

How to Approach a Newly Diagnosed Hilar Stx

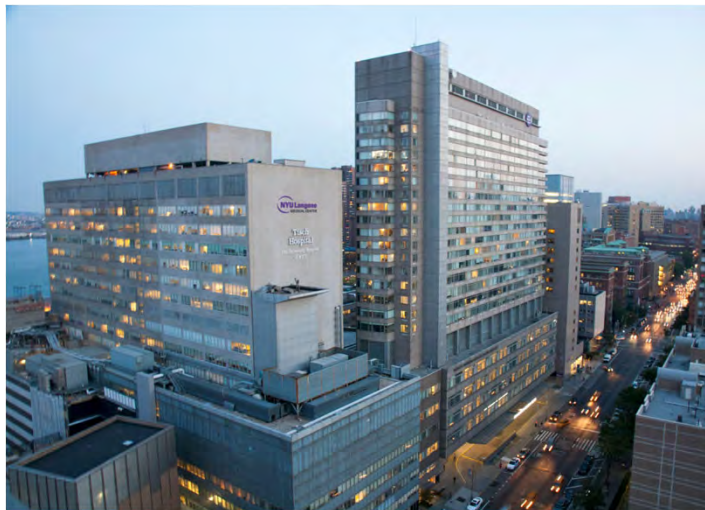
Gregory Haber MD

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Optimal Colon Polyp Resection

Gregory Haber MD

Professor of Medicine

NYU, New York



Beyond EMR....

- Why we should go beyond our EMR comfort zone
