

# Peroral cholangioscopy for non-invasive papillary cholangiocarcinoma with extensive superficial ductal spread

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Received: 2005-01-06 Accepted: 2005-01-26

## INTRODUCTION

Papillary carcinoma arising from the extrahepatic bile duct often shows superficial ductal spread<sup>[1]</sup>. Peroral cholangioscopy, introduced in the 1970s by Rosch *et al*<sup>[2]</sup> and Nakajima *et al*<sup>[3]</sup>, provides direct visualization of the biliary ducts. We report herein the case of a patient with extensive superficial ductal spread of non-invasive papillary cholangiocarcinoma, which was depicted with peroral cholangioscopy.

## Abstract

Papillary carcinoma arising from the extrahepatic bile duct often shows superficial ductal spread. We report herein the case of a patient with extensive superficial spread of non-invasive papillary cholangiocarcinoma, which was depicted with peroral cholangioscopy. A 65-year-old woman presented with the sudden-onset of severe epigastric pain. Ultrasonography revealed acute acalculous cholecystitis. Endoscopic retrograde cholangiography found small protruding lesions around the confluence of the cystic duct, suggestive of a cholangiocarcinoma. As the contour of the middle and upper bile ducts it was slightly irregular on the cholangiogram, the presence of superficial ductal spread was suspected. Peroral cholangioscopy revealed small papillary lesions around the confluence of the cystic duct and fine granular mucosal lesions in the middle and upper bile ducts and the right hepatic duct, suggesting a superficially spreading tumor. A right hepatectomy with bile duct resection was performed and no residual tumor was found. Histological examination revealed a non-invasive papillary carcinoma arising from the cystic duct with extensive superficial spread. Our experience of this case and a review of the literature suggest that a fine granular or fine papillary appearance of the ductal mucosae on cholangioscopy indicates superficial spread of papillary cholangiocarcinoma, for which peroral cholangioscopy is an efficient diagnostic option.

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**Key words:** Cholangiocarcinoma; Bile duct neoplasms; Peroral cholangioscopy; Papillary carcinoma; Superficial ductal spread; Surgery

Wakai T, Shirai Y, Hatakeyama K. Peroral cholangioscopy for non-invasive papillary cholangiocarcinoma with extensive superficial ductal spread. *World J Gastroenterol* 2005; 11(41): 6554-6556  
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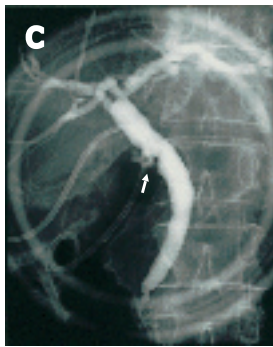
## CASE REPORT

A 65-year-old woman presented with the sudden-onset of severe epigastric pain. No jaundice was observed on physical examination, and the serum total bilirubin level was 0.6 mg/dL (reference range: 0.3-0.9 mg/dL). The serum levels of carcinoembryonic antigen and carbohydrate antigen 19-9 were 0.7 ng/mL (reference range: 0-6 ng/mL) and 6 U/mL (reference range: 0-37 U/mL), respectively.

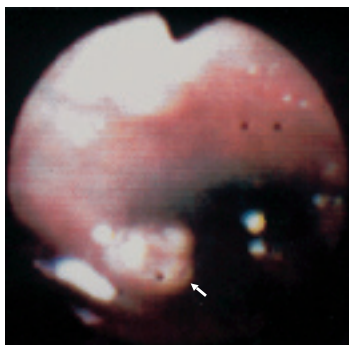
Ultrasonography revealed acute acalculous cholecystitis, for which percutaneous cholecystostomy was performed. Endoscopic retrograde cholangiography found small protruding lesions around the confluence of the cystic duct, suggestive of a cholangiocarcinoma (Figure 1). Smear cytology of the ductal bile aspirated during endoscopic retrograde cholangiography revealed that exfoliated cells were categorized into Papanicolaou class II. As the contour of the middle and upper bile ducts was slightly irregular on the cholangiogram, the presence of superficial ductal spread was suspected. In order to confirm this, peroral cholangioscopy using a fiberoptic endoscope (CHF-B20QY, Olympus, Tokyo, Japan) was performed, and both small papillary lesions around the confluence of the cystic duct (Figure 2) and fine granular mucosal lesions, brownish in color, in the middle and upper bile ducts were revealed, suggesting a superficially spreading tumor. Such mucosal lesions were also seen in the right hepatic duct (Figure 3).

