

Endoscopic Submucosal Dissection (E.S.D.) vs. Endoscopic Mucosal Resection (E.M.R.) in Colombia Advocating for E.S.D.

John Ospina Nieto, MD, MSCC, MSCG, MSCED.¹

¹ Gastrointestinal Surgeon and Digestive Endoscopist.
Gastroenterology and Endoscopy Coordinator at
El Niño Cardiovascular Hospital of Cundinamarca
(Soacha) – UNESDI

Received: 12-04-10
Accepted: 26-05-10

The high incidence of gastric cancer in countries like Japan has led to an ongoing search for technological improvements for early diagnosis and minimally invasive treatment of lesions. It is clear that early diagnoses and timely treatments are related to better prognoses and higher survival rates (1, 2).

Similar technological developments have already made possible what was just a fantasy a few years back: performance of endoscopic resections of early gastric cancers with curability rates close to the “gold standard” of radical surgery with lymphadenectomy (3). Endoscopic minimally invasive treatment of early gastric cancer was developed after the low risk of invasion of lymph nodes had been established. This risk ranges between 0.0% and 0.3% for well-differentiated intramucosal lesions under 30 mm, is 0.4 % for well-differentiated intramucosal ulcerated lesions of any size, and in the worst case scenario can reach 3.1% for lymph node invasions when the upper submucosal layer (Sm 1) is compromised (11, 12). The development of endoscopic therapy accessories made endoscopic mucosal resection (EMR) and its variations possible. Those variations include resection with snare, handle and clip with dual channel endoscope (“strip biopsy”), endoscopic mucosal resection using a cap-fitted endoscope (EMRC), and endoscopic mucosal resection with ligation (EMRL). When performed with adequate indications, these were safe and effective procedures for treatment of small early cancers (Table 1). (1, 4, 5, 13-15) However, despite EMR's success in cases of small early lesions, endoscopically more complex cases in terms of size and depth still needed to be solved. This led to a search for improvements in technique to make extraction of lesions in a single piece possible (1, 6, 7). This was the starting point for development of endoscopic knives among which is the insulation-tipped diathermic knife (IT knife- Olympus). This knife makes it possible to not only perform wider resections, but also to perform deeper ones in a safe and controlled manner. Its use allows one piece resections in up to 98% of cases compared to the 76% of cases with the use of REM. In addition, to 93% of these resections have tumor free border and curability rates are close to 97.2 %. This is equivalent to surgical resections with lymph node dissection but with a much lower mortality rate, better patient quality of life, and shorter post-operative recuperation period (1, 7, 14).

Table 1. Indications for Endoscopic Mucosal Resection (EMR).

Indications for EMR.	
Raised lesions of less than 20 mm	Well differentiated tumors
Depressed lesions of less than 10 mm	No ulceration

Although Japanese studies had demonstrated that there was a 3% chance of lymph node metastasis in mucosal lesions, the possibility of extracting them in one single piece was low with the technique used at the time (EMR). Consequently, piece-meal fragment type resections were performed on bigger lesions with well known consequences including neoplastic recurrence rates of up to 35% with EMR.

At that time one piece extraction became the ideal model for dissection of early gastrointestinal cancer. It lowers the risk of recurrence and makes it possible to evaluate and define compromised lateral and underlying edges depth section borders. It also allows us to evaluate and define lymph node and vascular compromises, both of which are important for predicting the curability of the treatment (1, 7-9, 12, 14).

Next, a better technique, Endoscopic Submucosal Dissection (ESD), was derived from the evolution of EMR. It made submucosal dissection of lesions possible, clearly establishing the advantages of ESD over EMR (14). These advantages include dissection of the submucosa under direct view and one piece resection of larger lesions. It also made it possible to broaden endoscopic resection criteria for early cancers (Table 2) (1, 7, 9).

Table 2. Indications for Endoscopic Submucosal Dissection (ESD).

Indications for ESD
Well or moderately-well differentiated adenocarcinoma
Non-ulcerated lesions of any size
Ulcerated lesions less than 30 mm
Invasion of Sm1 in lesions less than 30 mm
No signs of invasion of Sm2

A comparison of these two techniques is really a comparison of two stages of the evolution of one technique, with the ESD procedure clearly overcoming obstacles encountered with EMR. Different comparative studies have been done highlighting the advantages of ESD over EMR, even though ESD has a higher rate of hemorrhaging, greater risk of punctures, and requires longer time in surgery than does EMR (14). Table 3 summarizes some comparisons between these techniques. Among the points compared, ESD, but not EMR, provides the possibility of performing block resections regardless of the size of the lesion. Also, lower local recurrence with ESD must be highlighted (1, 7, 10, 12, 14).

Perhaps the biggest questions for some are whether or not performing ESD is viable in Latin America, especially in Colombia, and whether or not the resources for such procedures are available here.

Table 3. Comparing ESD to EMR.

	ESD	EMR
Procedure Time	Long	Short
Availability in Colombia	Yes	Yes
Block resection is possible in lesions larger than 15 mm	Yes	No
Useful in managing recurrence after endoscopic resection EMR	Yes	No
Easiness of post surgical evaluation of histopathological criteria	Very good	Medium
Recurrence in lesions larger than 15 mm	Very low	High
Complications (Hemorrhage and perforation)	ii	i
Indicated in broadened criteria for endoscopic resection	Yes	No
Indicated in diffuse type lesions of less than 10 mm	Yes	No
Learning Curve	Medium	Short

For me the answers to these questions are both clearly **Yes**. Among the obstacles to ESD has been the need for a longer learning curve than that for EMRs and the difficulty of acquiring endo-therapy accessories. These problems are progressively being solved with the sale the IT-Knife 2 (Olympus) (12) and hands-on workshops and courses. Several specialists in Colombia and in Latin America have been trained in this technique and have taught the procedure to others for the benefit of more patients. This has been done cautiously, according to strict educational stages beginning with improvement of performance in diagnosing early lesions. The next steps are learning to use the technique on animal cadavers, practicing the technique in live animals, and finally performing it on human patients.

Finally, the answer to the great question about costs clearly favors ESD. Even though the accessories needed to perform the procedure are about three times more expensive than the ones used for EMR, they are also about three to five times less expensive than the cost of a gastrectomy. In addition ESD has clear advantages in endoscopic management related to quality of life, shorter hospital stays, and lower mortality rates, but has the same survival results as surgical management. This, as mentioned before, is the gold standard for dealing with early gastric cancer which all techniques have to be compared (1, 3-5).

To conclude, ESD is a reality that has come to stay. It leaves some small room for EMR, a technique that has been abandoned in big institutions and Japanese groups but which is not likely to disappear in our environment. However, use of EMR will be limited to well differentiated, elevated lesions of less than 15 mm. Endoscopic submucosal dissection has become then the ideal endoscopic

method of handling early gastrointestinal lesions. Although it requires a wider and more conscientious learning curve, it is clearly a safe and effective technique in expert hands. It offers great advantages over EMR. It is also a proven technique that has yielded very good results in our country.

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