Pancreatic cancer with portal vein invasion diagnosed by endoscopic ultrasound

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An 82-year-old woman with abdominal pain for the preceding 6 months was referred for endoscopic ultrasound (EUS) to evaluate the presence of pancreatic cancer. The patient had a history of diabetes and hypertension. A computed tomography (CT) scan showed a nodular image on the pancreatic body, hypovascularized, measuring 2.5 cm × 2.0 cm, without signs of vascular involvement [Figure 1]. It was also observed, nodular images on the liver, the visceral peritoneum and peri-hepatic lymphonodes.

One month later, the patient underwent an EUS that showed a hypoechoic heterogeneous lesion in the body of the pancreas, measuring 4.0 cm × 3.5 cm, with vascular invasion of the portal vein [Figure 2]. Nodular masses in the visceral peritoneum and moderate ascites were also observed [Figure 3]. An EUS fine-needle aspiration of the pancreatic mass was performed with a 22-guage Echo-Tip® needle (Cook Medical Inc., Limerick, Ireland) [Figure 4] and a sufficient cytology material was obtained after three punctures, suggesting malignant cells [Figure 5]. After discussion with the surgery department, it was opted to perform a celiac plexus neurolysis, by injecting absolute alcohol (20 mL) and lidocaine (5 mL) through a fenestrated needle on the celiac plexus.

The optimal approach to preoperative imaging assessment of pancreatic cancer remains unclear in the literature. In a prospective study, Soriano et al.,[1] demonstrated that helical CT had the highest accuracy in assessing extent of primary tumor (73%), locoregional extension (74%), vascular invasion (83%), distant metastases (88%), tumor TNM stage (46%), and tumor resectability (83%), whereas EUS had the highest accuracy in assessing tumor size and lymph node involvement (65%). Furthermore, in a retrospective analysis conducted by Zhang et al.,[2] CT angiography, can provide reliable information for vascular involvement and general resectability of pancreatic malignant tumors.

On the other hand, in a retrospective study conducted by Buchs et al.,[3] EUS was the most valuable imaging modality in assessing vascular invasion (especially

Figure 1. Computed tomography images of the pancreatic lesion without vascular invasion

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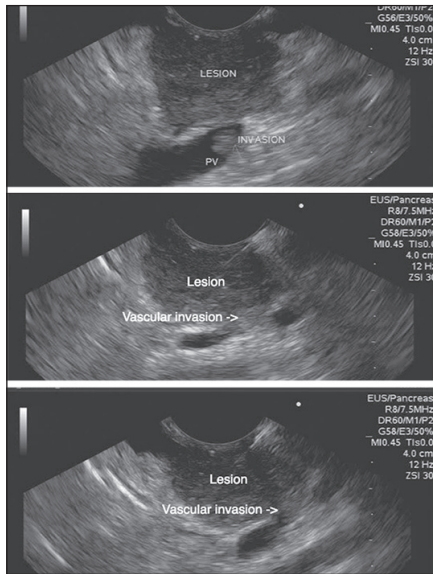
Figure 2. Endoscopic ultrasound view of a hypoechoic lesion in the body of the pancreas with portal vein invasion

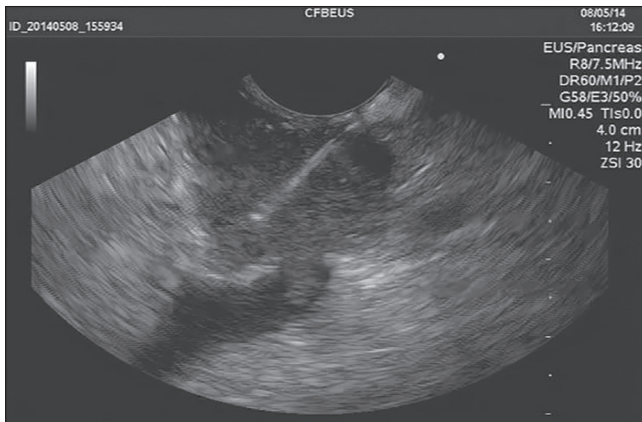**Figure 4.** Endoscopic ultrasound (EUS) view of EUS fine-needle aspiration

Figure 3. Endoscopic ultrasound view of nodular images in visceral peritoneum and ascitis
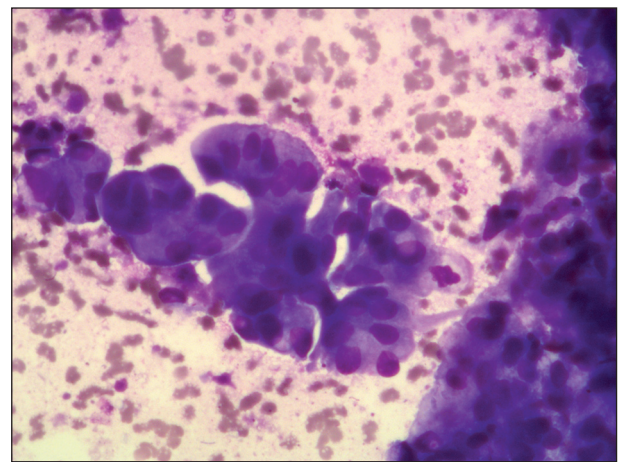
Figure 5. Cytology smear suggesting malignant cells

for venous invasion) for pancreatic cancer, with an accuracy of more than 80%. In a 2013 meta-analysis,[4] with a total of 1330 patients, CT scan showed lower sensitivity than EUS for vascular invasion (58% *vs*. 86%); however, the specificities for vascular invasion (95% *vs*. 93%) were comparable in studies where both imaging techniques were performed. In other systematic review published in 2007, Puli *et al*.,[5] showed that the pooled sensitivity of EUS in diagnosing vascular invasion was 73% and the pooled specificity was 90.2%.

The patient underwent a CT scan as CT angiography was not available, but no signs of vascular involvement were observed. Although the EUS didn't change the treatment on this case, it was possible to demonstrate a portal vein invasion, proceed histological diagnosis and perform celiac plexus neurolysis.
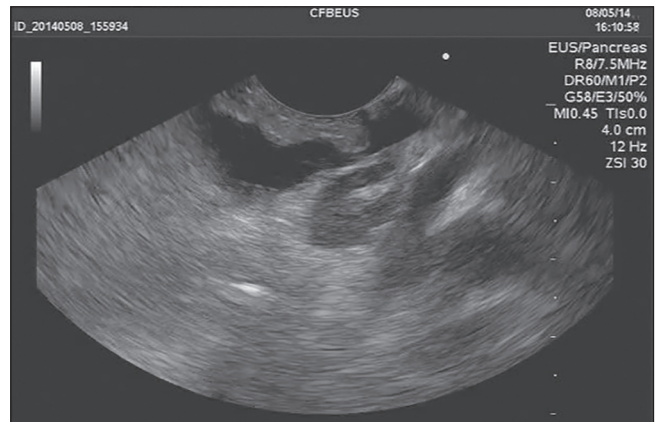
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