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Case Report

Correlation of endoscopic images and histological findings of a high grade dysplasia developed in a gastric xanthoma

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Abstract: Gastric neoplasia developed in a xanthoma is very rare. We herein report a high grade dysplasia (HGD) arising in a gastric xanthoma removed by endoscopic submucosal dissection (ESD). A 57-year-old man was referred to our hospital for removal of rectal polyps. During surveillance esophago-gastro-duodenoendoscopy before polypectomy, an irregularly shaped gastric xanthoma with unusual color was found in the stomach. Although, magnifying narrow band imaging showed no typical neoplastic vessel or surface pattern on the surface and endoscopic biopsies revealed no tumor, diagnostic ESD was performed because of its irregular shape and unusual color for a commonly seen xanthoma. Histologically, a high grade dysplasia, 6 mm×6 mm in size, was detected within a gastric xanthoma. This is the first report of correlation of endoscopic images and histological findings of a HGD in a gastric xanthoma.

Keywords: Gastric xanthoma, high grade dysplasia, endoscopic submucosal dissection

Introduction

Gastric cancer is one of the most common causes of cancer-related deaths in the world [1], mostly arising in the gastric mucosa that has been infected with *Helicobacter pylori (H. Pylori).* As a result, detection of gastric cancer at an early stage can improve the survival rate. Gastric atrophy, which reflects chronic gastritis induced by *H. pylori* infection, is considered to be an important risk factor for gastric cancer, and accumulating evidence suggests that the severity of gastric atrophy is related to the incidence of early gastric cancer. Gastric xanthoma, which refers to yellowish-white small nodules or plaques in the gastric mucosa, is also considered to be related with *H. pylori* infection. Moreover, it is possible that the presence of gastric xanthoma, may reflect the severity and long duration of chronic gastritis, and gastric xanthoma is frequently observed in patients with open-type gastric atrophy, which is known to be an important risk factor for the development of gastric cancer. Notably, gastric xanthoma has been reported as a useful endoscopic marker not only for predicting the development of early gastric cancer but also for predicting its location, as gastric cancer often occurred in the same location of xanthoma [2]. However, early gastric cancer developed in a gastric xanthoma, is extremely rarely reported [3]. We herein reporte a case of a high grade dysplasia (HGD) developed in a gastric xanthoma, which was successfully treated by endoscopic submucosal dissection (ESD). The correlation of endoscopic images and histological findings is also presented and discussed.

Case report

A 57-year-old man was referred to our hospital for polypectomy of rectal polyps. No abnormalities of past history, family history, physical examination, laboratory data, and image findings other than endoscopy were identified. During surveillance esophago gastro duodeno-

