

Endoscopic Submucosal Dissection for Early Gastric Cancer: Case Series

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ABSTRACT

Introduction: Regardless of the technical achievements and treatment options, gastric cancer remains with high incidence and mortality in some parts of the world, including Eastern Europe. In our practice we used Endoscopic Submucosal Dissection (ESD) as treatment of histologically verified early gastric cancer or high-grade dysplasia.

Patients and Methods: We performed a retrospective study of 10 patients diagnosed with the above-mentioned lesions without signs of deep mucosal invasion, lymphogenic or metastatic dissemination. All of them underwent ESD resulting in en bloc resection of the process, its extraction and further examination.

Results: Data from the en bloc histological examination showed two cases of severe dysplasia and eight lesions positive for cancerous cells. Two of the patients with early gastric cancer were sent for surgical treatment due to deep submucosal infiltration and recurrence on the third month respectively. The other eight subjects have been enlisted in endoscopic control according to the international guidelines for both curative and non-curative ESDs with excellent results.

Conclusions: We concluded that ESD is a safe, well-tolerated organ-preserving procedure, when used in the indicated cases and by experienced endoscopist.

Key words: endoscopic submucosal dissection, early gastric cancer, high-grade dysplasia

INTRODUCTION

Gastric cancer incidence has declined significantly worldwide over the past half-century, but remain disproportionately high in East Asia, Latin America and Eastern Europe (1). Early gastric cancer (EGC) is defined as a cancer confined to the mucosa or submucosa, regardless of lymph node metastasis (2). Adenocarcinomas, which are the most common type of stomach cancer, are associated with *H. pylori* infection, which is involved with progressive and long-standing mucosal inflammation, followed by mucosal atrophy and culminating

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in intraepithelial and finally advanced neoplasia. Gastric cancer is associated with well-defined precancerous lesions of mucosal atrophy and metaplasia that can be easily identified endoscopically and confirmed by histology (1). In the past, the standard treatment of gastric cancer was surgical resection; however, the endoscopic treatment has increased due to advances in the instruments available and clinician experience (3).

In this paper we present our experience with Endoscopic Submucosal Dissection (ESD) for early gastric cancer and high-grade dysplasia in the gastric mucosa.

PATIENTS AND METHODS

This was a retrospective study including ten patients with previously histologically verified superficial neoplastic lesions (low or high grade noninvasive neoplasia, adenocarcinoma with no evidence of deep submucosal invasion). In the period of two years, we performed ten gastric ESD on ten different subjects aged 36 to 80, that showed no sign of deep submucosal invasion, lymphogenic or metastatic dissemination from the endoscopic and imaging methods. Eight of the finding were located on the lesser curvature, while the other two were situated on the greater curvature and prepyloric part of the stomach. Nine of them were elevated lesions and one was a flat lesion. No ulcerations of the lesions were established. All of the above-mentioned patients gave written permission before they underwent the procedure.

An Olympus GIF-2TH180 (Tokyo, Japan) video-gastroscope, covered on the distal end with Olympus Soft Cap was used to locate and asses the lesion. The Olympus DualKnife™ was then used to mark approximately 5 mm in healthy tissue around the lesion. A solution of Gelofusine, Indigocarmine and Adrenaline was injected in the submucosa to lift the lesion and circular incision began 2 to 3 mm out of the markings. The Olympus ITknife2™ was then used to perform continuous dissection combined with swift coagulation. If we were to happen upon a greater vessel, we used mono- or bipolar Olympus Coagrasper for electrocoagulation.

Once the en bloc resection of the lesion was completed a grasper was used for extracting the material and histological examination on it was performed.

RESULTS

Histological tests performed on the en bloc material stated that two of the lesions were high grade

dysplasia, while the other 8 were positive for cancerous cells. All of the histological finding were displayed in *table 1*.

