

Supplementary material

Supplementary Table 1 Data from studies evaluating the efficacy and safety of other EMR modifications (cap-assisted EMR, tip-in EMR, EMR precutting, EMR band ligation)

Studies evaluating the efficacy and safety of cap-assisted EMR													
Author [Ref], year	Country	Study design	Study period	No. of centers	No. of endoscopists	No. of patients	No. of polyps	Polyp size (mm)	Complete resection rate (%)	<i>En bloc</i> resection rate (%)	Recurrent/residual polyps (%)	Total resection time*	Adverse event rate (%)
Conio <i>et al</i> [48], 2010	Italy	Dual-center, prospective	01/2000-12/2007	2	NR	255	282 (146 SSPs, 135 LSTs)	25 for SSPs, 30 for LSTs	NR	0.0	4.0	40 min	8.6
Kashani <i>et al</i> [49], 2016	United States	Single-center, retrospective	06/2009-10/2013	1	1	97	124	NR	91.0	NR	NR	NR	10.2
Conio <i>et al</i> [50], 2010	Italy	Dual-center, Case series	01/2006-07/2008	1	NR	7	7	40	NR	NR	0.0	50min	28.5
Lew <i>et al</i> [51], 2019	United States	Single-center, retrospective	07/2008-11/2018	1	1	21	21	15	100.0	33.3	33.3	NR	24.0
Studies evaluating the efficacy and safety of Tip-in EMR													
Author [Ref], year	Country	Study design	Study period	No. of centers	No. of endoscopists	No. of patients	No. of polyps	Polyp size (mm)	Complete resection rate (%)	<i>En bloc</i> resection rate (%)	Recurrent/residual polyps (%)	Total resection time*	Adverse event rate (%)
Pioche <i>et al</i> [53], 2019	France	Multi-center, retrospective	05/2017-01/2018	4	10	125	141	19.8	70.2	84.6	NR	NR	4.0
Imai <i>et al</i> [54], 2020	Japan	Single-center, retrospective	03/2014-12/2016	1	NR	72	78	NR	NR	85.9	0.0	NR	1.3
Lee <i>et al</i> [55], 2019	Taiwan	Single-center, retrospective	09/2015-09/2017	1	1	42	46	20.4	NR	100.0	5.0	14.9 min	2.2
Sato <i>et al</i> [52], 2020†	Japan	Single-center, retrospective	01/2010-01/2019	1	6	Tip-in vs. C-EMR 43 vs. 83	Tip-in vs. C-EMR 43 vs. 83	Tip-in vs. C-EMR 22.9 vs. 24.3	Tip-in vs. C-EMR 76.3 vs. 54.1	Tip-in vs. C-EMR 90.7 vs. 69.8	Tip-in vs. C-EMR 0.0 vs. 7.0	Tip-in vs. C-EMR 6.64 min vs. 10.4 min	Tip-in vs. C-EMR 46 vs. 3.6
Noh <i>et al</i> [56], 2020†	Korea	Single-center, retrospective	01/2018-09/2018	1	1	Tip-in vs. C-EMR 27 vs. 53	Tip-in vs. C-EMR 38 vs. 74	Tip-in vs. C-EMR 13.2 vs. 13.2	Tip-in vs. C-EMR 76.3 vs. 54.1	Tip-in vs. C-EMR 94.7 vs. 77	NR	Tip-in vs. C-EMR 178 sec vs. 149 sec	Tip-in vs. C-EMR 11.1 vs. 0.0

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Supplementary Table 1 (Continued)

Studies evaluating the efficacy and safety of EMR precutting

Lee <i>et al</i> [58], 2012	Korea	Single-center, retrospective	01/2004 11/2009	1	3	69	699	28.9	59.4	65.2	3.1	NR	15.9
Sakamoto <i>et al</i> [59], 2012	Japan	Single-center, retrospective	03/2008 07/2009	1	2	24	24	20.9	NR	67.0	0.0	40.0	0.0
Terasaki <i>et al</i> [60] 2012	Korea	Single-center, retrospective	04/2006 12/2009	1	2	28	28	20.9	NR	NR	0.0	NR	NR
Cheddy <i>et al</i> [61] 2012	UK	Single-center, prospective	2007 2014	1	NR	37	37	40.0	NR	38.0	16.0	NR	8.0
Bhattacharyya <i>et al</i> [62], 2012	UK	Single-center, prospective	2007 2013	1	1	170	348	46.0	NR	41.0	13.1	150	8.2
Yoshida <i>et al</i> [63], 2019	Japan	Multicenter, retrospective	04/2011 05/2018	3	NR	EMR precutting P vs. C-EMR 98 vs. 98	EMR precutting vs. C-EMR 98 vs. 98	EMR precutting vs. C-EMR 14.1 vs. 13.9	EMR precutting vs. C-EMR 87.8 vs. 67.3	EMR precutting vs. C-EMR 98.0 vs. 85.7	NR	EMR precutting vs. C-EMR 11.8 vs. 2.8	EMR precutting vs. C-EMR 1.0 vs. 1.0
Kim <i>et al</i> [64], 2013	Korea	Single-center, retrospective	03/2007 03/2011	1	3	91	91	20.9	51.6	61.5	0.0	30.0	6.5
Jung <i>et al</i> [65], 2018	Korea	Multicenter, prospective	01/2012 12/2013	5	NR	39	39	25.0	92.3	51.3	NR	26.8	12.8

