

This article is licensed under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC) (<http://www.karger.com/Services/OpenAccessLicense>). Usage and distribution for commercial purposes requires written permission.

# Duodenal Adenocarcinoma Diagnosed from a Biopsy Specimen of a Depressed Lesion Obtained by Magnifying Endoscopy

Minoru Tomizawa<sup>a</sup> Fuminobu Shinozaki<sup>b</sup> Yasufumi Motoyoshi<sup>c</sup>  
Takao Sugiyama<sup>d</sup> Shigenori Yamamoto<sup>e</sup> Naoki Ishige<sup>f</sup>

<sup>a</sup>Department of Gastroenterology, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan; <sup>b</sup>Department of Radiology, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan; <sup>c</sup>Department of Neurology, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan; <sup>d</sup>Department of Rheumatology, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan; <sup>e</sup>Department of Pediatrics, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan; <sup>f</sup>Department of Neurosurgery, National Hospital Organization Shimoshizu Hospital, Yotsukaido, Japan

## Keywords

Duodenal adenoma · Duodenal adenocarcinoma · Endoscopic ultrasonography · Mini-probe · Narrow-band imaging · Magnetic resonance cholangiopancreatography

## Abstract

Biopsies are necessary for the management of duodenal tumors. However, the most suitable targets for biopsy are not known. An 82-year-old woman who regularly visited our hospital for rheumatoid arthritis underwent abdominal ultrasonography. This screening revealed a dilated pancreatic duct. Magnetic resonance cholangiopancreatography was performed, and dilatation of the pancreatic duct was confirmed. The patient underwent duodenoscopy to investigate the possibility of obstruction of the papilla of Vater. The examination revealed an elevated lesion around the papilla of Vater. Endoscopic ultrasonography and a 20-MHz mini-probe were used to investigate the depth of the invasion. The common bile and pancreatic ducts were intact. The mucosal and submucosal borders were indistinct; however, the border between the submucosa and muscularis propria was clear, suggesting that the muscularis

propria was intact. Magnifying endoscopy was used to examine the surface of the elevated lesion, which revealed a depressed lesion. A biopsy specimen of the depressed lesion was taken, and the tumor was diagnosed as an adenocarcinoma. Another biopsy specimen from a non-depressed lesion was diagnosed as an adenoma. The patient was diagnosed with duodenal adenocarcinoma, and was recommended surgery. She declined surgery and was followed up for 34 months. Because it is possible for depressed lesions of duodenal tumors to be adenocarcinomas, biopsy specimens should be obtained from depressed lesions of duodenal tumors.

© 2016 The Author(s)  
Published by S. Karger AG, Basel

## Introduction

Duodenal tumors are extremely rare, with only 0.1% prevalence according to upper gastrointestinal endoscopy screenings [1, 2]. Duodenal tumors may be adenomas or adenocarcinomas; however, most are adenomas in the descending portion [3]. Patients with ampullary tumors typically present with jaundice or pancreatitis due to obstruction of the common bile duct, sometimes even in the early stages. Non-ampullary tumors are hard to diagnose because they are typically non-symptomatic. They may present as an obstruction of the duodenum or bleeding at advanced stages. Adenomas generally require endoscopic treatment or close follow-up [4]. However, adenocarcinomas typically require surgical treatment [5]. The management also differs between adenomas and adenocarcinomas. Therefore, an accurate diagnosis is necessary for the appropriate management of duodenal tumors [6].

The differentiation between adenomas and adenocarcinomas remains difficult [7]. Biopsy with endoscopy is a good method for pathological diagnosis. However, the diagnostic accuracy is limited [8]. For instance, T1a adenocarcinomas are present in 13.5% of adenomas [9]. It is, therefore, important to obtain biopsy specimens from portions of adenocarcinoma to ensure their accurate diagnosis.

We diagnosed a case of duodenal adenocarcinoma with a biopsy specimen obtained from a depressed lesion on the duodenal tumor. The findings of our case suggest that depressed lesions may be suitable targets for biopsy.

