Clinical and CT imaging features of pancreatic acinar cell carcinoma

Aspetti clinici e TC del carcinoma a cellule acinari del pancreas

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Abstract
Purpose. This study was undertaken to analyse the clinical characteristics and computed tomography (CT) imaging features of patients with pancreatic acinar cell carcinoma and to clarify characteristic imaging features.

Materials and methods. Clinical and CT imaging records of ten patients with pancreatic acinar cell carcinoma (three women and seven men; mean age, 58 years) examined using multidetector CT scanners were retrospectively studied. CT features emphasised included lesion location, size, shape, margin, solid or cystic component, density and enhancement. Imaging results were correlated with intraoperative surgical and pathological results.

Results. Lesions were distributed throughout the pancreatic head (n=3), body (n=3), tail (n=2) and both body and tail (n=2). The average diameter was 6.1 cm, varying from 2.3 cm to 15.8 cm. The tumours were round or oval (n=7) or lobular (n=3). Seven tumours appeared as enhanced solid pancreatic masses, with the large masses having hypodense areas; three had >75% cystic component; seven (70%), including four solid and three cystic masses, had well-circumscribed or partially well-defined thin, enhanced encapsulation. After contrast injection, the masses presented heterogeneous enhancement.

Conclusions. Acinar cell carcinoma should always be considered when a large pancreatic mass with typical imaging is found in solid masses with variably sized central cystic areas or cystic masses.

Keywords CT · Acinar cell carcinoma · Pancreas · Cystic mass · Mural nodules

Obiettivo. Lo scopo di questo studio è stato quello di analizzare le caratteristiche cliniche e di imaging TC dei pazienti con carcinoma a cellule acinar del pancreas e di chiarire le caratteristiche imaging del carcinoma a cellule acinar.

Materiali e metodi. Sono stati retrospettivamente esaminate gli aspetti clinici e di imaging TC di 10 pazienti con diagnosi di carcinoma a cellule acinar del pancreas (tre femmine e sette maschi, età media 58 anni) sottoposti ad esame TC multidetettore. Le caratteristiche TC analizzate hanno incluso sede, dimensione, forma, margini, componente solida o cistica, densità ed enhancement delle lesioni. Gli aspetti dell’imaging sono stati quindi correlati con i risultati intraoperatori chirurgici e patologici.

Risultati. La sede delle lesioni è risultata ubiquitaria a livello di testa (n=3), corpo (n=3), coda (n=2), e sia di corpo che coda (n=2) del pancreas. Il diametro medio della lesione è risultato pari a 6,1 cm, compreso tra 2,3 cm e 15,8 m. I tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3). Sette tumori sono risultati di forma rotonda o ovale (n=7) o lobulare (n=3).

Conclusioni. La diagnosi di carcinoma a cellule acinar dovrebbe essere presa in considerazione nel caso di lesioni pancreatiche solide di grandi dimensioni con caratteristiche imaging tipiche e presenza di aree centrali cistiche di dimensioni variabili.

Parole chiave TC · Carcinoma a cellule acinar · Pancreas · Massa cistica · Noduli murali
**Introduction**

Acinar cell carcinoma (ACC) is a rare neoplasm of the pancreas originating from acinar elements of the exocrine pancreas, accounting for approximately 1% of nonendocrine tumours [1, 2]. Given its rarity, the clinical and imaging appearance, treatment and outcome of this disease have not been fully investigated; case reports, multicentre studies, small-scale studies and relatively limited literature reviews represent the available literature on this disease [3–7]. However, previously published papers mostly focus on clinicopathological features, and radiological characteristics have not yet been fully clarified. In addition, imaging manifestations of ACC show a solid mass with a varying proportion of cystic components and a thin, enhanced capsule [8–11]. Interestingly, there is a high incidence of cystic ACC lesions in the hospital with which the authors are affiliated. Thus, imaging features and clinical characteristics of ten patients with ACC, including both solid and cystic masses verified by surgery and pathology, are delineated and discussed to help radiologists become more proficient with recognising ACC and thus providing more accurate diagnosis.

**Materials and methods**

**Clinical data**

The protocol for this study was approved by the Institutional Review Board of our institution, and informed consent for this retrospective study was acquired from the patients. The records of ten patients diagnosed with pancreatic ACC (seven men and three women; age range 38–71 years) from January 2004 to June 2011 were reviewed. The available clinical manifestations, as well as surgical and pathological reports were reviewed. After their operations, patients were assessed clinically and with ultrasonography (US), as well as with multidetector computed tomography (MDCT) on follow-up, which ranged from 2 to 58 (mean, 30) months.

**CT examination**

CT examinations were performed for all ten patients using a LightSpeed VCT 64 (GE Medical Systems, Milwaukee, WI, USA). All patients were administered 500–800 ml of water 30 min prior to CT scan and an additional 250–300 ml immediately prior to the study to achieve adequate gas- tric and duodenal distension. A total of 80–130 ml of non-ionic iodinated contrast material (Omnipaque 300 mg I/ml, GE Healthcare) was injected intravenously at a rate of 2.5–3.5 ml/s with a power injector (Ulrich Medical, Ger-

many) through an 18-gauge intravenous catheter inserted into the antecubital vein. The volume of contrast material delivered was 1.5–2 ml/kg body weight. A 15 ml flush of normal saline solution was administered immediately after the contrast material injection. Three patients underwent dual-phase CT scans during the unenhanced, pancreatic and hepatic venous phases, whereas the other seven underwent triple-phase CT during the same phases. Delay times of arterial, pancreatic and hepatic venous phases were 20–25, 35–45 and 65–75 s, respectively, from the beginning of intravenous infusion. The major scanning parameters were as follows: 100–120 kV, 250 mA, 1.0–1.5 pitch, 0.625- to 4-mm collimation, with slice thickness and intervals of 2.5–5 mm. Coronal and sagittal multiplanar images were also reconstructed from the axial CT data set.

**Imaging analysis**

Two readers independently reviewed MDCT images on a Picture Archiving and Communication System (PACS) workstation. Both readers were fellowship-trained abdominal radiologists with >10 years of experience in reading pancreatic CT images. Final decisions were made by consensus. Imaging features comprised:

- location (head, neck, body, tail);
- size;
- shape;
- margin and enhanced capsule;
- fraction composed of solid versus cystic material (greater or less than 50% solid);
- internal attenuation characteristics on enhanced arterial and pancreatic phase images compared with surrounding pancreatic tissue (hypoattenuation, isoattenuation or hyperattenuation);
- enhancement pattern (peripheral, complete, mural nodule);
- calcification (present or absent);
- biliary and pancreatic ductal dilatation.

Local invasion, vascular encasement, and metastasis were also recorded by each reader. If the radiological and pathological evaluations differed, the pathologic evaluation was considered final.

**Pathological technique**

All the pathology specimens were reviewed retrospectively by two pathologists. All specimens were fixed in 10% neutral-buffered formaldehyde solution and embedded in paraffin wax. Haematoxylin and eosin (H&E) staining was performed, and macroscopic appearances of each resected segment were analysed with photomicrographs; analysis comprised location, size, shape and edge.