Clinical Journal of Gastroenterology (2019) 12:189–192
https://doi.org/10.1007/s12328-018-0911-z

CASE REPORT

Superficial non-ampullary duodenal cancer identified by small-bowel capsule endoscopy: a case report (with video)

Kazuhiro Ota[1] · Satoshi Kikutani[1,2] · Yuka Kawasaki[1,2] · Noriaki Sugawara[1] · Satoshi Harada[1] · Yuichi Kojima[1] · Sadaharu Nouda[1] · Toshihisa Takeuchi[1] · Hiroshi Akutagawa[3] · Kazuhide Higuchi[1]

Received: 13 July 2018 / Accepted: 18 September 2018 / Published online: 26 September 2018

Abstract

Herein, we report for the first time a case of a surficial superficial non-ampullary duodenal cancer causing obscure intestinal bleeding that was identified by small-bowel capsule endoscopy and treated by endoscopic mucosal resection. A 73-year-old man underwent upper gastrointestinal endoscopy to identify the cause of anemia. Although conventional duodenoscopy revealed a flat, elevated 5-mm lesion with a central recess and "milk-white mucosa" at the inferior duodenal angulus, capsule endoscopy revealed a white nodular 5-mm lesion with central recess at the duodenum slightly to the anal side from the major duodenal papilla. Pathohistological examination revealed a low-grade well-differentiated tubular adenocarcinoma growing locally in the mucosal layer. Although capsule endoscopy detected a nodular lesion, conventional endoscopy revealed a flat, elevated lesion. The cause of this difference in endoscopic findings is considered to be the degree of extension of the intestinal mucosa. In contrast, "milk-white mucosa" as a typical finding of superficial duodenal tumor in conventional endoscopy could be identified as a white mucosal color tone in capsule endoscopy. Conventional endoscopic findings of irregular surface structure in the lesion suggested malignancy. Pathohistologically, the ductal structure of the adenocarcinoma was also distorted. Unfortunately, it was difficult to suggest that the lesion was adenocarcinoma based on the endoscopic findings alone.

Keywords Adenocarcinoma · Capsule endoscopy · Duodenal cancer

Introduction

Small-bowel adenocarcinoma is remarkably rare, with incidence of 6.8 cases per million [1], and 47–58% of small-bowel adenocarcinomas have developed in the duodenum [2–5]. Moreover, superficial non-ampullary duodenal tumor is even rarer than advanced tumor. Since superficial non-ampullary duodenal tumors are generally less symptomatic, they are difficult to detect in the early stage. Development in endoscopic technology might be increasing the identification of superficial duodenal adenocarcinoma. In fact, Goda et al. [6] reported that the number of resected superficial non-ampullary duodenal tumor is dramatically increasing in Japan. The typical endoscopic findings of surficial duodenal tumor including adenoma and adenocarcinoma are as follows: (1) located in the second part of the duodenum in most cases, (2) whitish color tone as "milk-white mucosa" or same color tone as the background, and (3) elevated structure [6, 7]. However, these endoscopic findings were described based on conventional duodenoscopy findings. A comparison of the capsule endoscopic findings, conventional duodenoscopic findings, and pathohistological findings has not been reported. Herein, we described a case of superficial non-ampullary duodenal cancer that was identified by small-bowel capsule endoscopy and treated by endoscopic mucosal resection.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12328-018-0911-z) contains supplementary material, which is available to authorized users.

✉ Kazuhiro Ota
clash_kaz@yahoo.co.jp

[1] Second Department of Internal Medicine, Osaka Medical College, Daigaku-Machi, Takatsuki, Osaka 569-8686, Japan

[2] Department of Gastroenterology, Katsuragi Hospital, Kishiwada, Japan

[3] Department of Pathology, Osaka Medical College, Takatsuki, Japan

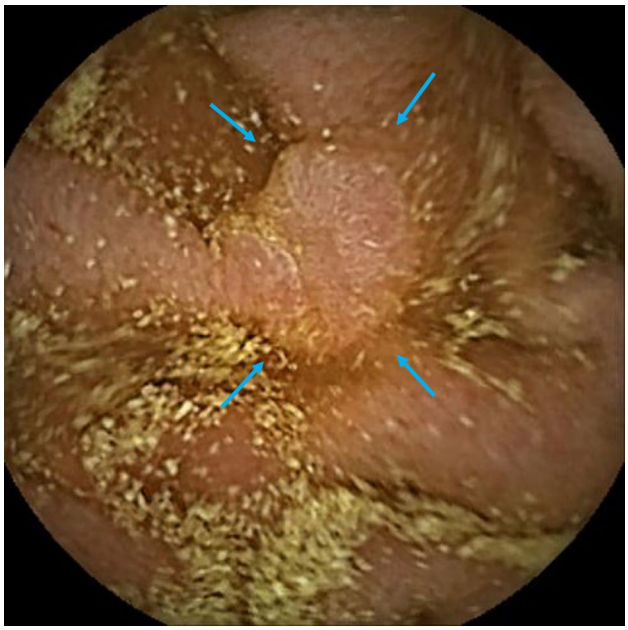

Fig. 1 Capsule endoscopy revealed a white nodular lesion of 5-mm central recess at the duodenum slightly to the anal side from the major duodenal papilla

