



# Evaluation of local recurrence in endoscopic submucosal dissection and endoscopic mucosal resection: a Western perspective

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## BACKGROUND & AIM

- There are currently two main endoscopic techniques for removal of large nonpedunculated polyps in the colon: endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD).<sup>1</sup>
- While EMR is an effective technique for removing polyps, larger polyps often require piecemeal resection, which can increase recurrence rates.
- ESD offers the ability for *en bloc* resection and as such is an attractive option for large lesions.<sup>2</sup>
- While ESD has been well-described in Asian studies, the ESD versus EMR experience in the West has not been well described.<sup>1,3</sup>
- In this study we hope to evaluate factors affecting recurrence after complex polypectomy by ESD and EMR.

## METHODS

- The study is a retrospective comparison of EMR and ESD procedures in patients referred to two endoscopists at Stanford University Medical Center between January 1, 2016 and December 31, 2019.
- Inclusion criteria were patients  $\geq 18$  years of age presenting for colonoscopy with polyps  $\geq 1$  cm removed by either EMR or ESD.
- Exclusion criteria were patients in whom polyp resection was not performed for reasons such as suspected advanced cancer.
- Data collected included patient demographics, polyp size and location, method of polyp resection, use of clips and other accessories, pathology, 30-day complications, and follow-up evaluations.
- The primary outcome measured was recurrence on follow-up.

## RESULTS

**Table 1. Patient characteristics by intervention**

	ESD (N=90)	EMR (N=258)
Mean Age ( $\pm$ SD)	63.3 (12.9)	64.4 (11.6)
Male (%)	34 (37.8)	84 (32.6)
Race/Ethnicity		
White, N(%)	51 (56.7)	145 (56.2)
Asian, N(%)	19 (21.1)	27 (10.4)
African American, N(%)	3 (3.3)	11 (4.3)
Hispanic, N(%)	11 (12.2)	37 (14.3)
Other, N(%)	6 (6.7)	35 (13.6)
Sedation		
Moderate sedation, N(%)	18 (20.0)	77 (29.8)
Monitored anesthesia care, N(%)	66 (73.3)	172 (66.7)
General anesthesia, N(%)	6 (6.7)	9 (3.5)
Adequate bowel preparation, N(%)	87 (96.7)	249 (96.5)
Location of polyp		
Extension into Ileum, N(%)	0 (0.0)	3 (1.2)
Cecum, N(%)	16 (17.8)	61 (23.6)
Ascending, N(%)	19 (21.1)	90 (34.9)
Transverse, N(%)	9 (10.0)	54 (20.9)
Descending, N (%)	3 (3.3)	19 (7.4)
Sigmoid, N(%)	8 (8.9)	15 (5.8)
Rectum, N(%)	35 (38.9)	16 (6.2)
Mean size of polyp, mm ( $\pm$ SD)	33.3 (16.3)	23.9 (12.4)
Pathology		
Nonneoplastic, N(%)	1 (1.1)	20 (7.8)
Neoplastic, no high grade dysplasia, N(%)	56 (62.2)	218 (84.5)
High grade dysplasia, N(%)	19 (21.1)	10 (3.9)
Adenocarcinoma, N(%)	11 (12.2)	10 (3.9)
Neuroendocrine tumor, N(%)	3 (3.3)	0 (0.0)
Follow-up, N(%)	47 (52.2)	120 (46.5)
Follow-up time, days (SD)	282.6 (138.0)	416.8 (251.2)
Recurrence on follow-up, N(%)	0 (0.0)	13 (10.8)
Adverse Events		
Perforation, N(%)	2 (2.2)	0 (0.0)

## FUNDING

- None to disclose

- A total of 348 patients were included, 258 of whom received EMR and 90 of whom received ESD. Follow-up was available in 167 patients (48.0%).
- The patients in the EMR and ESD cohorts had similar distribution in age, sex, race/ethnicity, sedation used, and adequacy of bowel preparation (**Table 1**).
- Compared to EMR, ESD had higher proportion of polyps removed in the rectum (38.9 vs 6.2%). Polyps removed by ESD were significantly larger than by EMR (33.3 vs 23.9mm,  $p < 0.0001$ ).
- ESD removed a higher proportion of adenocarcinoma (12.2 vs 3.9%) and high grade dysplasia (21.1 vs 3.9%) compared to EMR.
- There was similar proportion of patients in both cohorts that received follow-up endoscopy (52.2 vs 46.5%).
- While there was no recurrence on follow-up for the ESD cohort, polyps removed by EMR had 10.8% recurrence ( $p = 0.019$ ).
- There were no perforations in the EMR group.
- In the ESD cohort there was 2 cases of delayed perforation (2.2%); both required surgery.
- On univariate analysis (**Table 2**) evaluating factors affecting recurrence, *en bloc* resection was found to decrease odds of recurrence (Odds ratio 0.11, 95% CI: 0.01-0.59).
- The remaining variables including age, sex, race/ethnicity, polyp size, location, and pathology did not achieve statistical significance.

**Table 2. Univariate analysis of recurrence at follow-up evaluation**

	Odds Ratio (95% CI)	p-value
Age	1.01 (0.95-1.07)	0.776
Male	1.35 (0.42-4.26)	0.604
Race/ethnicity		
White	0.30 (0.08-0.96)	0.052
Asian	1.68 (0.36-6.01)	0.455
African American	1.73 (0.09-10.91)	0.623
Hispanic	2.23 (0.47-8.14)	0.254
Other	1.94 (0.28-8.31)	0.418
Polyp Size	0.99 (0.95-1.03)	0.656
En bloc resection	0.11 (0.01-0.59)	<b>0.037</b>
Location		
Cecum	2.17 (0.62-6.94)	0.199
Ascending	0.43 (0.07-1.69)	0.288
Transverse	0.59 (0.09-2.31)	0.500
Descending	4.42 (0.60-22.03)	0.089
Rectum	0.97 (0.14-3.91)	0.969
Pathology		
Neoplastic, no high grade dysplasia	1.83 (0.47-12.19)	0.444
HGD	1.44 (0.22-5.99)	0.650

## CONCLUSIONS

- In our study, there were no recurrences on ESD, while EMR had a 10.8% recurrence.
- *En bloc* resection was found to significantly decrease risk of recurrence following resection.
- While further studies are needed to investigate ESD and EMR, we have demonstrated the efficacy of ESD in a Western population.

## WORKS CITED

1. Komeda Y, Watanabe T, Sakurai T, et al. Risk factors for local recurrence and appropriate surveillance interval after endoscopic resection. *World J Gastroenterol*. Mar 2019;25(12):1502-1512. doi:10.3748/wjg.v25.i12.1502
2. Harlow C, Sivananthan A, Ayaru L, Patel K, Darzi A, Patel N. Endoscopic submucosal dissection: an update on tools and accessories. *Ther Adv Gastrointest Endosc*. 2020 Jan-Dec 2020;13:2631774520957220. doi:10.1177/2631774520957220
3. Holmes I, Friedland S. Endoscopic Mucosal Resection versus Endoscopic Submucosal Dissection for Large Polyps: A Western Colonoscopist's View. *Clin Endosc*. Sep 2016;49(5):454-456. doi:10.5946/ce.2016.077