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Endoscopic submucosal dissection for early gastric cancer: Quo vadis?

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Received: June 29, 2010 Revised: September 2, 2010

Accepted: September 9, 2010

Published online: June 7, 2011

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Cho WY, Cho JY, Chung IK, Kim JI, Jang JS, Kim JH. Endoscopic submucosal dissection for early gastric cancer: Quo vadis? *World J Gastroenterol* 2011; 17(21): 2623-2625 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v17/i21/2623.htm> DOI: <http://dx.doi.org/10.3748/wjg.v17.i21.2623>

INTRODUCTION

Gastrointestinal cancers represent the leading cause of cancer-related death worldwide. Prevalence and mortality rate of gastric cancer in malignant tumors is high in Asia, especially Korea and Japan. The diagnosis of early gastric cancer (EGC) is therefore of great interest because its endoscopic and surgical treatment presents the best chance for a cure. Advances in image-enhanced endoscopy allow improved visualization of lesions and can be used to gain insight into the pathology of the lesion, which, in turn, provides guidance to select the optimal treatment^[1].

CURRENT STATUS OF ENDOSCOPIC SUBMUCOSAL DISSECTION IN KOREA

Prevalence of EGC is increased due to nationwide mass screening for gastric cancer in Korea, and patients have the opportunity to be treated with curative resection of the tumor by endoscopic therapy. This allows the patients to retain their organs and maintain their quality of life without surgical complications. Endoscopic mucosal resection (EMR) was performed in small-sized, differentiated mucosal EGC. But large scale surgical data reported the possibility of an increased indication of endoscopic resection, and technical and instrumental development enabled endoscopic submucosal dissection (ESD).

Since the early nineties, EMR has been performed as

Abstract

The diagnosis of early gastric cancer (EGC) is of great interest because its endoscopic and surgical treatment presents the best chance for a cure. With technical development, endoscopic submucosal dissection (ESD) has been widely performed for the curative treatment of EGC in Korea. Multinational studies of ESD for EGC will be the next missions that overcome these limitations and global guidelines will be processed for ESD for EGC.

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Key words: Endoscopic submucosal dissection; Early gastric cancer

Peer reviewer: Dr. Dinesh Vyas, Department of Minimally and

a treatment modality of gastric neoplasia and ESD was first performed in Korea in 1999, with endoscopists performing ESD gradually. The Korean Society of Gastrointestinal Endoscopy (KSGE) organized an ESD research group in 2003 to discuss, investigate and spread ESD nationwide. Before 2006, only 22 hospitals had ESD facilities. The KSGE planned to hold a six session nationwide lecturing tour, with ESD hands-on courses to introduce the ESD procedure and devices with animal models. After that, the numbers strikingly increased in 2007, and the number of registered ESD facilities rose to 77 according to data from National Health Insurance Review & Assessment Service in 2008. Also, an annual international ESD live demonstration, *via* a telemedicine network, has been held since 2006, with more than a thousand endoscopists registered as audiences each year^[2].

TROUBLESHOOTING THE LIMITATION OF ESD

Therapeutic and long-term outcomes of ESD for EGC were acceptable with absolute and expanded indications^[3-6]. This revealed that, as described above, that ESD is a powerful technique with therapeutic efficacy for patients with EGC, which enables preservation of organs, increases the quality of life, and allows the complete removal of the primary tumor as an *en bloc* resection with a cancer cell-negative lateral and vertical margin regardless of the tumor location^[7-9]. But, ESD has its limitations in that (1) it also cause additional gastrectomy if the depth of invasion is deeper than the SM2 layer, and (2) local resection can be less accurate at evaluating the exact status of lymphovascular invasion and lymph node metastasis than surgery. Current staging workup with endoscopic ultrasound, CT scan and PET-CT is also limited in its correct diagnosis of EGC^[10-15]. Furthermore, gastric cancer generally shows greater histologic diversity than other types of cancer. Even tumors confined to the mucosa show histologic diversity, which tends to increase with deeper invasion and increased tumor diameter^[16-19]. For these characteristics, additional gastrectomy was performed after pathologic mapping results of the ESD specimen revealed the possibility of lymph node metastasis. Endoscopists, surgeons and radiologists should discuss and overcome these situations to appropriate treatment for patients with EGC.

In Korea, the National Evidence-based Health Care Collaborating Agency and the KSGE have plans for prospective studies into the short term and long term clinical outcomes of EGC treated by ESD. More than eleven tertiary university-affiliated hospitals will be involved in this study. This will be the key to establishing when endoscopic treatment of EGC should be used.

EGC with potential node metastasis might also be treated by a laparoscopic lymph node dissection without a gastrectomy after ESD. Abe *et al.*^[20] previously demonstrated that this combination enabled the complete endoscopic resection of the primary tumor and histo-

logic determination of lymph node status. However, remnant cancer cells in lymphatic and/or venous vessels in the gastric wall could potentially cause a cancer recurrence. Natural Orifice Transluminal Endoscopic Surgery (NOTES) has been applied to treat EGC with several case reports^[21-25]. In Korea, Endoscopic Full-Thickness Gastric Resection (EFTGR) with laparoscopic lymph node dissection with hybrid NOTES has been performed and the data was reported to the NOSCART conference in Boston, 2009. This consisted of five procedures; (1) marking around the lesion safety margin; (2) applying the ESD technique; a circumferential incision as deep as the submucosal layer was made around the lesion; (3) circumferential endoscopic full-thickness resection around the lesion through the submucosal incision line under laparoscopic guidance; (4) laparoscopic full-thickness resection around the remaining lesion through the EFTGR incision line inside the peritoneal cavity; and (5) laparoscopic closure of the resection margin. NOTES enables minimal tumor resection using the ESD technique, and a laparoscopic lymphadenectomy can be performed simultaneously during EGC, although there is a risk of lymph node metastasis. This procedure may be the bridge between ESD and gastric surgery^[26].

CONCLUSION

In summary, ESD has become one of the mainstream methods for the treatment of EGC. Although long-term clinical outcomes of previous reports are promising, there still seem to be many obstacles to overcome in order to progress and stabilize the therapeutic range of endoscopic therapy. Multinational, prospective studies of therapeutic outcomes and survivals will be the next target that will overcome these limitations and global guidelines will be processed for ESD for EGC.

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S- Editor Sun H L- Editor Rutherford A E- Editor Zheng XM