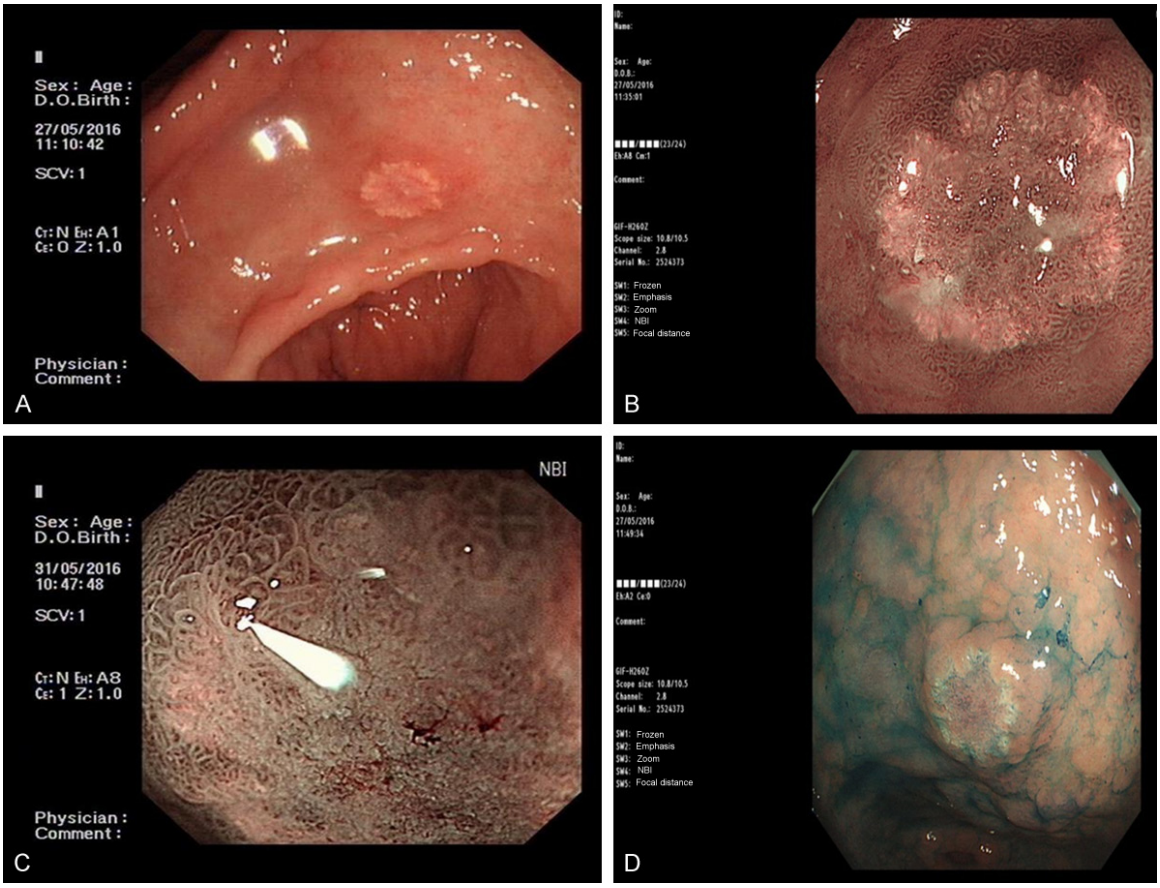

Figure 1. Endoscopic examination shows the irregular round protruding lesion with yellowish-white plaque on the lesser curvature of the anterior wall of the stomach. A: Was detected by conventional white light imaging; B: Was detected by narrow band imaging (NBI); C: Was detected by NBI-ME; D: Was detected by methylene blue staining.

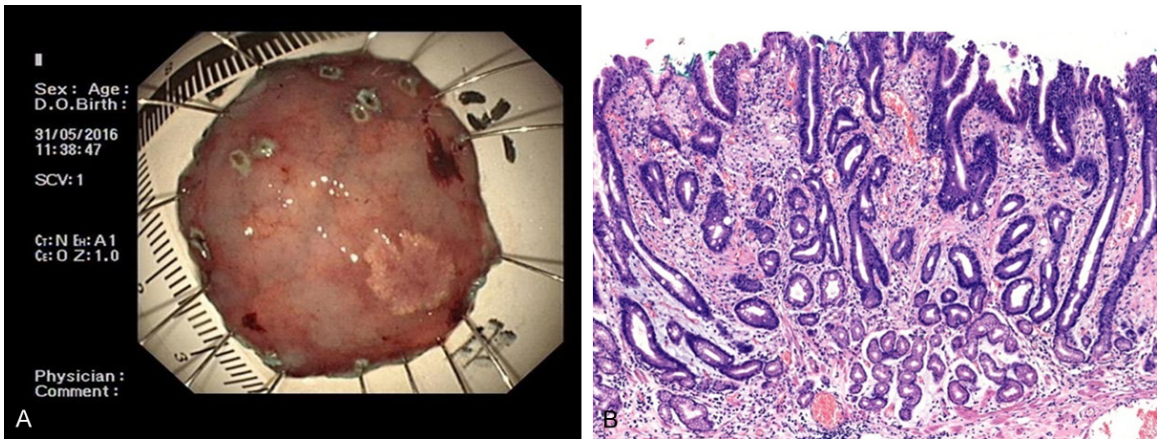

Figure 2. Endoscopic submucosal dissection (ESD) was performed and histological examination of the resected specimen is shown as high atypical hyperplasia in the xanthoma mucosa. A: Shows the resected specimen by ESD; B: Shows the histological examination of the ESD specimen (H&E, ×200).

