

## 자연 가스조영 PET-CT에 의한 Vater 유두 상피내 암종의 진단: 1예 보고

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### Natural Gas Contrast PET-CT Diagnosis of Carcinoma in Situ of the Papilla of Vater: Report of a Case

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#### Introduction

Benign and malignant villous adenoma (papillary adenoma) of the ampulla or papilla of Vater is a rare tumor<sup>1)</sup> and carcinoma in situ in the papilla is much rarer still. Terminologically, carcinoma in situ is defined as an epithelial malignant tumor in which tumor cells are confined to the epithelium, not invading the basement membrane.<sup>2)</sup> This communication describes a case of carcinoma in situ of the papilla of Vater visually detected by natural gas-contrast <sup>18</sup>F-fluorodeoxyglucose (FDG) PET-CT, confirmed by duodenoscopy and pathology, and treated by extended pancreatic operation.

#### Case Report

A 55-year-old male patient, hospitalized in SungAe for one month to treat cerebral infarct and unresponsive diabetes mellitus, was referred to PET-CT center because of nausea, abdominal pain, and positive stool occult blood test. Other positive laboratory data were high fasting blood glucose level (275 mg/dl) and increased blood urea nitrogen (34.8 mg/dl) and creatinine level (1.4 mg/dl).

PET-CT performed on 2008.01.29 detected moderately enlarged, protruded papilla of Vater. The lesion was not shown on the initial PET-CT (Fig. 1) but clearly portrayed on the 1-h delayed PET-CT by gas contrast effect of swallowed air trapped in the periampullary region (Fig. 2A). SUV was initially 2.7max and later 2.6max. In the center of the enlarged papilla was an ill-defined area of low FDG uptake (SUV = initial 1.8max and later 1.6max) which was presented as a low density area on CT (Fig. 1B), corresponding to tumor erosion on duodenoscopy (Fig. 1C). The erosion was oozing, fragile, and easily bled to touch. Microscopic study of the biopsy specimen showed moderately differentiated adenocarcinoma confined to the epithelium (Fig. 3) and the final diagnosis of resected tumor measuring 1.2×1.0×1.0 cm was well differentiated adenocarcinoma without invasion of lympho-vascular or perineural tissues. The tumor was surgically removed in other hospital and the patient was found by a telephone interview to be free of tumor disease one year postoperatively.

#### Discussion

A systematic use of <sup>18</sup>F-FDG PET-CT in the diagnosis of periampullary neoplasms (PN) seems to have started since the early 2000s when Kalady et al.<sup>3)</sup> reported the results of their <sup>18</sup>F-FDG PET-CT study on PN, concluding that PET was highly sensitive and specific. Based on the analysis of 231 cases of pancreatic lesion Higashi et al.<sup>4)</sup> has confirmed the usefulness of <sup>18</sup>F-FDG

