

[CASE REPORT]

Seeding of a Tumor in the Gastric Wall after Endoscopic Ultrasound-guided Fine-needle Aspiration of Solid Pseudopapillary Neoplasm of the Pancreas

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Abstract:

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) is widely used as a first-line procedure for the definitive diagnosis of pancreatic solid tumor. Adverse events associated with the EUS-FNA procedure include acute pancreatitis, bleeding, infection, and duodenal perforation. Rarely, pancreatic tumors disseminate in the peritoneal cavity or seed in the gastric wall via the biopsy needle tract after EUS-FNA. Such seeding has been noted primarily in cases of adenocarcinomas and has not been associated with solid pseudopapillary neoplasm (SPN), a rare and potentially malignant tumor of the pancreas. This is the first report of a case of tumor seeding in the gastric wall after EUS-FNA of pancreatic SPN.

Key words: endoscopic ultrasound-guided fine-needle aspiration, solid pseudopapillary neoplasm, needle tract seeding

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Introduction

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) is widely used as a first-line procedure for the definitive diagnosis of pancreatic solid tumor (1) and known to be associated with few serious complications (2-5). The rate of adverse events related to the EUS-FNA procedure is reportedly 0.98% to 3.4%, with events including acute pancreatitis, bleeding, infection, and duodenal perforation (2-5). Rarely (5, 6), pancreatic tumors disseminate in the peritoneal cavity or seed in the gastric wall via the biopsy needle tract after EUS-FNA (7-10). Such seeding has been noted primarily in cases of adenocarcinomas (5, 8, 9, 11) and has not been associated with solid pseudopapillary neoplasm (SPN), a rare and potentially malignant tumor of the pancreas (12-14).

This is the first report of a case of tumor seeding in the gastric wall after EUS-FNA of pancreatic SPN (15).

Case Report

A 78-year-old man admitted to our hospital with abdominal discomfort of 3 months' duration had undergone abdominal ultrasonography 67 months earlier that revealed a tumor in the body of the pancreas and subsequent dynamic contrast-enhanced computed tomography (CT) that demonstrated a hypovascular tumor 6 cm in diameter with a cystic or necrotic component and no calcification (Fig. 1). At that time, EUS-FNA was performed to confirm the diagnosis, and a biopsy specimen was obtained by puncturing through the posterior gastric wall using a 22-gauge needle 4 times with no suction. A pathological examination of the specimen suggested malignancy, so the patient underwent surgical resection of the tumor, and a final pathological diagnosis of SPN of the pancreas was obtained (Fig. 2).

At the current presentation, more than five years later, upper gastrointestinal endoscopy to evaluate the patient's pro-

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longed abdominal discomfort revealed a protruding tumor in the posterior gastric wall (Fig. 3), and subsequent dynamic contrast-enhanced CT showed a hypervascular tumor 4 cm in diameter in the same location (Fig. 4). Positron emission tomography showed a mildly increased uptake of fluorodeoxyglucose by the tumor (maximum standardized uptake value: 4.7), and there was no evidence of metastasis (images not shown).

The tumor markers (carcinoembryonic antigen and carbohydrate antigen 19-9) were within normal limits. A pathological examination of a biopsy specimen from the gastric tumor revealed atypical cells with some apoptosis that suggested malignancy; the patient therefore underwent distal gastrectomy, and the surgically resected gastric specimen revealed a well-defined solid tumor in the submucosal layer of the gastric wall. A pathological examination revealed glandular and alveolar proliferation of atypical cells and hemorrhagic changes on Hematoxylin and Eosin staining with distinct nuclear and cytoplasmic positive staining of beta-

