Indications and technical aspects of ESD

Thank you chairman for your nice introduction. It's a great honor for me to talk in this prestigious meeting today.

Topics of my presentation will include various issues of ESD.

I'd like to start with brief history of gastric ESD in Korea.

Because small EGCs are found more frequently, we are doing more and more endoscopic treatments of EGCs. This is the first small clinical report on endoscopic treatment of early gastric cancer in Korea in 1996. Professor 정현채 performed all the procedures, and I was the first author of that report. At that time, I was a senior resident at Seoul National University Hospital.

This is one of my early personal experiences of gastric ESDs in 2005. Because endoscopic resection of EGC was not popular at that time, I carefully explained the difference between surgery and endoscopic resection to the patients.

In the year 2011, national medical insurance started to reimburse the cost of gastric ESD after a hot debate between the government and the endoscopy society. Regarding the insurance coverage, there is an important limitation that only the cases in the conventional indications, such as differentiated-type mucosal cancer less than 3 cm, are covered. We are still trying to expand the government indications.

This is the general information about the current status of ESD for EGC in Korea. From November 2011 to December 2014, number of ESD for EGC cases was more than 23 thousands. In the year 2014, 7,734 ESDs were done for Korean EGC cases. The mean age of patients were 65 years and male was 74%. Mean duration of hospital stay was 5 days. Mean medical cost in 2014 was 1,305 US dollars. Surgery was done in 6.6% within 3 months.

ESD study group of the Korean Society of GI Endoscopy started an on-line ESD registry program, and patient enrollment is ongoing.

Next topic is indications.

This slide shows how we are doing at my institution. Excluding palliative surgeries, we have endoscopically or surgically treated more than seventeen hundred gastric cancers in the year 2012. Among them, 72% were early gastric cancers. In early gastric cancers, cases within absolute indications were 25% and more than 90% of them were treated endoscopically. In this pie graph, you can see 263 adenomas with low grade or high grade dysplasia. All of them were treated endoscopically. Patients with small adenomas, which were treated by endoscopic ablation, were not included in this graph. So, endoscopic treatment of gastric adenoma is a huge workload for Korean endoscopists.

Before further discussion, I’d like to make the definitions clear. Indications are different from criteria. Indication is something that we consider before the treatment. Criteria is something we consider after the treatment.

There are two types of indications. Absolute indication means differentiated type mucosal cancer without ulcer and not bigger than 2 cm. Expanded indications include differentiated type EGCs bigger than 2 cm and selected cases of undifferentiated type EGCs.

In Korea, ESD candidates are usually selected by the absolute indications. After ESD, expanded criteria is applied to determine whether the resection was curative. There are controversies about the safety of ESD for expanded indication cases. It’s partially because Korean studies consistently showed higher risk of lymph node metastasis in expanded indication cases than Japanese data. I’ll show you some examples.

Researchers at Korean National Cancer Center examined the risk of lymph node metastasis in mucosal EGC meeting the curative resection criteria. As you can see, The risk of lymph node metastasis was about 1 percent.

In my institution, we examined the risk of lymph node metastasis in signet ring cell mucosal EGCs. When the tumor is larger than 1.7cm, the risk was not negligible.

Do you think total gastrectomy was necessary for a 45 years old lady with 1 cm signet ring cell carcinoma? In my opinion, it was too much. Less invasive options should be considered.

What would you recommend for a 40 years old woman with a small flat signet ring cell carcinoma?

I performed ESD and the final pathology was SRC, 10 mm, limited in the lamina propria layer, clear resection margins, and no lymphatic invasion.

ESD for expanded indication cases can be selectively performed in the individual cases. Flat small signet ring cell carcinomas are frequently treated by ESD in Korea.

Next topic is the outcome. Although there are 4 or 5 major centers reporting similar results in Korea, I would mostly talk about our own experience at Samsung Medical Center.

Outcome of endoscopic treatment of EGC with differentiated histology is well established. We have ITT analysis such as comparison with surgery using propensity score matching. We also have PP analysis such as long-term follow-up data after curative resection or non-curative resection.

At my institution, we performed a propensity score-matching analysis between the two groups, endoscopic resection or surgery for differentiated type EGCs.

The overall survival was almost the same in the two groups. Because of the metachronous recurrences, disease free survival and recurrence free survival is better in the surgery group. However, there was no difference in the disease specific survival.

Next evidence is the PP analysis. It’s a single-arm long-term follow-up data for curatively resected differentiated-type EGCs.

Excluding metachronous recurrences, we experienced only one case of local recurrence, and 2 cases of extragastric recurrences.

This is the overall survival. There was no statistical difference between absolute indication and expanded indication.

There are the pictures of the two extragastric recurrences in our series. The top case belonged to the absolute indication group, and the lower case belonged to the expanded indication group.

Many centers recently reported long-term outcome after ESD in Korea. The rate of extra-gastric recurrence is usually less than 0.2%.

This is another PP analysis for non-curatively resected differentiated type EGCs. In cases with risk of lymph node metastasis, 70% were operated, and 30% were observed without surgery.

In the surgery group, 11 have lymph node metastasis, which means 5.7%. Patients with lymph node metastasis were older. To our surprise, the rate of lymph node metastasis was not different by the tumor size, depth of invasion, histological differentiation, and lymphovascular invasion in the endoscopically resected specimen. So, basically we found no predictor of lymph node metastasis in this analysis.

In terms of the overall survival, additional surgery was related with better outcome.

Survival benefit of additional surgery after non-curative resection was shown in a propensity matched study by doctor Eom at Korean National Cancer Center. As you can see at the right-hand side picture, the overall mortality of observation group was higher than that of the matched initial standard surgery patients.

Final topic is education.

There are so many different types of ESD knives in the market. We need to understand characteristics of each instrument. My favorite tool is Dual knife and IT-2 knife.

Recently we are also using Korean ESD knifes. Some of them have water-jet functions.

Due to the time limitation, it is difficult to talk a lot about technical aspects of ESD. This is how I do the circumferential precutting with needle type knife - left side first, right side second, and finally horizontal cutting of the proximal part.

Management of complications is a great part of ESD education. Most perforations can be treated endoscopically without surgery.

When the resection is big and close to the cardia or pylorus, short-term oral steroid can be used for the prevention of obstruction.

The hospital stay for gastric ESD is usually 4 days.

For the beginners, hands on training using a pig stomach model is very useful.

Before starting ESD for the first time, beginners should have some experience as the first assistant. With some cases, the main operator usually gives the beginners to do part of the ESD steps. This ESD is the first procedure of my young fellow.

Tele-mentoring using iPhone Facetime app is a very useful tool for ESD beginners. International mentoring is also possible. If you want some real-time comments from me, send me an e-mail (stomachlee@gmail.com).

Ladies and gentlemen, I’d like to conclude my presentation by saying that ESD is widely performed for EGCs in the absolute indication in Korea. Annually, it’s more than 7,000 cases. We are still very careful about expanded indication cases. It’s done usually for flat SRCs less than 1 cm. Starting the role of the first assistant is the beginning of learning ESD techniques.

Thank you for your attention.