

A Large Flat Adenoma Located on the Pylorus Ring Successfully Treated by Endoscopic Submucosal Dissection

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Introduction

Endoscopic mucosal resection (EMR) is a recognized treatment for early gastric cancer and is beneficial for patients because of its low level of invasiveness [1–3]. A one-piece resection is considered to be the gold standard of EMR, as it provides an accurate histological assessment and reduces the risk of local recurrence [1–3]. However, it is difficult to resect large and ulcerative lesions by conventional EMR techniques so a new technique of endoscopic submucosal dissection (ESD) has been developed [4–7]. The primary aim of this technique is to obtain one-piece resection during EMR. ESD has the advantage of permitting en bloc and histological complete resection. On the other hand, this method has the disadvantage of a long performance time and high frequency of complications as well as the need for a high level of technical skill [2, 4–7].

We experienced here a large flat adenoma located on the pylorus ring which was successfully treated with ESD. Endoscopic findings during ESD are presented and the treatment for such lesions is discussed.

Case report

A 76-year-old male was discovered to have an elevated lesion on the pylorus ring by his primary physician during a routine checkup using an upper gastrointestinal fiberscope. Thereafter, he was admitted to our hospital for treatment. The pathological findings of a biopsy specimen showed tubular adenoma with severe atypia. The patient's history was unremarkable and there were no abnormalities in the blood chemistry. ESD was selected as the treatment after informed consent was obtained. The endoscopic findings during ESD are shown in Fig. 1. A flat elevated lesion located from the pylorus ring to the duodenum observed with conventional and chromoendoscopy with indigo carmine. The equipment used was a single-channel endoscope (Olympus XQ260; Olympus Optical Co., Tokyo) with a hood (D-201-11804; Olympus) and a high-frequency generator with an automatically controlled system (Erbotom VIO 300D; ERBE, Tuebingen, Germany). Intravenous administration of petidine hydrochloride and propofol was performed for sedation. Tumors were treated by ESD procedures using a Flex knife (KD-630L; Olympus) in combination with a Hook knife (KD-620LR; Olympus). Briefly, dots were marked on the circumference of the lesion from the oral and anal sides. Next, several milliliters of a submucosal injection solution was injected with a 23-gauge disposal injection needle around the lesion to lift it off the muscle layer. Sodium hyaluronate with a small amount of indigo carmine and epinephrine was used for the submucosal injection solution. Thereafter, incision of the mucosa outside the marking dots was done in the Endocut mode (effect 3; 80 W) to separate the lesion from the surrounding nonneoplastic mucosa. The submucosal connective tissue just beneath the lesion was then gradually dissected in the swift coagulation mode (40 W) from the muscle layer. Visible exposed vessels on

