compared with biopsy (n=33) and/or histology (n=7) findings to calculate sensitivity, specificity, accuracy and positive (PPV) and negative (NPV) predictive value for correct identification of tumours and evaluation of resectability of malignancies.

Results. Both for tumour identification and resectability, MSCT and MRI had comparable diagnostic accuracy, with no statistically significant differences between them. Tumour identification CT/MRI: accuracy 98/98%, sensitivity 100/100%, specificity 88/88%, PPV 97/97%, NPV 100/100%; tumour resectability CT/MRI: accuracy 94/90%, sensitivity 92/88%, specificity 100/100%, PPV 100/100%, NPV 78/70%.

Conclusions. MRI represents a valid diagnostic alternative to CT in the evaluation of patients with pancreatic masses, both for correct identification and characterisation of primary lesions and to establish resectability in the case of malignancies. New high-field MRI equipment allows
optimal imaging quality with good contrast resolution in evaluating the upper abdomen.

**Keywords** Computed tomography · Magnetic resonance · Pancreatic masses · Identification · Resectability

**Conclusioni.** La RM rappresenta una valida alternativa diagnostica all’esame TC nei pazienti con lesioni espansive del pancreas; in particolare, la RM consente sia la corretta identificazione e caratterizzazione delle masse pancreatiche che la valutazione dell’eventuale resecabilità chirurgica in caso di malignità; l’alto campo magnetico delle nuove apparecchiature permette di ottenere un’ottima qualità delle immagini RM che mostrano un’elevata risoluzione di contrasto nello studio dell’addome superiore.

**Parole chiave** Tomografia computerizzata · Risonanza magnetica · Masse pancreatiche · Identificazione · Resecabilità

**Introduzione**

Noninvasive evaluation of pancreatic masses relies on several imaging modalities, such as ultrasonography, computed tomography (CT), magnetic resonance (MR) imaging and CT combined with positron emission tomography (PET-CT) [1, 2]. Technological advances in the field of CT have led to the development of multislice or multidetector imaging, with considerable improvements in the technique’s diagnostic potential [3]. Moreover, MR imaging has been proposed as an alternative to CT, as the new high-magnetic-field scanners offer optimal contrast resolution for studying the upper abdomen [3]. The choice between CT and MR imaging for diagnostic evaluation of pancreatic masses is controversial, as the majority of studies in the literature suggests that CT and MR imaging have comparable diagnostic accuracy [4–9], whereas other studies report conflicting results [10–13].

Pancreatic masses are solid or cystic expansile lesions that may be benign or malignant. The most common (95%) malignancy is ductal adenocarcinoma, which arises more frequently in the pancreatic head and rarely in the body or tail [14–17]. Patients with pancreatic adenocarcinoma present with nonspecific, subtle symptoms, and serological makers have little diagnostic significance, so that only 30% of tumours are potentially resectable at the time of diagnosis. The main diagnostic issues in patients with suspected pancreatic tumour are to identify the lesion and establish its surgical resectability. Surgery is in fact not an option in cases of invasion of vascular structures of the splenic-mesenteric-portal axis, especially of the superior mesenteric vein due to its close proximity to the pancreatic parenchyma, and in cases of advanced disease with hepatic, nodal, peritoneal and/or distant metastases.

The aim of our study was to compare the results of multi-