- When do we use forceps, cold snare, hot snare
- How to reduce the rate of residual/recurrent polyps
- When do we go underwater
- Tools to achieve complete resection for difficult polyps

Interval CRC

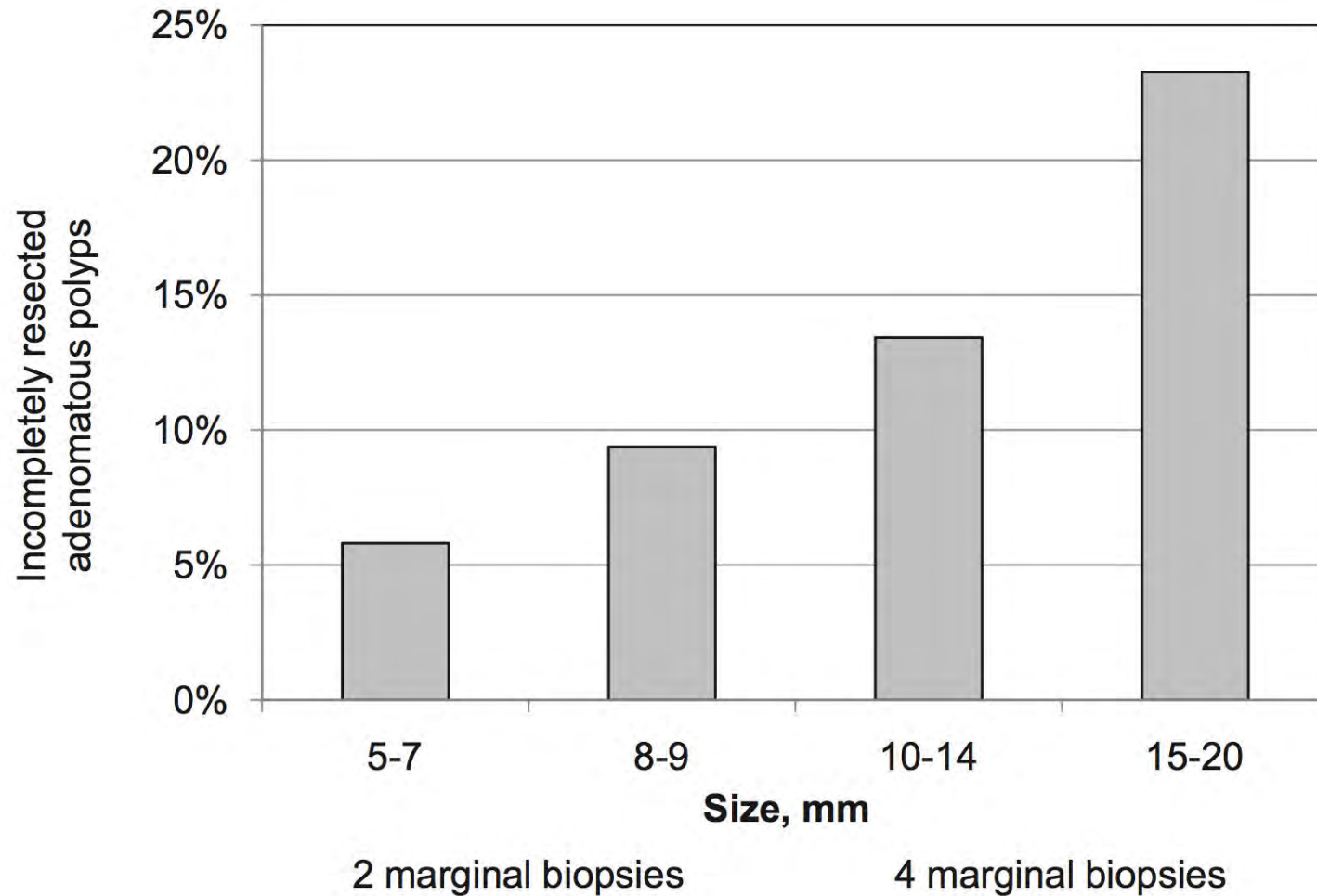
2659 CRC among 127,205 Colonoscopies from a Utah database covering 85% of the population