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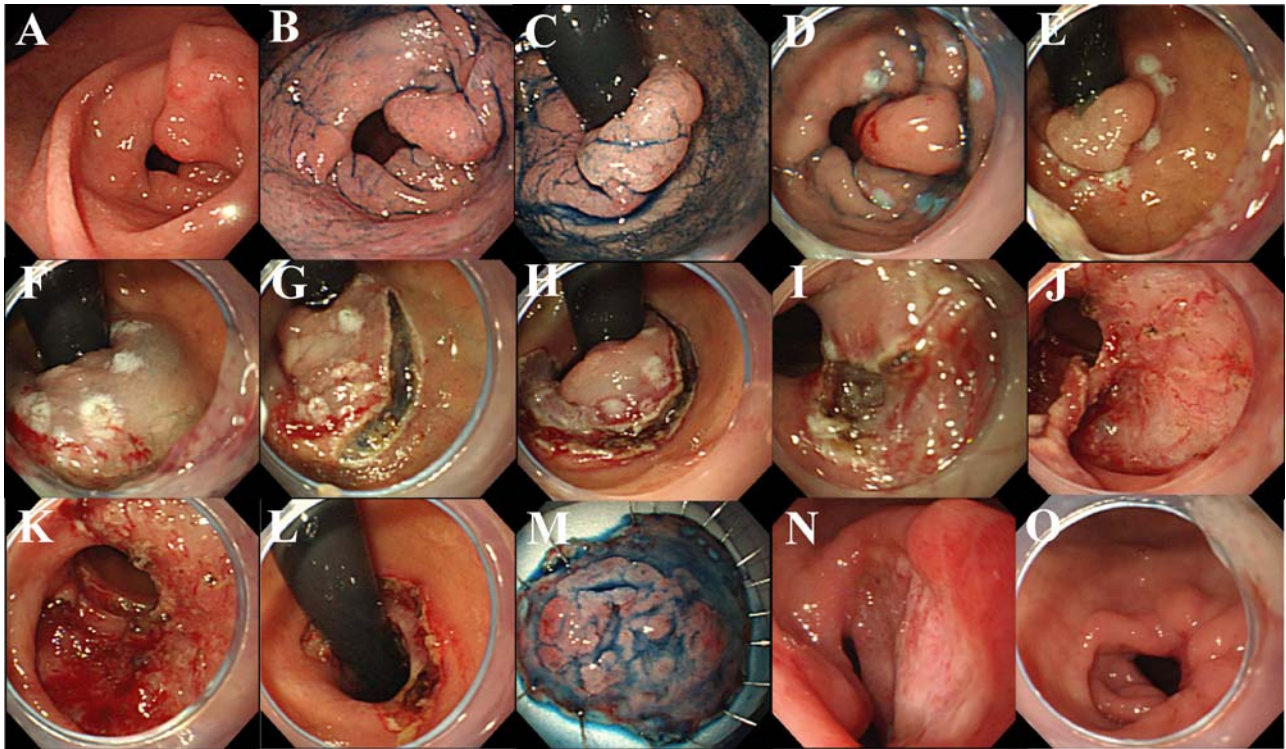


Fig. 1 Endoscopic findings during and after endoscopic submucosal dissection (ESD). (A) A flat elevated lesion was located from the pylorus ring to the duodenum. (B) Chromoendoscopy with indigo carmine. (C) View from the duodenum. (D, E) Dots were marked on the circumference of the lesion from the oral and anal sides. (F) Several milliliters of the submucosal injection solution with hyaluronic acid was injected around the lesion to lift it off the muscle layer. (G, H) Incision of the

mucosa outside the marking dots was made to separate the lesion from the surrounding nonneoplastic mucosa. (I, J) The submucosal connective tissue just beneath the lesion was gradually dissected from the muscle layer. (K, L) The lesion was cut completely from the muscle layer. (M) The resection size was 46×36 mm; the lesion size was $28 \times 17 \times 3$ mm. (N) Follow-up 1 week after ESD. (O) There was no stenosis or local recurrence 9 months after the ESD procedure

the artificial ulcer were coagulated with Coagrasper (FD-410LR; Olympus) in the soft coagulation mode (60 W). Finally, the lesion was cut completely from the muscle layer without snaring. The resection size was 46×36 mm, and the lesion size was $28 \times 17 \times 3$ mm. The resection specimen was stained with hematoxylin and eosin after being cut into 2-mm slices, and was examined microscopically regarding histopathologic type, lateral and vertical resection margin involvement, and lymphatic or venous invasion. The definitive histology of the resected specimen was tubular adenoma with severe atypia. A histological en bloc resection with tumor-free margins was confirmed. The operation time was 100 min. There were no problematic complications either during or after the ESD procedure. Endoscopic follow-up examinations were routinely performed at 1 week, 3 months, and 9 months after ESD, and every 6 months thereafter, at our hospital. There was no stenosis or local recurrence 9 months after the ESD procedure.

Discussion

En bloc resection has been proposed as the gold standard of EMR, as it helps in accurate histological assessment and

reduces the risk of tumor recurrence [1–3]. With conventional EMR technique in early gastric cancers of a smaller size (≤ 20 mm) and with no ulceration, the one-piece resection rate was reported as 76% in a review of Japanese literature [8]. Development of new EMR techniques, such as ESD, has revolutionized the management of early gastric cancer. ESD enables treatment of even large and ulcerative gastric cancers and also achievement of an accurate histological diagnosis [2, 4–7]. However, ESD requires a high level of expertise and experience and the operation time also tends to be long [2, 4–7]. Gastric wall perforation and bleeding are common complications with ESD. The complication rate of perforation has been reported to be about 5% [9, 10]. The risk of perforation or immediate bleeding is higher in technically difficult cases [9].