Case report

A 73-year-old Japanese man presented to the Osaka Medical College Hospital with mild anemia (hemoglobin, 9.7 g/dL). He had no background risk factors of duodenal cancer, such as familial adenomatous polyposis, Peutz–Jeghers syndrome, Lynch syndrome, and inflammatory bowel diseases. Although he underwent conventional esophagogastroduodenoscopy and colonoscopy, the origin of the gastrointestinal bleeding had been uncertain. As an intestinal bleeding source was suspected in the small intestine, he underwent small-bowel capsule endoscopy (PillCam®SB3, Covidien, Dublin, Ireland). Capsule endoscopy revealed a white nodular 5-mm lesion with central recess at the duodenum slightly to the anal side from the major duodenal papilla (Fig. 1, Supplementary Video 1). Repeat duodenoscopy revealed a flat, elevated 5-mm lesion with a central recess, so-called type IIa + IIc, and "milk-white mucosa" at the inferior duodenal angulus (Fig. 2). Because the first esophagogastroduodenoscopy examined only until the second part of the duodenum, this lesion at the inferior duodenal angulus had been missed. Consequently, this lesion was diagnosed as surficial duodenal tumor, and an en bloc resection was performed by endoscopic mucosal resection technique. Pathohistological examination of the specimen revealed a well-differentiated

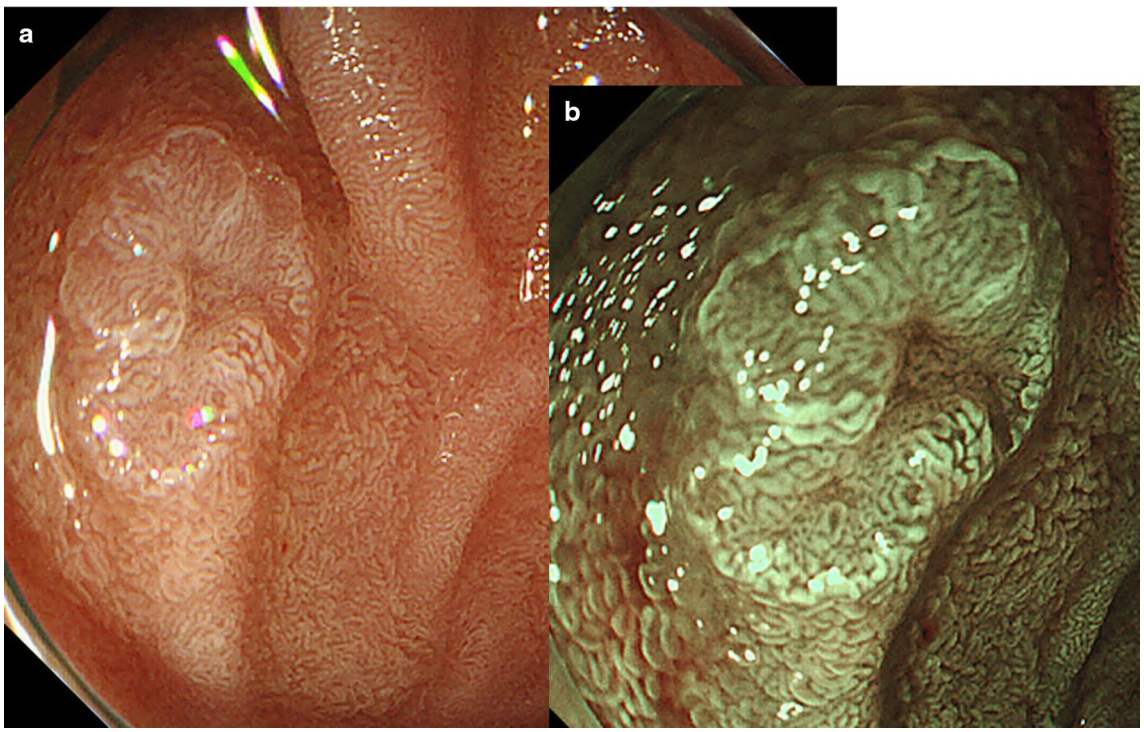

Fig. 2 Duodenoscopy revealed a flat, elevated 5-mm lesion with a center recess with "milk-white mucosa" at the inferior duodenal angulus. **a** Conventional white light imaging. **b** Narrow band imaging