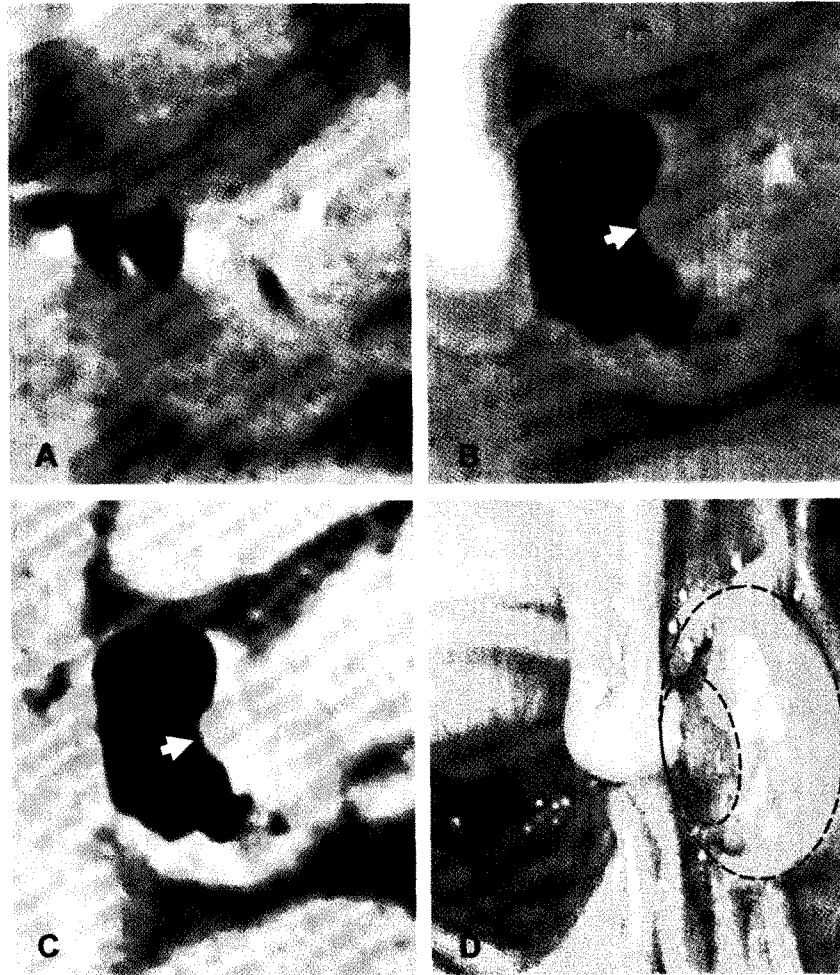
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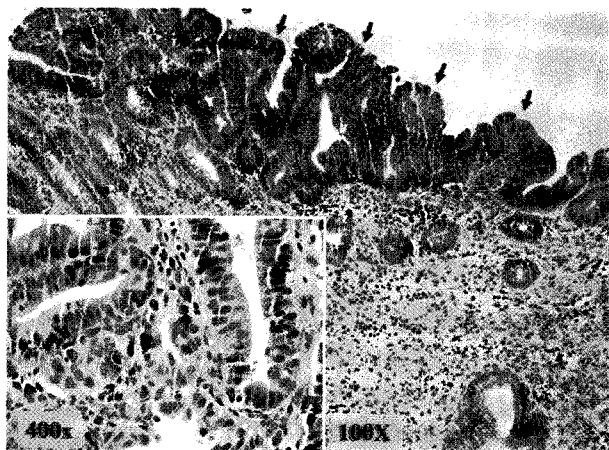


**Figure 1.** Close up of initial torso PET-CT (A) of periampullary region shows no detail of local anatomy. Close up of delayed one-bed PET-CT (B) clearly shows enlarged papilla without significant F18-FDG uptake (arrow). Note effect of gas distension, clearly bringing the profile of enlarged papilla into relief. CT scan (C) shows enlarged papilla with central low density area which corresponds to erosion in papillary tumor as confirmed by using duodenoscopy. Side view of duodenoscopy (D) shows enlarged papilla (large dotted circle) with central erosion (small dotted circle). Lesion was oozing, fragile, and easily bled to touch. Note that enlarged papilla is brought into relief by natural swallowed gas incidentally trapped in periampullary region of descending duodenum in Figs. B and C. Similar gas purposefully introduced to distend duodenum via duodenoscope is present in periampullary region in Fig. D.

PET-CT and more recently the feasibility to distinguish benign from malignant nonpancreatic PN was emphasized.<sup>5)</sup> Thus, the usefulness of <sup>18</sup>F-FDG PET-CT diagnosis of carcinomas in the papilla or ampulla of Vater has been well established. Terminologically, the [major] papilla of Vater and the ampulla of Vater are not exactly the same. Actually, the former is the intraluminally protruding portion of the ampulla whereas the ampulla is the intramural dilated portion of the distal end of the common bile duct. Both are named as nonpancreatic

periampullary portion.

Carcinoma in situ (CIS) in the periampullary region has received little attention presumably due to three facts. The first fact is that CIS is limited to the epithelial layer of the papilla of Vater, easily evading PET-CT detection, the second is its rareness in the periampullary region, and the third is that the major papilla of Vater, both normal and pathological, is difficult to identify on CT without help of contrast medium such as gas, barium suspension, or iodine compound solution. Fortunately, in our case gas



**Figure 2.** Photomicrograph shows moderately differentiated adenocarcinoma of papilla of Vater localized to epithelium (arrows). HE stain (100X). Inset is high power view (400X).

was occasioned to be in the periamplullary region so that it helped bring the enlarged papilla into relief (Fig. 1B).

This interesting experience has led us to encourage the use of gas or double contrast technique to enhance PET-CT detection of PN. In addition the reduction of the number of bed of PET scan is urged so that motion blur

due to respiration can be kept at the minimum. Indeed, the image quality in terms of resolution of the multi-bed ordinary torso PET-CT and single bed PET-CT differs considerably (Fig. 1A and B).

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