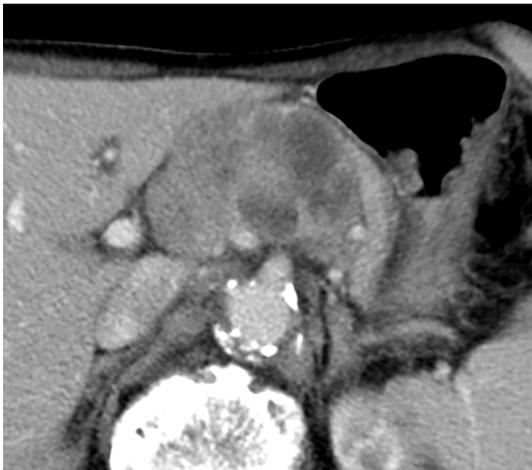


Figure 1. Preoperative abdominal contrast-enhanced computed tomography shows a hypovascular tumor 6 cm in diameter with a cystic or necrotic component in the body of the pancreas.

catenin on immunostaining, findings consistent with SPN (Fig. 5). Matching the location of the tumor in the gastric wall with the puncture route of the EUS-FNA performed 67 months earlier suggested that the current tumor represented seeding of the earlier tumor along the biopsy tract of EUS-FNA.

Discussion

EUS-FNA is a safe procedure with a low incidence of adverse events and low risk of morbidity and mortality (2, 16). Seeding of a pancreatic tumor to the gastric wall through the biopsy needle track after EUS-FNA is uncommon but has been reported in cases of pancreatic adenocarcinoma (5, 7-9, 11, 17-19) and intraductal mucinous papillary carcinoma (10, 20).

In many cases, recurrence of needle tract seeding tends to occur at the gastric wall near the previous site of EUS-FNA puncture (16, 21, 22). Solid pseudopapillary neoplasms account for 0.1% to 2.7% of all tumors of the pancreas (12) and are 10 times more frequent in young women than in men, with an average age of occurrence of 24 years (13). There have been no reports of needle tract seeding after EUS-FNA of pancreatic SPN thus far. In our institution, EUS-FNA is usually performed to confirm the pathological diagnosis and is typically limited to atypical cases with an inconclusive imaging diagnosis. Our rare case showed SPN of the pancreatic body that seeded in the gastric wall after EUS-FNA and grew over a course of 67 months, which is much longer than the 11-month average time until recurrence of other malignant tumors in the gastric wall following EUS-FNA (7, 9-11, 17, 19, 20, 23). This may reflect the slow growth and less-aggressive nature of SPN (14). An annual follow-up with endoscopy after EUS-FNA through the gastric wall should be considered to check for gastric wall tumor seeding.

The possibility of peritoneal dissemination and gastric wall seeding of tumor cells via the puncture route has been debated. Several retrospective cohort studies showed that

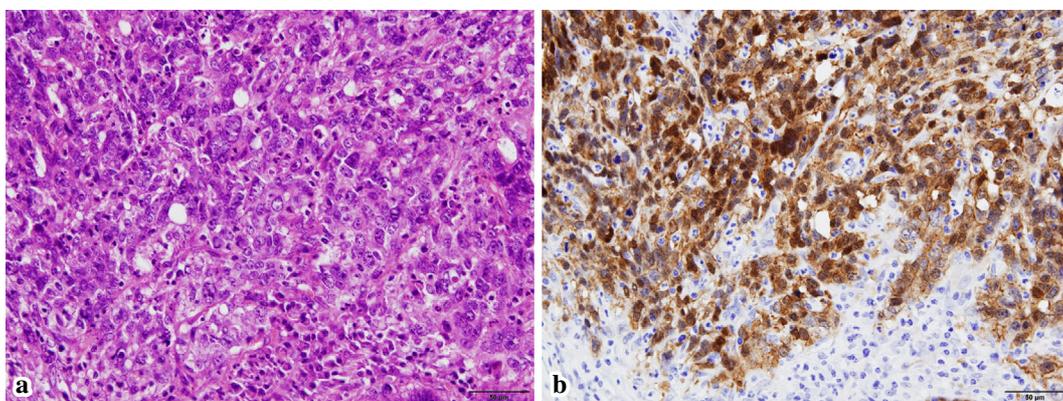


Figure 2. Hematoxylin and Eosin staining (a, $\times 400$) of the tumor of the body of the pancreas shows atypical tumor cells with solid growth that appear as distinct nuclear and cytoplasmic positive staining of beta-catenin on immunostaining (b, $\times 400$)