Meta-analyses evaluating the efficacy and safety of EMR precutting

Method	No. of studies included	Study design	No. of patients	Complete resection rate	<i>En bloc</i> resection rate	Recurrent/residual polyp rate	Adverse event rate	Other outcomes
Fuccio <i>et al</i> [66], 2017	12	3 prospective; 9 retrospective	694	Pooled rate: 60.6%, 95%CI 40.6-77.5	Pooled rate: 68.4%, 95%CI 51.7-81.3	Pooled rate 2.0%, 95%CI 0.7-5.6 at 12 months	Pooled rate 4.0%, 95%CI 2.8-5.8 for delayed bleeding	Higher R0 and <i>en bloc</i> resection rates in Asian countries

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Supplementary Table 1 (Continued)

Studies evaluating the efficacy and safety of EMR with band ligation

Author [Ref], year	Country	Study design	Study period	No. of centers	No. of endoscopists	No. of patients	No. of polyps	Polyp size (mm)	Complete resection rate (%)	En bloc resection rate (%)	Recurrent/residual polyps (%)	Total resection time*	Adverse event rate (%)
Ono <i>et al</i> [70], 2003	Japan	Single-center, prospective	01/1999 01/2002	1	NR	28	ESMR-L vs. C-EMR 14 vs.14	ESMR-L vs. C-EMR 7.3 vs.6.9	ESMR-L vs. C-EMR 100 vs.57	NR	ESMR-L vs. C-EMR 0.0 vs.0.0	NR	NR
Ebi <i>et al</i> [72], 2018	Japan	Dual-center, prospective	05/2003 06/2002	2	NR	33	ESMR-L vs. C-EMR 19 vs.14	ESMR-L vs. C-EMR 5.0 vs.6.9	ESMR-L vs. C-EMR 89.5 vs.50	ESMR-L vs. C-EMR 100 vs.100	ESMR-L vs. C-EMR 0.0 vs.0.0	ESMR-L vs. C-EMR 6min vs.6.5min	ESMR-L vs. C-EMR 0.0 vs.0.0
Kim <i>et al</i> [73], 2011	Korea	Multicenter, retrospective	01/2004 12/2010	4	NR	100	ESMR-L vs. C-EMR 45 vs.55	ESMR-L vs. C-EMR 5.9 vs.6.3	ESMR-L vs. C-EMR 100 vs.91	ESMR-L vs. C-EMR 93.3 vs.65.5	NR	ESMR-L vs. C-EMR 4.8min vs.5min	ESMR-L vs. C-EMR 4.4 vs.0.0
Lee <i>et al</i> [74], 2020	Korea	Single-center, retrospective	11/2011 07/2009	1	NR	139	ESMR-L vs. C-EMR 29 vs.110	ESMR-L vs. C-EMR 7.7 vs.6.8	ESMR-L vs. C-EMR 93.1 vs.74.5	ESMR-L vs. C-EMR 100 vs.94.5	NR	ESMR-L vs. C-EMR 10.7min vs.7.7min	ESMR-L vs. C-EMR 0.0 vs.0.0
Choi <i>et al</i> [76], 2013	Korea	Single-center, prospective	2008 2011	1	2	60	EMR-L vs. ESD 29 vs. 31	EMR-L vs. ESD 4.3 vs. 5.2	EMR-L vs. ESD 82.8 vs. 80.6	NR	NR	ESMR-L vs. C-EMR 6.3min vs.15.5min	ESMR-L vs. C-EMR 0.0 vs.3.2
Bang <i>et al</i> [78], 2016	Korea	Single-center, prospective	01/2012 02/2016	1	4	77	EMR-L vs. ESD 53 vs. 24	EMR-L vs. ESD 4.6 vs. 5.2	EMR-L vs. ESD 100 vs. 54.2	EMR-L vs. ESD 100 vs. 100	EMR-L vs. ESD 0.0 vs. 4.2	EMR-L vs. ESD 5.3min vs. 17.9 min	EMR-L vs. ESD 0.0 vs. 0.0
Lim <i>et al</i> [77], 2019	Korea	Single-center, retrospective	01/2011 12/2012	1	2	82	EMR-L vs. ESD 66 vs. 16	EMR-L vs. ESD 5.2 vs. 7.8	EMR-L vs. ESD 100 vs. 100	EMR-L vs. ESD 95.5 vs. 75	EMR-L vs. ESD 0.0 vs. 0.0	EMR-L vs. ESD 7.1min vs. 24.2 min	EMR-L vs. ESD 0.0 vs. 0.0

Meta-analysis comparing the effect of EMR with band ligation vs. ESD for rectal neuroendocrine tumors

Author, [Ref], year	Method vs. comparator	No. of studies included	Study design	No. of patients	Complete resection rate	En bloc resection rate	Recurrent/residual polyp rate	Adverse event rate	Resection Time
Pan <i>et al</i> [79], 2018	EMR-L vs. ESD	14	2 prospective; 12 retrospective	823	OR 4.08, 95%CI 1.42-6.88	NR	OR 0.76, 95%CI 0.11-5.07	OR 0.56, 95%CI 0.28-1.14	MD -1.59, 95%CI -2.27 to -0.90

f statistically significant *; standard deviation or interquartile range; NR, not reported; †; study comparing outcomes of tip-in EMR vs. C-EMR; ‡; study comparing outcomes of EMR precutting vs. C-EMR; §; study comparing outcomes of EMR with ligation (EMR-L) vs. endoscopic submucosal dissection (ESD) for small (<=10 mm) rectal neuroendocrine tumors; OR, odds ratio; RR, relative risk; MD, mean difference; 95%CI, 95% confidence intervals

C-EMR, Conventional endoscopic mucosal resection; No., number