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Surgical Resection of a Duodenal Serrated Adenoma

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Abbreviations:

EGD: Esophagogastroduodenoscopy**;** EUS-FNA: Endoscopic Ultrasound-Guided Fine-Needle Aspiration**;** TSA: Traditional Serrated Adenoma**;** CT: Computed Tomography

1. Abstract

1.1. Introduction

Duodenal serrated adenomas are rare precancerous lesions that may progress to invasive adenocarcinomas. Owing to their rarity, preoperative diagnosis of these lesions remains challenging.

1.2. Case Presentation

A 74-year-old male patient presented with duodenal stenosis identified during esophagogastroduodenoscopy (EGD). Initial biopsies were inconclusive, and endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) did not confirm malignancy. Subsequently, the patient developed severe pancreatitis as a complication of EUS-FNA. Serial biopsies performed over 5 months ultimately revealed serrated glandular structures with cytological atypia, confirming the diagnosis of duodenal serrated adenoma. The patient underwent a subtotal stomach-preserving pancreaticoduodenectomy combined with a right hemicolectomy. Histopathological examination confirmed a traditional serrated adenoma with malignant transformation.

1.3. Conclusions

Given the high malignant potential of duodenal serrated adenomas, early detection and timely surgical resection are essential. Repeated tissue biopsies and meticulous endoscopic evaluations play vital roles in enhancing diagnostic accuracy and informing appropriate treatment strategies.

2. Introduction

In recent years, in addition to the well-established adenoma-carcinoma sequence, the malignant potential of serrated lesions has been increasingly acknowledged, especially in colorectal cancer. A traditional serrated adenoma (TSA) is a representative lesion that warrants active removal when identified in the lower gastrointestinal tract. However, reports of serrated adenomas occurring in the upper gastrointestinal tract remain scarce. Herein, we present a case of duodenal serrated adenoma that posed a significant diagnostic challenge.

3. Case Presentation

3.1. Patient Information

A 74-year-old male patient was referred to our institution for further evaluation of duodenal stenosis identified during EGD conducted as part of a routine health checkup. His medical history was notable for atrial fibrillation.

3.2. Clinical Findings

At the time of presentation, the patient reported no difficulty with oral intake. Laboratory evaluations revealed no elevation in inflammatory markers or liver enzymes; however, serum CA19-9 was 46 U/ml, mildly elevated.

3.3. Diagnostic Assessment

Abdominal computed tomography (CT) demonstrated dilation of the bile and pancreatic ducts without evidence of a definitive obstructing mass. However, duodenal wall thickening was also noted. The esophagogastroduodenoscopy (EGD) revealed a circumferential, tumor-like lesion, extending from the duodenal bulb to the area proximal to the ampulla of Vater, characterized by an indistinct, whitish boundary. Histopathological examination demonstrated nonspecific inflammatory infiltration with focal atypical glandular structures but no definitive evidence

of malignancy. Endoscopic ultrasonography (EUS) revealed a hypoechoic lesion adjacent to the common bile duct, therefore pancreatic tumor was suspected. EUS-guided fine-needle aspiration (EUS-FNA) was performed; however, the sample obtained consisted solely of normal pancreatic tissue. The patient subsequently developed severe pancreatitis, necessitating intensive care management, aggressive fluid resuscitation, and antibiotic therapy. Follow-up contrast-enhanced CT revealed a cystic lesion consistent with a pseudocyst. A subsequent CT scan demonstrated persistent duodenal wall thickening, which contributed to the decision to proceed with surgical intervention.

Repeat EGDs were performed at 2 and 5 months, each including multiple biopsies. A second follow-up biopsy revealed serrated glandular architecture with nuclear atypia, pleomorphism, increased chromatin density, nuclear overlap, and loss of polarity, consistent with a serrated adenoma exhibiting neoplastic potential. Consequently, surgical resection was planned based on the suspicion of duodenal cancer.

3.4. Therapeutic Intervention

3.4.1. Surgical Findings

The presumed pseudocyst was identified as an abscess secondary to necrotizing pancreatitis. The abscess extended into the transverse mesocolon and small bowel mesentery, complicating the identification of the portal vein. During the procedure, extensive mesocolon incision resulted in inadequate colonic perfusion, necessitating aright hemicolectomy. The final surgical procedure included subtotal stomach-preserving pancreaticoduodenectomy, right hemicolectomy, and abscess debridement. The operation lasted 942 min, with an estimated blood loss of 3094 mL.

3.4.2. Pathological Findings

The lesion extended from the pyloric ring beyond the ampulla of Vater exhibiting diffuse thickening and fibrosis. The mucosa displayed serrated glandular proliferation with increased density, transitioning in some areas to moderately differentiated adenocarcinoma, which infiltrated adjacent structures including the bile duct and pancreas (Figure 5).

3.4.3. Follow-up and Outcomes

Initial postoperative recovery was complicated by poor drainage of the residual abscess; however, the patient was discharged on postoperative day 81. Five months later, the patient developed recurrent small bowel obstructions. Contrast-enhanced CT identified stenosis at the Braun anastomosis site, and EGD showed edematous mucosal changes distal to the stenotic region. Biopsy findings were consistent with those of recurrent duodenal cancer (Figure 6). Owing to impaired oral intake, gastrojejunostomy was performed 6 months after the initial surgery. The patient was discharged home thereafter, and plans were made to initiate palliative chemotherapy.

4. Discussion

Historically, most colorectal cancers were thought to develop via the adenoma-carcinoma sequence [1]. However, recent studies have proposed an alternative pathway involving serrated colorectal polyps, including hyperplastic polyps, sessile serrated polyps, and TSAs [2].

TSAs have increasingly been reported outside the colorectum [3], including in the esophagus, stomach, duodenum, pancreas, and gallbladder. A 2016 study by Rubio [4]. Reported 13 cases in the esophagus, 14 in the stomach, 15 in the duodenum, 16 in the pancreas, and 1 in the gallbladder. A literature review identified 36 cases of duodenal TSA, of which 11 cases (30.6%) demonstrated invasive adenocarcinoma [5,6].

Given the high malignant potential of TSAs in the upper gastrointestinal tract, early endoscopic or surgical resection is essential to reduce the risk of malignant transformation and to remove coexisting neoplasms, as observed in this case.

Although no previous reports have documented a duodenal TSA extending with an extent comparable to that observed in the present case, a review of the literature identified a limited number of cases offering insights into the endoscopic characteristics of duodenal serrated lesions. For instance, Fernandes et al. reported a pedunculated lesion with a villous surface in the second portion of the duodenum[6], whereas Ueno et al. [7]. Described a white elevated lesion featuring villous-like structures and dilated crypt openings on magnifying blue laser imaging [7]. Based on these characteristic endoscopic findings, including a white elevated lesion with a villous surface and dilated crypt openings, early identification of duodenal TSA may enable timely diagnosis and facilitate prompt therapeutic intervention.

In the present case, recognition of characteristic histopathological features during the initial endoscopy might have prompted earlier surgical intervention, potentially avoiding EUS-FNA and subsequent pancreatitis. Such an approach might have simplified the surgical procedure and favorably impacted the patient's prognosis.

5. Conclusions

We report a case of surgically resected duodenal serrated adenoma. Given its high malignant potential, early detection and intervention are essential for improving patient outcomes.

6. Authors' Contributions

Hajime Asai contributed to the study conception, data collection, and manuscript drafting. Kazuhiro Hiramatsu contributed to the manuscript review and final approval. Both authors have read and approved the final manuscript and agree to be accountable for all aspects of the work.

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