endoscopy (EGD) before polypectomy, a flat elevated lesion covered with yellowish-white plaque, 15 mm in size, of which suggested a gastric xanthoma, was found on the lesser curvature of the posterior wall of the stomach. With image-enhanced endoscopy such as nar-

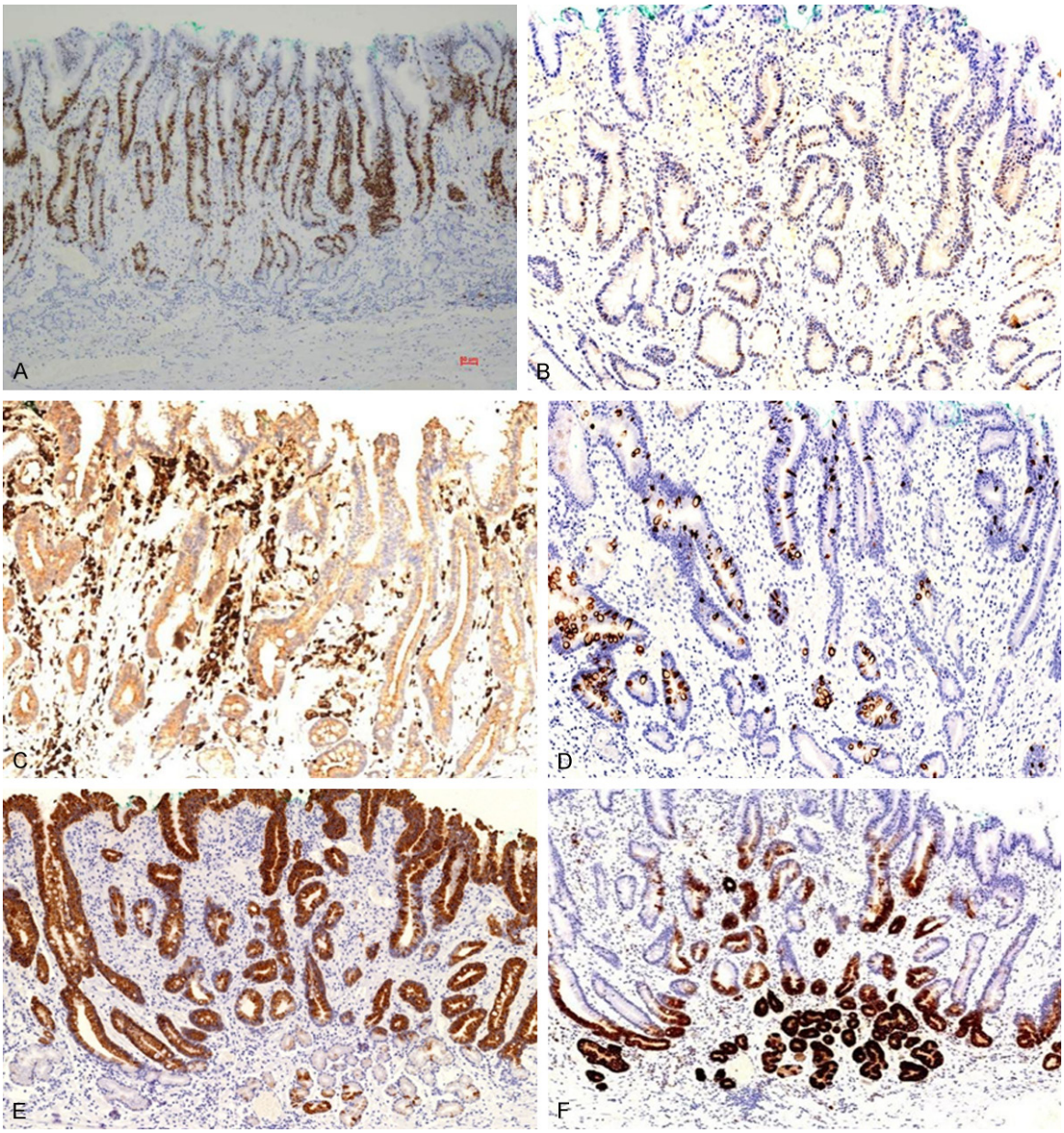

Figure 3. Immunohistochemical examination of the ESD specimen. A-C: Shows high expression of Ki67, p53, and CD68; D-F: Shows MUC2, MUC5AC and MUC6, respectively (immunohistochemical, ×200).

row band imaging (NBI) and chromoendoscopy using 0.12% methylene blue staining,the boundary of the lesion was irregular in shape and a shallow reddish depressed area was also seen in the lesion. Furthermore, magnifying NBI revealed scattered irregular vessels and surface patterns in the reddish area, however, no typical neoplastic vessel or surface pattern within a demarcated area as reported by Yao T et al. [4] was seen (**Figure 1**).

Four endoscopic biopsies showed only severe atrophic gastritis and intestinal metaplsasia, however, diagnostic ESD was performed with informed consent obtained, as the above-mentioned endoscopic findings were unusual as those seen in a normal gastric xanthoma. The lesion was successfully resected as *en bloc* with ESD. Histologically, a HGD, 6 mm×6 mm in diameter, was detected within the gastric xanthoma (**Figure 2**). By immunostaining, almost

