Ulceration and Fibrosis

Hang Lak Lee, M.D.
Department of Internal Medicine, Hanyang University Hospital, Seoul, Korea

Introduction

Early gastric cancer (EGC) is defined as a gastric cancer that is confined to the mucosa or submucosa, irrespective of the presence of regional lymph node metastasis. The ESD procedure allows precise histological assessment of the resected specimen and prevents residual disease and local recurrence.

Endoscopic submucosal dissection (ESD) is a novel endoscopic treatment that enables a clinician to resect a target lesion en bloc. For the last ten years, ESD has been performed in Korea for the management of early gastric cancer. ESD for EGC is comparable to conventional surgery in many aspects, and it has the advantage of being less invasive and more economical. In this article, we introduce the technique of ESD in case of submucosal fibrosis.

The degree of submucosal fibrosis in early gastric tumors

Endoscopically, the degree of submucosal fibrosis was classified as follows, based on the findings obtained after a solution including indigo carmine was injected under the submucosal layer (Fig. 1): F0, no fibrosis, which
Figure 2. Sections of endoscopic submucosal dissections, showing representative findings of submucosal fibrosis. (A) F0, no fibrosis. (B) F1, mild fibrosis. (C) F2, severe fibrosis. (Masson’s trichrome stain, orig. mag. ×40.)

appeared as a blue transparent layer; F1, mild fibrosis, which appeared as a white web-like structure in the blue submucosal layer; and F2, severe fibrosis, which appeared as a white muscle-like structure without a blue transparent layer.5

Histologically, the degree of submucosal fibrosis was evaluated by an expert pathologist using slides stained with hematoxylin and eosin and with Masson’s trichrome, without knowledge of any clinical data. The intensity of histologic submucosal fibrosis was scored as 0 (negative stain, no fibrosis, nearly normal appearance), 1 (weak fibrosis), and 2 (dense fibrosis). The extent of fibrosis on the same slides was assessed from the percentage of the total area that was stained with Masson’s trichrome stain, as follows: 0 (0%–10%), 1 (11%–50%), and 2 (51%–100%). The final staining score was obtained as the sum of the intensity and extent scores. Fibrosis with a final score of 0 was considered as no fibrosis (F0), 1 and 2 as mild fibrosis (F1), and 3 and 4 as severe fibrosis (F2) (Fig. 2).

ESD techniques in submucosal fibrosis

The success rate of ESD depends on the technical proficiency of the endoscopist and the condition of the gastric tumor. Even for a skilled endoscopist, however, submucosal fibrosis can be an obstacle to success.6–9 Submucosal fibrosis, which usually results from inflammation or tumor invasion,10 makes it harder to lift the tumor tissue from the muscle layer. This in turn lengthens the procedure time, creates risk of complications such as perforations, and reduces the success rate of complete en bloc resection.11

In general, to perform resection with fibrotic portions, lesions around the fibrotic portions should first be dissected to evaluate the anatomic relationship between the muscle and submucosal layer. Dissection toward the fibrotic portion should then be performed. In addition, a knife with a firm body would be more helpful in dissecting these portions.

For example, a fixed Flex knife is more convenient than an ordinary Flex knife in such situations.16 Submucosal injection with normal saline solution may not achieve adequate lifting in cases with submucosal fibrosis.

However, sodium hyaluronate may be a good choice in ESD cases with submucosal fibrosis because it does not cause tissue damage, and it has an ability to maintain submucosal lifting compared with other injection fluids because of its high viscosity.12

In our study, we found that submucosal fibrosis of early gastric tumors was closely related to tumor size, loca-
tion, ulceration, histologic features, and submucosal invasion.

Also, more severe submucosal fibrosis was associated with prolonged ESD and with complications such as perforation and immediate bleeding. This study is significant in that it appears to be the first that seeks to identify factors related to submucosal fibrosis during ESD, as well as associations between the degree of submucosal fibrosis and ESD outcomes.

Conclusions

When such findings associated with submucosal fibrosis are seen, the endoscopist needs extra caution because the chances of complication encountered through ESD may be higher. However, we think that a large prospective study is needed to confirm the associations between submucosal fibrosis and the various associated factors.13,14

References