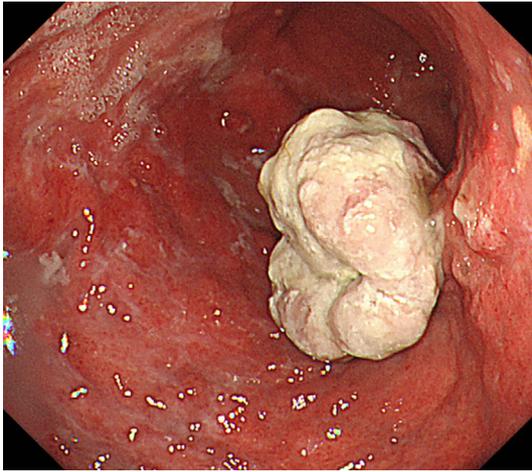


Figure 3. Upper gastrointestinal endoscopy reveals a protruding tumor in the posterior gastric wall.



Figure 4. Abdominal contrast-enhanced computed tomography reveals a hypervascular tumor 4 cm in diameter in the posterior gastric wall.

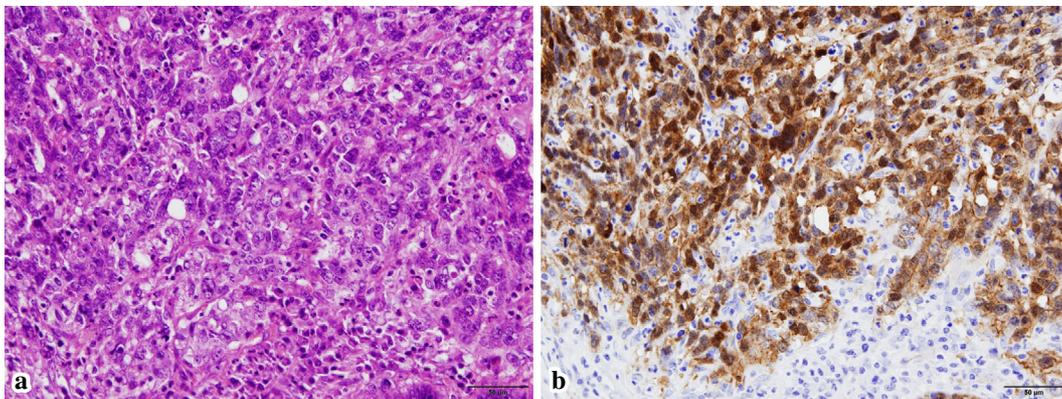


Figure 5. Hematoxylin and Eosin staining (a, $\times 400$) of the resected gastric tumor shows atypical tumor cells with a glandular and solid pattern. Tumor cells show distinct nuclear and cytoplasmic positive staining of beta-catenin on immunostaining (b, $\times 400$).

EUS-FNA was not associated with an increased risk of needle tract seeding (4, 8, 24). However, in previous reports (9, 18, 25) and our present case, the location of the tumor in the gastric wall matched closely with the puncture site, which supports the hypothesis of possible needle tract seeding following EUS-FNA. A larger prospective study to test this hypothesis is desirable.

Seeding of tumors after EUS-FNA occurred in the posterior gastric wall in our present case as well as all other reported cases (7, 9-11, 17, 19, 20, 23), which we attribute to puncturing being commonly performed at that site for EUS-FNA in order to achieve the shortest distance between the body and tail of the pancreas.

The differential diagnosis of gastric lesions on endoscopy and cross-sectional imaging is broad and includes a variety of epithelial and non-epithelial lesions. Based on the findings of our case, in patients who have previously undergone EUS-FNA for the evaluation of tumor of the pancreas, the differential diagnosis of gastric lesions should include seeding of the pancreatic tumor in the gastric wall after EUS-

FNA.

The authors state that they have no Conflict of Interest (COI).

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