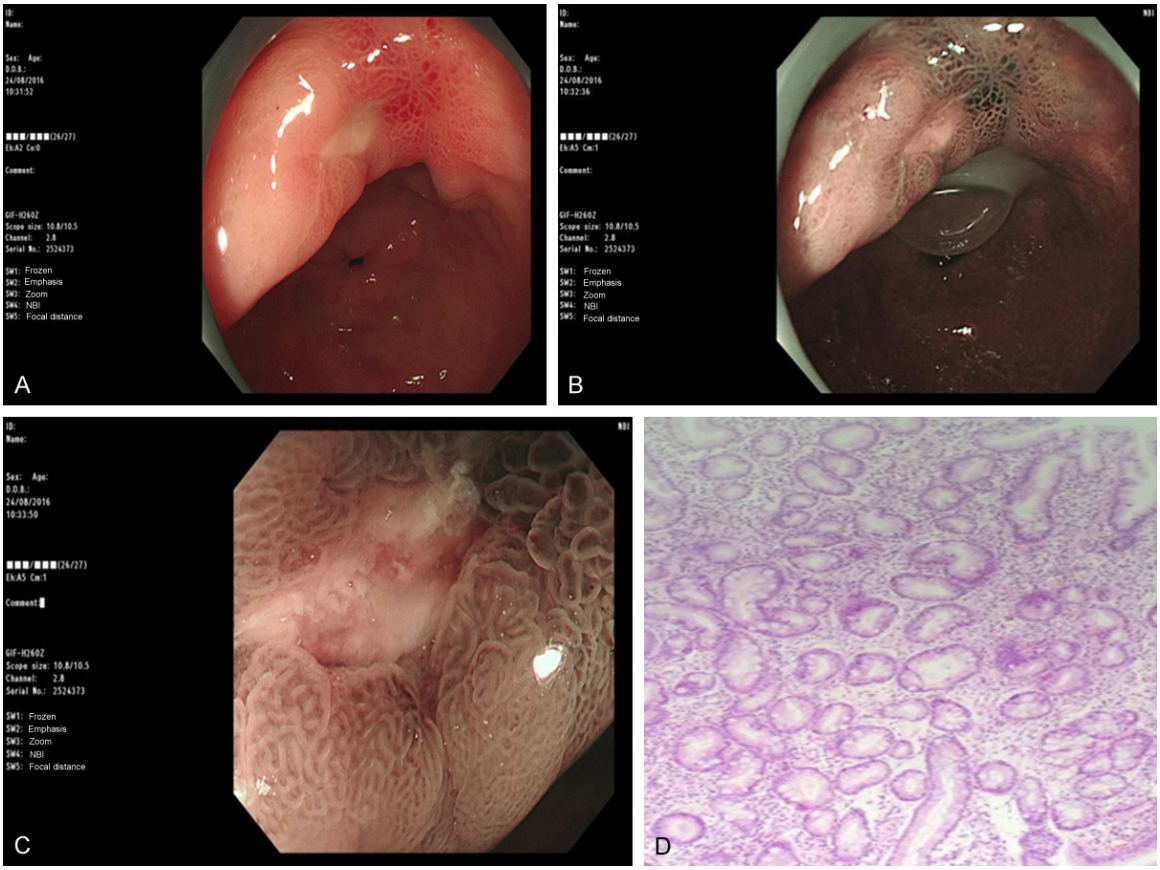

Figure 4. The resected lesion was rechecked endoscopically after 3 months. A: Shows the lesion by conventional white light imaging; B: Shows the lesion by narrow band imaging (NBI); C: Shows the lesion by NBI-ME; D: Shows histological examination of lesion (H&E, ×200).

all layers of the neoplastic lesion showed high expression of Ki-67, p53, CD68, and expression of MUC2, MUC5AC and MUC6 in different areas (**Figure 3**).

Surveillance endoscopy, performed 3 months after ESD, revealed a 0.3×0.3 cm artificial ulcer at its healing stage. No neoplastic vessel or surface pattern was seen with magnifying NBI. Moreover, no residual tumor but gastric atrophy was detected by endoscopic biopsies (**Figure 4**).

Discussion

We have reported a HGD that developed in a gastric xanthoma. Xanthoma, characterized by the accumulation of lipid in histiocytic foam cells [5, 6], is thought to be the result of an inflammatory response to mucosal damage or aging. As known xanthoma is characterized by oxidized low-density lipoprotein (LDL), Karserling et al. reported that accumulating of oxidized LDL cholesterol may include increased release of oxygen-free radicals. Additionally, oxygen-free radicals may cause DNA damage and associated oncogenic changes [7]. Thus, excessive production of free radicals may cause not only gastric xanthoma but also the gastric neoplasia.