The patient with deep mucosal infiltration present was immediately send for operative treatment of the gastric cancer. One of the patients had infiltration of lamina muscularis mucosae without submucosal infiltration, but tumor emboli were found in two lymph vessels. They remained for endoscopic control on the third month after the procedure and recurrence of cancer was found in the place of the previous ESD. No lymph or distant metastases were found on the control CT scans. This patient was directed to surgical unit for further treatment. The other eight subjects had endoscopic control at least once when the data was collected. None of them had moderate or severe dysplasia, or cancerous cells in the place of the ESD on the third month of the procedure. One patient showed mild dysplasia in the ESD place on the 1st year control VGS. There were no perforations registered and no severe post-procedure complications.

DISCUSSION

Screening programs for early gastric cancer really haven't been established outside of Asia. Although, epidemiology reports concerning the Bulgarian population on the subject haven't been published, the estimated incidence of gastric cancer diagnosed as EGC in Europe is 10 to 15% (4). In order to predict the presence of symptomatic or asymptomatic gastric lesions there are certain demographic and clinical features that should be taken into account - ethnicity, gender, age, family history of gastric cancer, H. pylori infection, smoking. The age threshold for endoscopic and histologic screening is considered 40 years in high-risk regions and 50 years in low-risk regions

Table 1 - Histological data of our patients

Criteria	Number of findings N=10
Severe Dysplasia	2
Gastric cancer	8
Well differentiated	6
Moderately differentiated	1
Undifferentiated	1
Cancer confined to mucosa	3
Infiltration of the lamina muscularis mucosae	5
Superficial submucosal infiltration	1
Deep submucosal infiltration	1
Clear resection lines	8
Lymphatic invasion	2

(5,6). The following screening could differ from a couple of months to 3 years depending on the endoscopic and histological findings (7).

According to both the Japan Gastroenterological Endoscopy Society Guideline and the European Society of Gastrointestinal Endoscopy (ESGE) Guideline en bloc resection of nonulcerated well-differentiated intramucosal adenocarcinomas without lymphovascular invasion, regardless of the size is considered to be curative (4,8). That conclusion is based on a Gotoda et al. data in the largest series of early gastric cancers, involving 929 patients who underwent gastrectomy for intramucosal gastric cancer and no lymph node metastasis were found. Any case that did not meet the criteria was considered non-curative (9). In our case series we had 5 curative and 5 non-curative ESDs. For the non-curative patients, we used the eCura system to determine the approach. When evaluating the curability, we classified the cases the following way: five cases were considered eCura A, one case eCura B, two cases eCuraC1 and two cases eCuraC2. Following the recommendations of the Japan Gastroenterological Endoscopy Society the eCura A and eCura B cases were subjected to endoscopy twice in the first year and annually thereafter, combined with CT scan for the eCura B case. As for the eCura C1 cases after explaining the possible strategies to the patients and with their consent, close observation with endoscopic, histological and CT follow up every three months for the first year and then annually began. One of the eCura C2 patients was immediately sent for surgical treatment, while the other was subjected to close observation due to multiple comorbidities and had recurrence of the cancer on the first follow up (8).

According to a study of 457 patients comparing the 5-year overall survival rates of patients treated with ESD or surgery for early gastric cancer, both of the treatment approaches had similar long-term overall survival rate - 97.5% and 97.0% respectively (10). In their large-scale multicenter study Gotoda et al also concluded no further treatment is needed for curative ESD. As for the ESD in patient in the low-risk group, data showed a low rate of lymph node metastasis and a high cancer-specific survival and low cancer recurrence in the validation cohort (11).

The presented case series had a lot of limitations being a retrospective study and having only 10 patients in it. We had yet to perform long-term endoscopic and CT control, but our results so far aligned well with the data presented from other international teams.

CONCLUSION

We conclude that endoscopic submucosal dissection is a safe organ-preserving procedure in the treatment of early gastric cancer, when used on the indicated lesions. The curative and low-risk non-curative ESD have low rate of lymph node metastasis and high cause-specific survival.

Author contributions

N.B. designed and performed the experiments. L.K. and N.S. performed the follow up exams. K.S. and K.M. and D.D. gathered and analyzed the data. K.S. wrote the manuscript in consultation with V.A. and N.B.

Competing interests

The authors declare that they have no competing interests.

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Ethical statement

All patients gave written consent before the procedure.

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