159 (6%) of pts were diagnosed with CRC within 6-60 months following colonoscopy

Endoscopy Review of 36 pts with Interval CRC

Polypectomy at same site as CRC	
No	15
Yes	17 (53.1)
Polypectomy at same or adjacent site as CRC	
No	4
Yes	28 (87.5)
Report of incomplete polypectomy	
No	20 (62.5)
Yes	12 (37.5)
Not applicable (no polyp found)	4
Polyp ≥ 10 mm	
No	20 (62.5)
Yes	12 (37.5)
Not applicable (no polyp found)	4
Polyp histology (n = 25)	
Hyperplastic polyp	8 (32)
Tubular adenoma	14 (56)
Tubulovillous adenoma	8 (32)
Adenoma with high-grade dysplasia	4 (16)
Type of polypectomy	
Not applicable (no polyp found)	4
Polyp not removed	2
Cold snare	3 (8.33)
Hot snare	13 (36.11)
Forceps	14 (38.9)

Polyp Characteristics and IRR



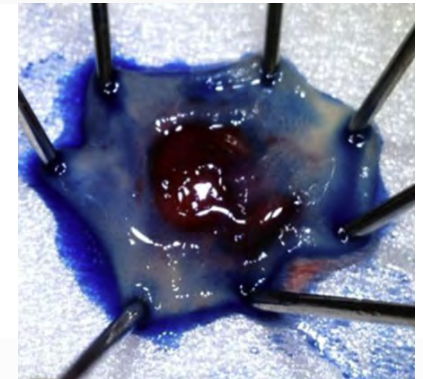
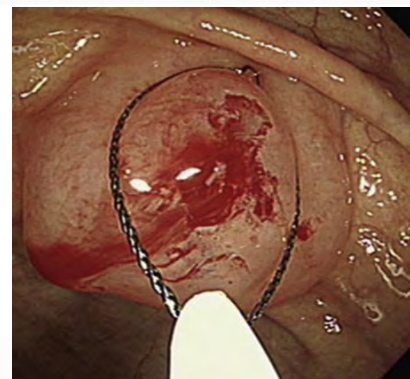
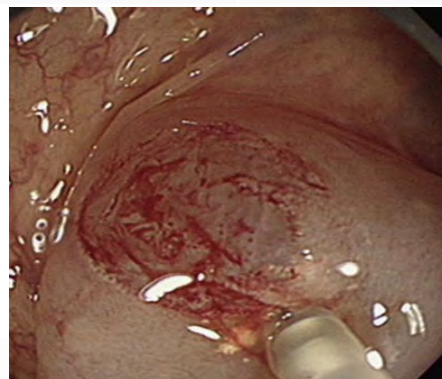
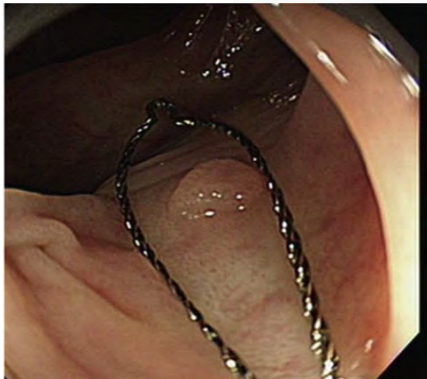
Cold snare polypectomy versus cold forceps polypectomy for diminutive and small colorectal polyps: a randomized controlled trial

Joon Sung Kim, MD,¹ Bo-In Lee, MD,² Hwang Choi, MD,¹ Sun-Young Jun, MD,³ Eun Su Park, MD,³ Jae Myung Park, MD,² In-Seok Lee, MD,² Byung-Wook Kim, MD,¹ Sang Woo Kim, MD,² Myung-Gyu Choi, MD²

Seoul, Korea

Polyp Base injected and snared with 1-2mm margin and sent for histology to assess for residual adenoma

Successful Removal	Cold Snare	Cold Forceps
Adenoma < 4mm	27/27 100%	31/32 96.9%
Adenoma 5-7mm	30/32 93.8%	26/37 70.3%** P=0.013



RCT Evaluation of Cold Snare or Jumbo Forceps vs Cold Forceps for Diminutive/Small Polyps

Study	Polyp n (%adenoma)	Cold Forceps vs	Risk Ratio for Incomplete Resection
Lee, 2013, Korea	117 (70%)	Cold Snare	0.28
Gomez, 2014, Fla	57 (60%)	Cold Snare	0.86
Kim, 2015, Korea	145 (88%)	Cold Snare	0.19
Park, 2016, Korea	231 (80%)	Cold Snare (NBI)	0.31 (>3mm)
Aslan, 2013, Turkey	276 (71%)	Jumbo Forceps	0.36
Draganov, 2014, Fla	305 (39%)	Jumbo Forceps	0.78