Endoscopically, gastric xanthoma is characterized by yellowish-white plaque especially in the antrum or the pyloric region, is between 0.5 and 10 mm in size, and can be single or multiple. Histologically it consists of foamy macrophages in the lamina propria. Unlike usual gastric xanthomas [8], our case was larger and heterogeneous in color (fainted redness in addition to yellowish-white), and the boundary of the lesion was irregular in shape and a shallow depressed area was also seen in the lesion. In addition, scattered irregular vessels and surface patterns were detected by magnifying NBI.

Therefore we decided to perform diagnostic ESD even if the endoscopic biopsies were negative of tumor. Careful examination of the histology of the resected specimen revealed that the HGD was covered by normal glands in part especially at the mucosal surface. This explained the reason why our endoscopic biopsies were negative of tumor as they were taken too superficially, and explains why the color of the lesion was heterogeneous in color. Moreover, abundant foamy cells replaced the lamina propria resulting in a decrease of the density of non-neoplastic and neoplastic glands, of which also support the findings of the scattered irregular vessels and surface patterns shown by magnifying NBI.

In conclusion, we have presented a gastric HGD developed in a xanthoma completely resected by ESD. The possibility of histogenesis and the correlation of endoscopic findings and histology arediscussed. The endoscopic images might be helpful for further detection of similar cases.

Disclosure of conflict of interest

None.

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