## Case Presentation

An 82-year-old woman regularly visited National Hospital Organization Shimoshizu Hospital for rheumatoid arthritis. She underwent abdominal ultrasonography screening (SSA-700A; Toshiba Medical Systems, Otawara, Japan) with a 3.75-MHz curved-array probe (PVT-375BT; Toshiba Medical Systems). This examination revealed a dilated pancreatic duct (fig. 1a). To investigate the possibility that the pancreatic duct was stenotic or obstructed, she underwent magnetic resonance cholangiopancreatography (Achieva, software version 3.2.2.; Philips Medical Systems, Best, The Netherlands). This imaging indicated that the dilated pancreatic duct was not stenotic or obstructed (fig. 1b). A duodenoscopy (JF-260V; Olympus, Tokyo, Japan) revealed an elevated lesion around the papilla of Vater (fig. 1c). Upper gastrointestinal series showed that the lesion had an irregular surface and was located in the descending portion of the duodenum (fig. 1d). These findings suggested the presence of a duodenal tumor around the papilla of Vater.

Endoscopic ultrasonography (GF-UCT260; Olympus) was performed to investigate the depth of the tumor invasion of the common bile and pancreatic ducts. Both ducts were intact

(fig. 2a). A 20-MHz mini-probe (UM-3R-3; Olympus) was used to examine the depth of invasion of the wall of the duodenum. The border between the mucosa and submucosa was not clear; however, the border between the submucosa and muscularis propria was clear (fig. 2b). This finding suggested that the tumor was restricted to the mucosa and submucosa, and that the muscularis propria was intact.

A magnifying endoscopy was used to examine the surface of the tumor (GIF-H260Z; Olympus). The surface pattern was regular. A depressed lesion was observed with white light (fig. 3a) and narrow-band imaging (fig. 3b). A biopsy specimen obtained from the depressed lesion (fig. 3c) revealed an adenocarcinoma (fig. 3d). Another biopsy specimen obtained from a non-depressed portion of the elevated lesion (fig. 3e) revealed an adenoma (fig. 3f).

The patient was informed about the duodenal adenocarcinoma diagnosis, and surgery was recommended. However, she refused surgery. She visited our hospital regularly, and was followed up for 34 months. No additional symptoms developed, such as jaundice, bleeding, or obstruction of the duodenum.

## Discussion

Biopsies are the most important tools for the diagnosis of adenoma and adenocarcinoma [10]. It is, however, difficult to target a particular portion of the adenocarcinoma with upper gastrointestinal endoscopy. Random biopsy of duodenal tumors is not practical for the efficient differentiation of adenomas and adenocarcinomas [11]. Magnifying endoscopy narrow-band imaging has been proposed as a method to investigate duodenal tumors to diagnose adenomas or adenocarcinomas [12, 13]. Uchiyama et al. [7] reported that pinecone/leaf-shaped villi or irregular/non-structured duodenal tumor surfaces strongly correlate with adenomas or adenocarcinomas. Kikuchi et al. [14] classified tumor surfaces as monotype or mixed-type on the basis of the presence of a single pattern. However, despite these efforts, it remains difficult to differentiate adenomas from adenocarcinomas by observation with upper gastrointestinal endoscopies. It is also difficult to target a portion of adenocarcinoma for biopsy.

In our patient, a biopsy specimen from the depressed lesion on the tumor surface was diagnosed as an adenocarcinoma. However, a biopsy specimen from a non-depressed lesion was diagnosed as an adenoma. These results suggest that depressed lesions in duodenal tumors may be adenocarcinomas. Kakushima et al. [15] retrospectively analyzed 84 superficial duodenal tumors. They reported that duodenal tumors with depressed lesions were significantly correlated with adenocarcinomas. However, they did not analyze the diagnoses of biopsy specimens obtained from depressed lesions of duodenal tumors. To our knowledge, no reports have compared the diagnoses of biopsy specimens from depressed and non-depressed lesions. In our case, the depressed lesion was very clearly an adenocarcinoma. Our case also suggests that depressed lesions should be targeted for a biopsy for the diagnosis of adenocarcinomas.

Based on the findings of this report, biopsy specimens should be obtained from depressed lesions on elevated lesions in the duodenum. Magnifying endoscopy may be useful to determine the biopsy target.

### Statement of Ethics

This report was approved by the Ethics Committee of the National Hospital Organization Shimoshizu Hospital. It was considered a part of daily clinical practice rather than a clinical trial. Written informed consent for this report was obtained from the patient. The patient's records were anonymously and retrospectively analyzed. Written informed consent was obtained for magnetic resonance cholangiopancreatography, upper gastrointestinal endoscopy with duodenoscopy and magnifying endoscopy, endoscopic ultrasonography, and mini-probe.