The indications for ESD for early gastric cancers at our institute are as follows: (i) differentiated adenocarcinoma, intramucosal, without any ulcer findings, irrespective of the tumor size; (ii) differentiated adenocarcinoma, intramucosal, with ulceration, ≤ 30 mm; and (iii) differentiated adenocarcinoma, minute submucosal penetration (sm1), ≤ 30 mm. Cases in which submucosal invasion was suspected are evaluated by endoscopic ultrasonography. Although the

indications for ESD for early gastric cancers are normally based on these criteria, extended criteria were also used in order to obtain an accurate histological diagnosis. In this case, gastric lesions were located on the pylorus ring and duodenum. An en bloc resection was considered difficult in this case. It is impossible to make an en bloc resection using conventional EMR. However, an en bloc resection helps to make an accurate histological assessment while also reducing the risk of tumor recurrence. Although a biopsy specimen did not show adenocarcinoma, it contained severe atypia. As a result, an en bloc resection was found to be useful for making an accurate histological assessment and also for effectively treating this case. A distal gastrectomy can achieve an en bloc resection but it is invasive in comparison to endoscopic treatment.

In conclusion, we have reported here a large flat adenoma located on the pylorus ring that was successfully treated with ESD. ESD is also useful even when a tumor is located in the pylorus ring.

References

1. Yamamoto H, Kita H (2005) Endoscopic therapy of early gastric cancer. *Best Pract Res Clin Gastroenterol* 19:909–926
2. Ono H, Kondo H, Gotoda T, Shirao K, Yamaguchi H, Saito D, Hosokawa K, Shimoda T, Yoshida S (2001) Endoscopic mucosal resection for treatment of early gastric cancer. *Gut* 48:225–229
3. Adachi Y, Shiraishi N, Kitano S (2002) Modern treatment of early gastric cancer: review of the Japanese experience. *Dig Surg* 19:333–339
4. Hirao M, Masuda K, Asanuma T, Naka H, Noda K, Matsuura K, Yamaguchi O, Ueda N (1988) Endoscopic resection of early gastric cancer and other tumors with local injection of hypertonic saline-epinephrine. *Gastrointest Endosc* 34:264–269
5. Gotoda T, Kondo H, Ono H, Saito Y, Yamaguchi H, Saito D, Yokota T (1999) A new endoscopic mucosal resection procedure using an insulation-tipped electrosurgical knife for rectal flat lesions. *Gastrointest Endosc* 50:560–563
6. Yamamoto H, Kawata H, Sunada K, Sasaki A, Nakazawa K, Miyata T, Sekine Y, Yano T, Satoh K, Ido K, Sugano K (2003) Successful one-piece resection of large superficial tumors in the stomach and colon using sodium hyaluronate and small-caliber-tip transparent hood. *Endoscopy* 35:690–694
7. Oyama T, Kikuchi Y (2002) Aggressive endoscopic mucosal resection in the upper GI tract-Hook knife EMR method. *Min Invas Ther Allied Technol* 11:291–295
8. Kojima T, Parra-Blanco A, Takahashi H, Fujita R (1998) Outcome of endoscopic mucosal resection for early gastric cancer: review of the Japanese literature. *Gastrointest Endosc* 48:550–554
9. Oda I, Goyoda T, Hamanaka H, Eguchi T, Saito Y, Matsuda T, Bhandari P, Emura F, Saito D, Ono H (2005) Endoscopic submucosal dissection for early gastric cancer: technical feasibility, operation time and complications from a large consecutive series. *Dig Endosc* 17:54–58
10. Kato M, Shimizu Y, Nakagawa S, Sugiyama T, Asaka M (2003) The results of questionnaire about endoscopic mucosal resection in stomach. *Dig Endosc* 15:S2–S7