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Original Article

Diagnostic Yield of Pancreatic Percutaneous Puncture Depending on the Size of the Lesion[☆]

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ABSTRACT

Introduction: The aim of the present study was to study the diagnostic efficacy of the percutaneous puncture of pancreatic tissue.

Material and methods: A retrospective study was conducted on patients with suspicion of pancreatic neoplasm, and with a percutaneous biopsy of pancreatic tissue, from 2000 to 2011. For the statistical comparative analysis, the sample was stratified by tumor size: ≤3 cm and >3 cm.

Results: A total of 90 biopsies were performed. Pancreatic neoplasm diagnosis was made in 47 cases (52%), with 16 false negatives (18%), no false positives, and chronic pancreatitis in 24 cases (27%). The efficacies of the test results were: an overall sensitivity of 75% (95% CI: 62%–85%), a specificity of 100% (95% CI: 87%–100%), a positive predictive value of 100% (95% CI: 92%–100%), and a negative predictive value of 63% (95% CI: 46%–77%). For tumor sizes ≤3 cm the sensitivity was 70% (95% CI: 45%–88%), with a specificity of 100% (95% CI 66%–100%), a positive predictive value of 100% (95% CI: 76%–100%), and a negative predictive value 60% (95% CI: 32%–83%). For tumors greater than 3 cm, the sensitivity was 88% (95% CI: 70%–98%), the specificity was 100% (95% CI: 75%–100%), with a positive predictive value of 100% (95% CI: 85%–100%) and a negative predictive value of 81% (95% CI: 54%–96%).

Conclusions: Pancreatic percutaneous biopsy efficacy was strongly determined by lesion size. For tumor sizes less than 3 cm, the sensitivity and negative predictive value are unacceptably low, as negative results would not be reliable.

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Rentabilidad diagnóstica de la punción percutánea pancreática en función del tamaño de la lesión

RESUMEN

Palabras clave:
Páncreas

Introducción: El objetivo del presente estudio fue analizar la eficacia diagnóstica de la punción percutánea de tejido pancreático.

Material y métodos: Estudio retrospectivo de pacientes con sospecha de neoplasia de origen pancreático, con biopsia percutánea de tejido pancreático, desde el 2000 hasta el 2011. Para el análisis estadístico comparativo se estratificó la muestra por tamaño, en menores o iguales a 3 cm frente a mayores.

Resultados: Se realizaron un total de 90 biopsias. Se llegó al diagnóstico de neoplasia pancreática en 47 casos (52%), 16 falsos negativos (18%), 0 falsos positivos y al de pancreatitis crónica en 24 casos (27%). Los resultados de rendimiento de la prueba fueron: sensibilidad (S) global del 75% (intervalo de confianza [IC] 95%: 62–85%), especificidad (E) del 100% (IC 95%: 87–100%), valor predictivo positivo (VPP) del 100% (IC 95%: 92–100%) y valor predictivo negativo (VPN) del 63% (IC 95%: 46–77%). En masas ≤3 cm la S fue del 70% (IC 95%: 45–88%), la E del 100% (IC 95%: 66–100%), el VPP del 100% (IC 95%: 76–100%) y el VPN 60% (IC 95%: 32–83%). Frente a masas mayores de 3 cm que presentaron una S del 88% (IC 95%: 70–98%), una E del 100% (IC 95%: 75–100%), un VPP del 100% (IC 95%: 85–100%) y un VPN del 81% (IC 95%: 54–96%).

Conclusiones: La rentabilidad de la biopsia percutánea pancreática está fuertemente condicionada por el tamaño de la lesión. Para tamaños tumorales menores de 3 cm la sensibilidad y el valor predictivo negativo son inaceptablemente bajos, por que lo que resultados negativos no serían fiables.

Introduction

Pancreatic cancer is the fourth leading cause of cancer death in developed countries.[1–4] Despite new diagnostic and therapeutic strategies, the prognosis of this neoplasm is still dire: overall 5-year survival is less than 5%.[3,5–7] In patients with resectable neoplasms, surgery is the therapy that obtains the best results, and percutaneous biopsy is unnecessary. However, less than 20% of patients with pancreatic neoplasm are candidates for surgical treatment, and therefore percutaneous biopsy plays an important role.[3,8–10]

In several international publications,[1,2,11–13] percutaneous needle biopsy (guided by either ultrasound or computed tomography) reached sensitivities (S) and negative predictive values (NPV) of around 70%, and specificities (E) and positive predictive values (PPV) close to 100%. It is a simple and inexpensive technique with a low rate of complications.

The aim of this study was to determine the diagnostic efficacy of percutaneous needle biopsy of pancreatic tissue, analyzing the S, E, and predictive values of the test in our hospital.

Material and Methods

This was a retrospective study that reviewed the medical records of patients with clinical and radiological suspicion of pancreatic neoplasm who underwent pancreatic tissue biopsy between January 1, 2000 and December 31, 2011.

The inclusion criterion was: suspected pancreatic neoplasm (based on symptoms and imaging tests) that was initially not treatable with surgery. Exclusion criteria were: resectable pancreatic masses with indication for surgery, or pancreatic neoplasms with biopsy (percutaneous or surgical) in other locations without biopsy of pancreatic tissue.

The different variables used for the present study were: age, sex, size and location of the pancreatic mass, pancreatic biopsy (percutaneous, excisional or incisional surgical), pathology study and definitive diagnosis.

The definitive diagnosis of pancreatic neoplasm was considered as those patients with biopsy that was positive for cancer, both percutaneous (pancreatic tissue or possible metastases) as well as incisional surgical biopsy, or from the definitive surgical specimen. Likewise, also included in the study were those patients with clinical evolution compatible with a neoplastic process.

The remaining patients who did not meet the above criteria were diagnosed with chronic pancreatitis.

In all cases, we carried out both cytology and fine-needle biopsy of pancreatic tissue under local anesthesia, taking 2 different samples, one with an 18 G needle and another with a 20 G needle, respectively, guided by either real-time ultrasound or CT. The result was considered positive if both tests were positive or if only the biopsy was positive, uncertain if the cytology was positive and the biopsy negative, and negative if both were negative.

For the statistical analysis, only the total number of biopsies was considered. Thus, 2 biopsies in one same patient were analyzed as 2 different procedures. An analysis was done by intention to treat. For the different calculations, the patients were stratified into 2 groups: one according to size (diameter less than or equal to 3 cm versus larger diameters) and the other according to the location of the pancreatic mass (head and uncinate process versus body and tail).

As measurements of the efficacy of this diagnostic test, we used the S, Sp, PPV, NPV and ROC of the different subgroups with their corresponding 95% confidence intervals.

The different analyses were done using the STATA v11 statistical package.

Results

During the 11 years of the study, 81 patients underwent pancreatic tissue biopsy: 49 men (60%) and 32 women (40%), with a mean age of 64 (range 32–89). The most frequent