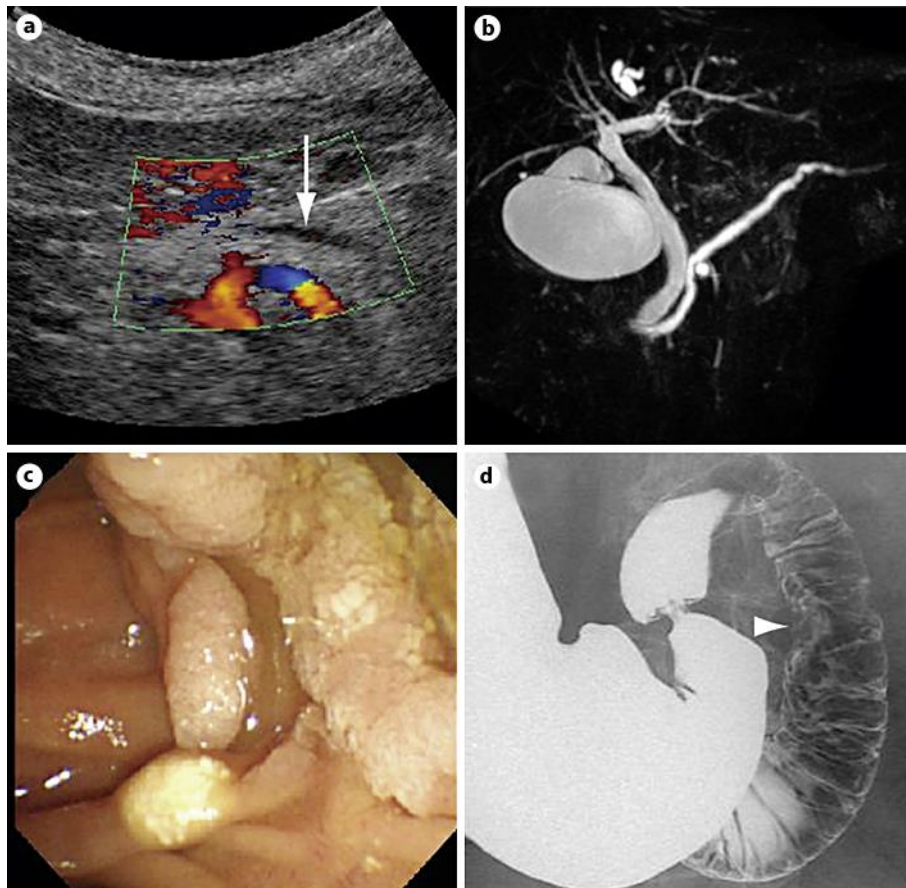
### Disclosure Statement

There are no conflicts of interest to declare.