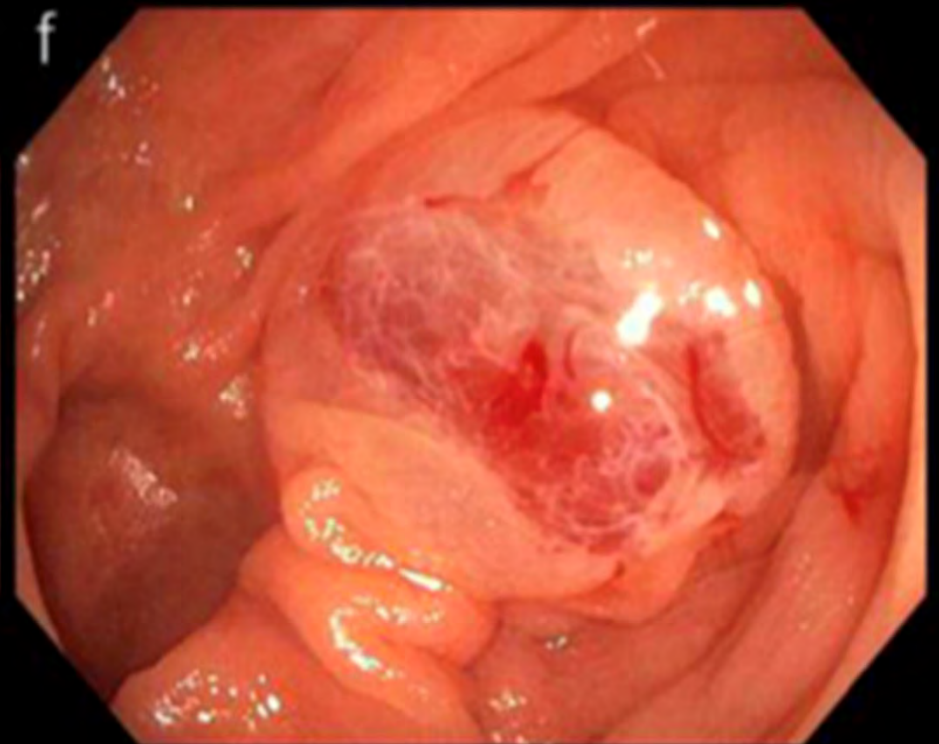
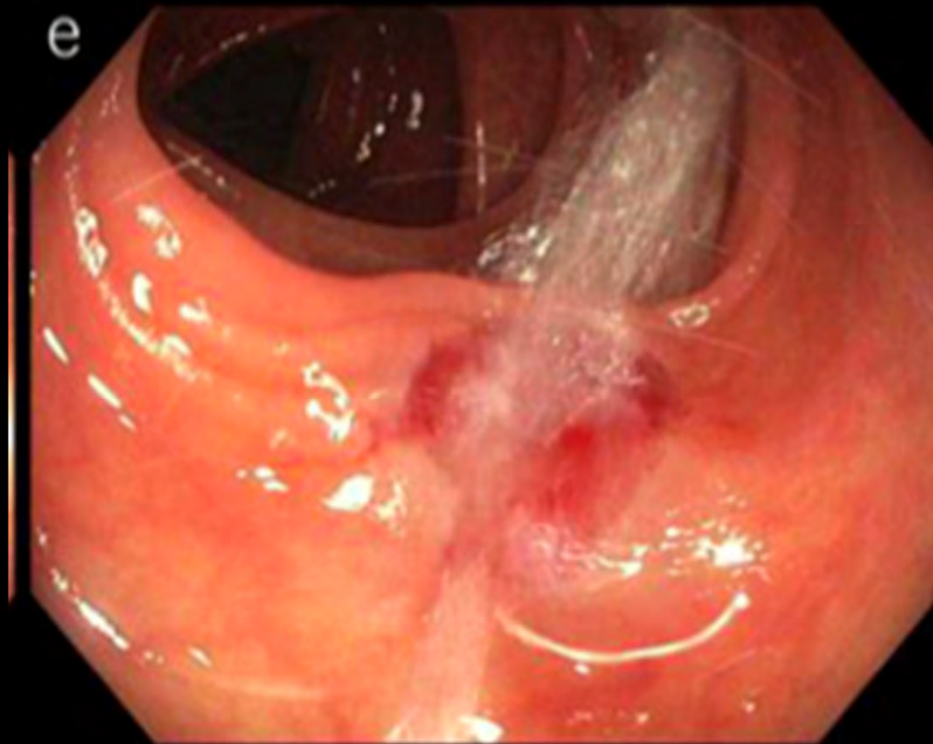
Randomized Controlled Trial Investigating Cold Snare and Forceps Polypectomy Among Small POLYPs in Rates of Complete Resection: The TINYPOLYP Trial

