Introduction

Villous adenoma of the large intestine is quite rare in the Japanese population, accounting for only 1% of colonic adenomas\(^1\). In addition to morphological differences between tubular and villous adenomas, villous adenomas are more likely to be accompanied by malignant change\(^1\). Appendiceal villous adenoma can be found incidentally after surgical resection for appendicitis in adults\(^2\). In such cases, additional treatment depends on the findings of pathological examinations. The addition of lymph node dissection is recommended for tumors with malignant change, whereas careful observation is adequate if the tumor is not accompanied by malignant change and is completely resected. In contrast, the optimal intervention for a preoperative diagnosis of villous tumor of the appendix remains undetermined because there is insufficient evidence in the literature as to whether lymph node dissection at the time of second surgery for carcinoma in villous adenoma is as effective oncologically as one-step en-bloc resection of the ileocecal area and lymph nodes.

Clinical data

A 77-year-old woman was referred to KMS Hospital for treatment of villous adenoma of the appendix, which was identified via endoscopy. On physical examination, the patient had tenderness in the right lower abdomen. Blood tests showed slightly elevated serum carcinoembryonic antigen (CEA) concentrations (4.2 ng/mL; normal range < 3.4 ng/mL). Endoscopic observation of the cecum revealed an enlarged orifice of the appendix. Mucus excretion was evident and the surface showed a granular pattern (Fig. 1).

Abdominal computed tomography (CT) revealed that the tumor was 3 cm in diameter and accompanied by a cystic structure on the distal side. Strong accumulation of fluorodeoxyglucose (FDG) on FDG–positron emission tomography–CT and elevated serum carcinoembryonic antigen concentrations suggested malignant change. Consequently, laparoscopic ileocecal resection with regional lymph node dissection was performed. Pathologically, atypical cells with enlarged nucleus were arranged in the villous structure. Until the minimum surgical intervention is proven safe, when malignant change is likely, surgical resection with lymph node dissection should be considered.
Phy (PET)–CT showed strong accumulation of FDG in the tumor of the appendix (Fig. 2D), although no other abnormal accumulation, including in regional lymph nodes, was identified.

Due to the possibility of malignant change of the tumor, laparoscopic ileocecal resection with resection of regional lymph nodes at the root of the ileocolic artery (D2 resection) was performed. Pathologically, the tumor occupied half the appendix, from the middle part of the appendix to the orifice (Fig. 3A, B). Although invasion of cells beyond the mucosa was not observed, atypical cells with abundant nucleus were arranged in the villous, leading to a diagnosis of carcinoma in the villous tumor (Fig. 3C–F). No lymph node metastasis was identified. Postoperative course was uneventful, and the patient was discharged 8 days after operation.

Fig. 1 Endoscopic findings. A tumor with a granular and villous surface is observed at the orifice of the appendix. The excretion of mucous is evident.

Fig. 2 Findings of (A–C) computed tomography (CT) and (D) fluorodeoxyglucose (FDG)–positron emission tomography (PET)–CT. (A) CT revealed a tumor, 3 cm in diameter, without inflammation of the surrounding adipose tissue. (B) The tumor extended along the distal side of the appendix. (C) Fluid retention was observed at the distal tip of the appendix. (D) Strong accumulation of FDG was seen on FDG-PET-CT.
Villous adenoma is a relatively rare entity in Japan. Although in Western countries the rate of villous adenoma among all adenomas is approximately 10%, in Japan the rate is only approximately 1%\(^{(1)}\). In addition, more than 90% of villous adenomas occur in the sigmoid colon and rectum; only 1% of villous tumors are found in the appendix\(^{(1)}\). A tumor in the appendix often manifests as appendicitis in adults. Reports suggest that, in adults, up to 7% of specimens resected for acute appen-

**Discussion**

Villous adenoma is a relatively rare entity in Japan. Although in Western countries the rate of villous adenoma among all adenomas is approximately 10%, in
Villous tumor of the appendix

...dicitis are accompanied by benign or malignant tumors. Nevertheless, a preoperative diagnosis of tumor of the appendix remains rare.

Generally, the risk of malignant changes to adenomas is high if the tumor is large, it has components of villous adenoma, and it is accompanied by strong dysplasia on biopsy. In the present case, the patient had a villous adenoma that was 3 cm in diameter, and strong accumulation of FDG, suggesting the possibility of malignant change. The extent of surgical resection remains a matter of debate. Due to the thin proper muscle layer of appendix compared to that of the colon and rectum, and the abundant lymphatics surrounding the ileocecal area, lymph node metastasis of appendical adenocarcinoma is often identified. Because of the reduced postoperative complications associated with laparoscopic colon resection, we believe that laparoscopic resection of the ileocecal area and regional lymph nodes should be considered when malignant change is clinically suspected.

In conclusion, we report herein on a patient with villous adenoma of the appendix that was diagnosed preoperatively on endoscopy. When malignant change is likely, as in the present case, margin-negative resection with lymph node dissection should be considered. Only after the accumulation of cases supporting minimal surgery, appendectomy, or cecal resection without lymph node resection should be considered as the standard treatment option.

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References