### References

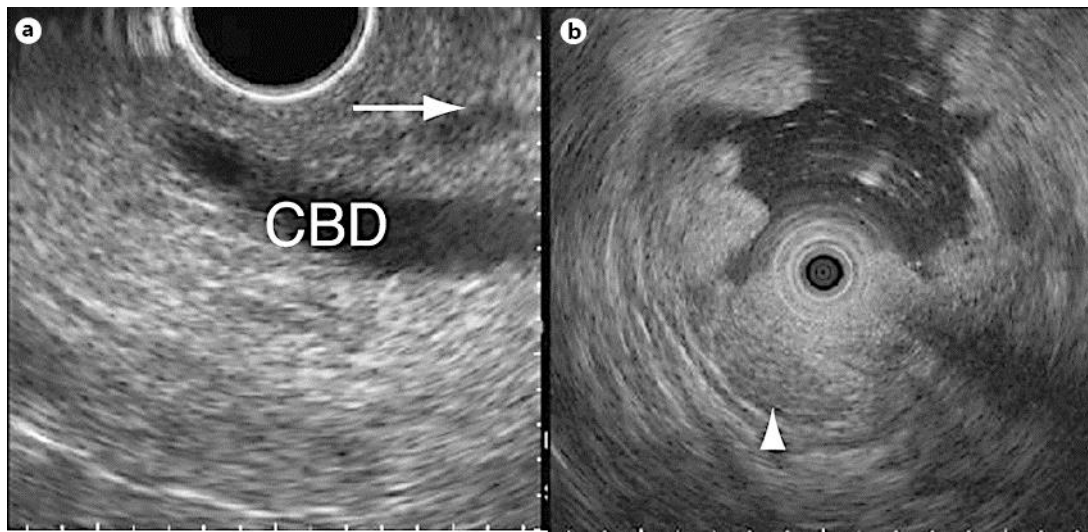
- Jepsen JM, Persson M, Jakobsen NO, Christiansen T, Skoubo-Kristensen E, Funch-Jensen P, Kruse A, Thommesen P: Prospective study of prevalence and endoscopic and histopathologic characteristics of duodenal polyps in patients submitted to upper endoscopy. *Scand J Gastroenterol* 1994;29:483–487.
- Ushiku T, Arnason T, Fukayama M, Lauwers GY: Extra-ampullary duodenal adenocarcinoma. *Am J Surg Pathol* 2014;38:1484–1493.
- Bourke MJ: Endoscopic resection in the duodenum: Current limitations and future directions. *Endoscopy* 2013;45:127–132.
- Nonaka S, Oda I, Tada K, Mori G, Sato Y, Abe S, Suzuki H, Yoshinaga S, Nakajima T, Matsuda T, Taniguchi H, Saito Y, Maetani I: Clinical outcome of endoscopic resection for nonampullary duodenal tumors. *Endoscopy* 2015;47:129–135.
- Bourgouin S, Ewald J, Mancini J, Moutardier V, Delpero JR, Le Treut YP: Predictors of survival in ampullary, bile duct and duodenal cancers following pancreaticoduodenectomy: a 10-year multicentre analysis. *J Gastrointest Surg* 2015;19:1247–1255.
- Kakushima N, Kanemoto H, Tanaka M, Takizawa K, Ono H: Treatment for superficial non-ampullary duodenal epithelial tumors. *World J Gastroenterol* 2014;20:12501–12508.
- Uchiyama Y, Imazu H, Kakutani H, Hino S, Sumiyama K, Kuramochi A, Tsukinaga S, Matsunaga K, Nakayoshi T, Goda K, Saito S, Kaise M, Kawamura M, Omar S, Tajiri H: New approach to diagnosing ampullary tumors by magnifying endoscopy combined with a narrow-band imaging system. *J Gastroenterol* 2006;41:483–490.
- Yamaguchi K, Enjoji M, Kitamura K: Endoscopic biopsy has limited accuracy in diagnosis of ampullary tumors. *Gastrointest Endosc* 1990;36:588–592.
- Lepilliez V, Chemaly M, Ponchon T, Napoleon B, Saurin JC: Endoscopic resection of sporadic duodenal adenomas: an efficient technique with a substantial risk of delayed bleeding. *Endoscopy* 2008;40:806–810.
- Goda K, Kikuchi D, Yamamoto Y, Takimoto K, Kakushima N, Morita Y, Doyama H, Gotoda T, Maehata Y, Abe N: Endoscopic diagnosis of superficial non-ampullary duodenal epithelial tumors in Japan: multicenter case series. *Dig Endosc* 2014;26(suppl 2):23–29.
- Pittayanon R, Imraporn B, Rerknimitr R, Kullavanijaya P: Advances in diagnostic endoscopy for duodenal, including ampullary, adenoma. *Dig Endosc* 2014;26(suppl 2):10–15.
- Yoshimura N, Goda K, Tajiri H, Ikegami M, Nakayoshi T, Kaise M: Endoscopic features of nonampullary duodenal tumors with narrow-band imaging. *Hepatogastroenterology* 2010;57:462–467.
- Tsuji S, Doyama H, Tsuji K, Tsuyama S, Tominaga K, Yoshida N, Takemura K, Yamada S, Niwa H, Katayanagi K, Kurumaya H, Okada T: Preoperative endoscopic diagnosis of superficial non-ampullary duodenal epithelial tumors, including magnifying endoscopy. *World J Gastroenterol* 2015;21:11832–11841.
- Kikuchi D, Hoteya S, Iizuka T, Kimura R, Kaise M: Diagnostic algorithm of magnifying endoscopy with narrow band imaging for superficial non-ampullary duodenal epithelial tumors. *Dig Endosc* 2014;26(suppl 2):16–22.

- 15 Kakushima N, Kanemoto H, Sasaki K, Kawata N, Tanaka M, Takizawa K, Imai K, Hotta K, Matsubayashi H, Ono H: Endoscopic and biopsy diagnoses of superficial, nonampullary, duodenal adenocarcinomas. *World J Gastroenterol* 2015;21:5560–5567.