AJG, 2022

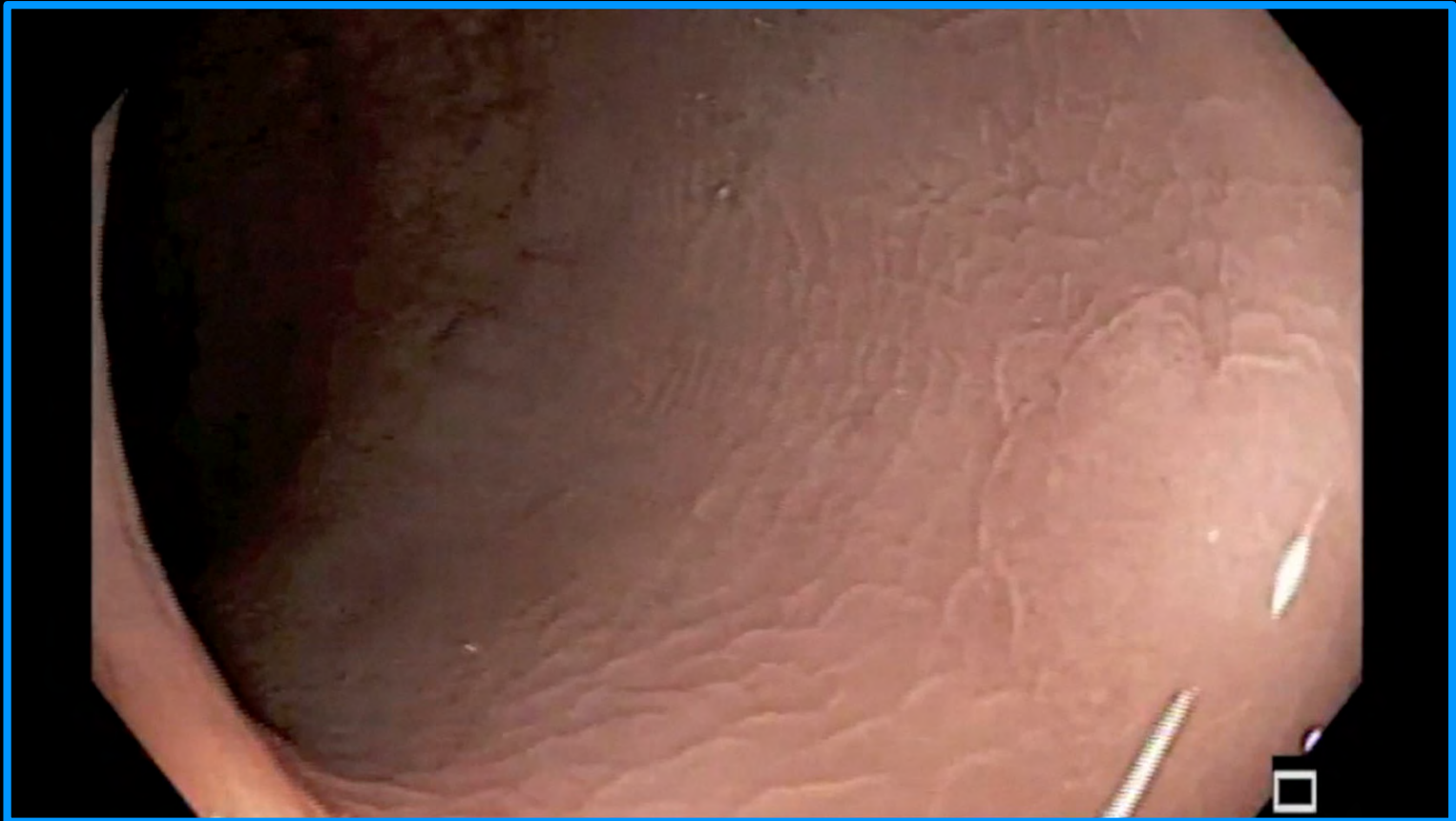
Mike T. Wei, MD, Christine Y. Louie, MD, Yu Chen, MD, Jennifer Y. Pan, MD, MS, Susan Y. Quan, MD, Robert Wong, MD, Ryanne Brown, MD, MBA, Melissa Clark, MD, Kristin Jensen, MD, Hubert Lau, MD and Shai Friedland, MD