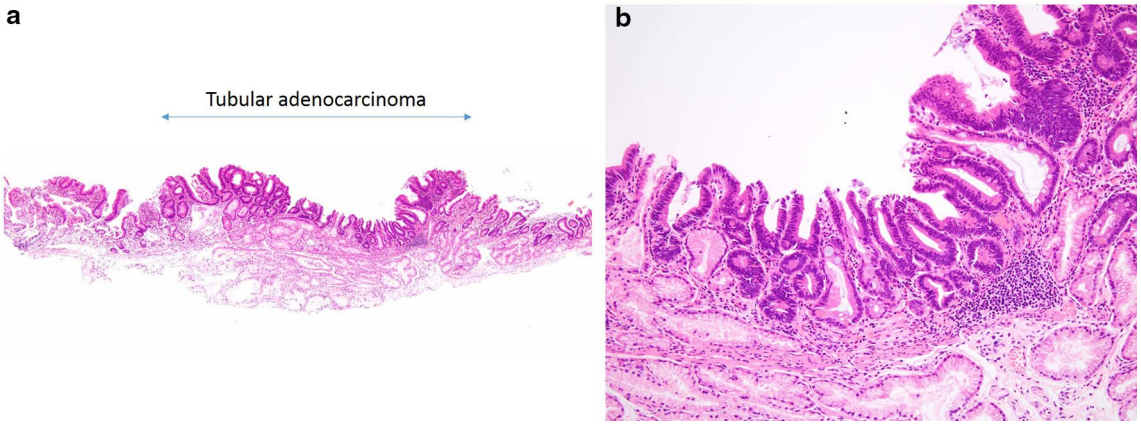

Fig. 3 Pathohistological examination of the specimen revealed a well-differentiated tubular adenocarcinoma growing locally in the mucosal layer (**b**). No cancer cells were found in the vertical and horizontal margins (**a**), and there was no invasion of cancer cells to the lymph ducts and blood vessels (**b**)

tubular adenocarcinoma growing locally in the mucosal layer. No cancer cells were found in the vertical and horizontal margins, and there was no invasion of cancer cells to lymph ducts and blood vessels (Fig. 3). We judged which superficial duodenal adenocarcinoma was cured by endoscopic resection based on these pathohistological findings.

Discussion

In this case, although the lesion was visualized as a nodular lesion in capsule endoscopy, it was depicted as a flat, elevated lesion in conventional endoscopy. The cause of this difference in endoscopic findings is the degree of extension of the intestinal mucosa. In contrast, "milk-white mucosa" as a typical finding of superficial duodenal tumor in conventional endoscopy could be identified as a white mucosal color tone in capsule endoscopy. It was reported previously that duodenal adenocarcinoma tends to have a stronger redness and weaker whiteness than duodenal adenoma [8]. However, the pathohistological finding of the endoscopic resected specimen of the present case was adenocarcinoma despite the presence of whitish mucosa in endoscopic findings. This was because the adenocarcinoma was well differentiated.

Conventional endoscopic findings of irregular surface structure in the lesion suggested malignancy, that is, adenocarcinoma. Pathohistologically, the ductal structure of the adenocarcinoma was also distorted. Unfortunately, in this case, it was difficult to suggest adenocarcinoma based on the capsule endoscopic findings alone. A clear relationship between capsule endoscopic findings and pathohistological findings might be elucidated by accumulating cases.

In the present case, whether this duodenal adenocarcinoma was the cause of anemia was unknown. There were no histological findings causing bleeding, such as ulceration, scar, or artery involvement in the specimen. This patient did not take any antiplatelet or anticoagulant. Accumulating cases is necessary to clarify the relationship between anemia and duodenal cancer.

Compliance with ethical standards

Conflict of interest Kazuhiro Ota, Satoshi Kikutani, Yuka Kawasaki, Noriaki Sugawara, Satoshi Harada, Yuichi Kojima, Sadaharu Nouda, Toshihisa Takeuchi, Hiroshi Akutagawa, and Kazuhide Higuchi declare that they have no conflict of interest.

Human/animal rights All procedures followed have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Informed consent Informed consent was obtained from all patients for being included in the study.

References

1. Schottenfeld D, Beebe-Dimmer JL, Vigneau FD. The epidemiology and pathogenesis of neoplasia in the small intestine. Ann Epidemiol. 2009;19:58–69.
2. North JH, Pack MS. Malignant tumors of the small intestine: a review of 144 cases. Am Surg. 2000;66:46–51.
3. Ito H, Perez A, Brooks DC, et al. Surgical treatment of small bowel cancer: A 20-year single institution experience. J Gastrointest Surg. 2003;7:925–30.
4. Dabaja BS, Suki D, Pro B, et al. Adenocarcinoma of the small bowel: Presentation, prognostic factors, and outcome of 217 patients. Cancer. 2004;101:518–26.
5. Howe JR, Karnell LH, Menck HR, et al. The American College of Surgeons Commission on Cancer and the American Cancer Society. Adenocarcinoma of the small bowel: review of the National Cancer Data Base, 1985–1995. Cancer. 1999;86:2693–706.

6. Goda K, Kikuchi D, Yamamoto Y, et al. Endoscopic diagnosis of superficial non-ampullary duodenal epithelial tumors in Japan: multicenter case series. Dig Endosc. 2014;26(Suppl. 2): 23–9.
7. Kinoshita S, Nishizawa T, Ochiai Y, et al. Accuracy of biopsy for the preoperative diagnosis of superficial nonampullary duodenal adenocarcinoma. Gastrointest Endosc. 2017;86:329–32.
8. Kakushima N, Kanemoto H, Sasaki K, et al. Endoscopic and biopsy diagnoses of superficial, nonampullary, duodenal adenocarcinomas. World J Gastroenterol. 2015;21:5560–7.