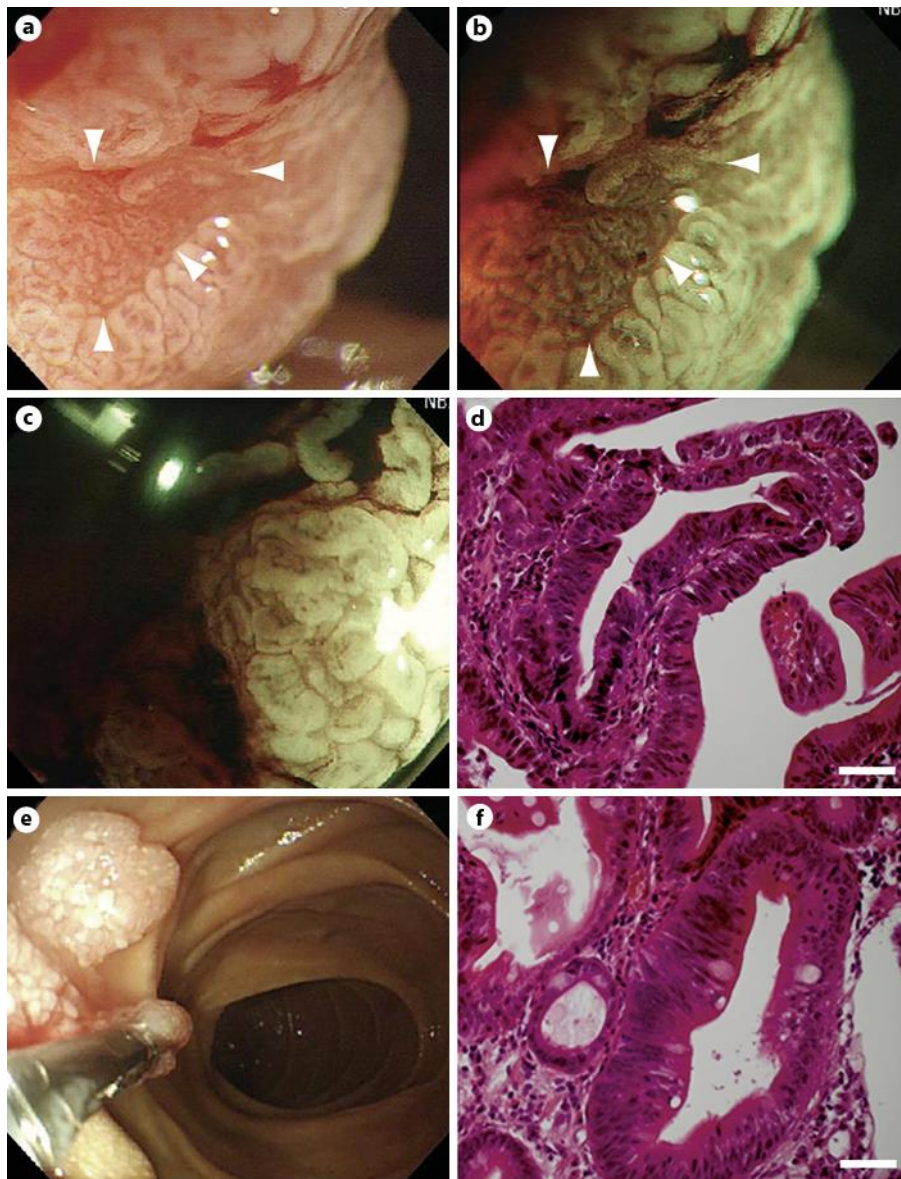


**Fig. 1.** An elevated lesion in the descending portion of the duodenum. Abdominal ultrasonography (**a**, arrow) and magnetic resonance cholangiopancreatography (**b**) show dilatation of the pancreatic duct. **c** Duodenoscopy shows an elevated lesion with a villous surface. **d** Upper gastrointestinal series shows an elevated lesion in the descending portion of the duodenum (arrowhead).





**Fig. 2.** Examination of the elevated lesion with endoscopic ultrasonography and mini-probe. **a** Endoscopic ultrasonography shows intact common bile and pancreatic ducts (arrow). CBD = Common bile duct. **b** A 20-MHz mini-probe indicates that the elevated lesion is limited to the mucosa and submucosa. The muscularis propria is intact (arrowhead).



**Fig. 3.** Biopsy of the elevated lesion with magnifying endoscopy. Magnifying endoscopy with white light (**a**) and narrow-band imaging (**b**) shows a depressed lesion on the surface of the elevated lesion. A clear demarcation line is visible (arrowheads). A biopsy specimen from the depressed lesion (**c**) was diagnosed as an adenocarcinoma. Another biopsy specimen obtained from the elevated lesion (**e**) was diagnosed as an adenoma (**f**). Original magnification:  $\times 400$ . Scale bars = 50  $\mu\text{m}$ .