After laparotomy, a bile duct resection with regional lymphadenectomy was performed. As the resection margin at the right hepatic duct was positive for *in situ* carcinoma on frozen-section examination, a right hepatectomy was additionally performed and no residual tumor was found. Histological examination of the resected specimen revealed a non-invasive papillary carcinoma arising from the cystic duct, with superficial spread extending up to the right anterior sectoral duct (pathologic T1N0M0, Stage IA, according to the tumor-node-metastasis staging system<sup>[4]</sup>).

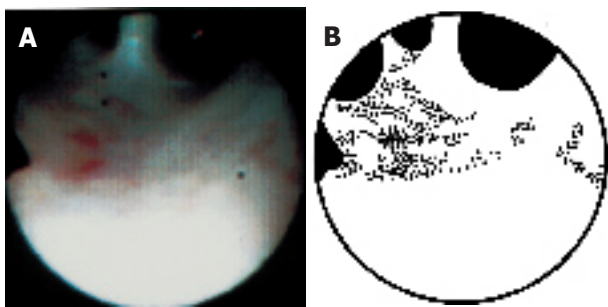
Fine granular mucosal lesions on peroral cholangioscopy (Figure 3) corresponded to papillary *in situ* carcinoma histologically, whereas the flat mucosae between the fine granular mucosal lesions, which appeared normal on cholangioscopy (Figure 3), corresponded to non-papillary *in situ* carcinoma. The patient remains healthy, with no evidence of recurrence 7 years after the resection.



**Figure 1** Endoscopic retrograde cholangiography. The cystic duct is poorly opacified with small protruding lesions around the confluence of the cystic duct (arrow). An 8-Fr pig-tail catheter (C) is inserted into the gallbladder.



**Figure 2** Peroral cholangioscopy shows a small papillary lesion (arrow) around the confluence of the cystic duct.



**Figure 3** Peroral cholangioscopy of the interior of the right hepatic duct. **A:** Fine granular mucosal lesions, brownish in color, are scattered, suggesting the presence of papillary *in situ* carcinoma. The flat mucosae between the fine granular lesions, which appear normal on cholangioscopy, corresponded to non-papillary *in situ* carcinoma histologically. The lower part of this figure is fogged owing to halation. **B:** Schematic representation. The dotted areas indicate the fine granular lesions.

## DISCUSSION

Nimura and Kamiya<sup>[5,6]</sup> demonstrated, by means of percutaneous transhepatic cholangioscopy, that a fine granular or fine papillary appearance of the ductal mucosae indicates superficial spread of cholangiocarcinoma. In the current case, the fine granular mucosal appearance on cholangioscopy corresponded to papillary *in situ* carcinoma histologically. It is very likely that a fine granular or fine papillary mucosal appearance on cholangioscopy is pathognomonic of superficial ductal spread of papillary cholangiocarcinoma.

The ductal resection margin status is an established prognostic factor in patients with extrahepatic cholangiocarcinoma<sup>[7,8]</sup>. Although intraductal ultrasonography is helpful in discerning T category of biliary malignancies<sup>[9]</sup>, the extent of the superficial spread of cholangiocarcinoma is difficult to determine preoperatively on imaging studies<sup>[5,10,11]</sup>. In the current case, although peroral cholangioscopy detected papillary *in situ* carcinoma in the form of fine granular lesions, it did not detect the non-papillary *in situ* carcinoma between the lesions, suggesting that cholangioscopy is incapable of detecting flat ductal spread of *in situ* carcinoma. Intraoperative frozen-section examination is indispensable in assessing the ductal resection margin status.

In conclusion, a fine granular or fine papillary appearance of the ductal mucosae on cholangioscopy suggests superficial spread of papillary cholangiocarcinoma, for which peroral cholangioscopy is an efficient diagnostic option, unless the superficial lesions are flat.

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**Science Editor** Wang XL and Guo SY **Language Editor** Elsevier HK