- 279 polyps $\leq$ 3mm randomized Forceps vs Cold Snare
- Radial Jaw 4 vs Exacto
- 2 marginal biopsies after complete removal
- Complete Resection Rate Equal 98.3% Both Groups
- More than one piece CF 15.6% CS 3.6%
- Time CF 23.2 sec vs CS 42.3 sec

Water Jet Test

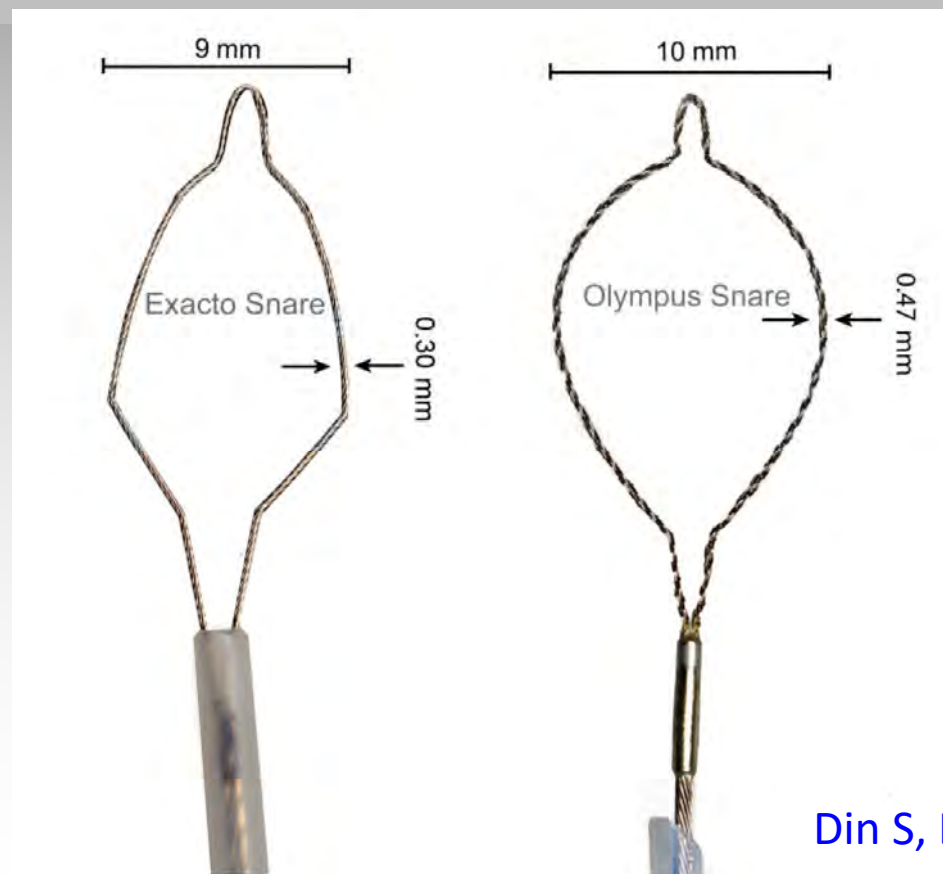


Cold Snare



Does Cold Snare Type Matter?

- A non randomized comparison of removal of 3-7mm polyps using 2 cold snares, comparing 56 pts (89 polyps) in the Exacto snare group with a second period with 56 pts (72 polyps) with Olympus oval snare



CSP ?Thin or Thick Wire

Horiuchi A, Hosoi K, Kajiya M, et al. Prospective, randomized comparison of 2 methods of cold snare polypectomy for small colorectal polyps. *Gastrointest Endosc* 2015;82:686–92.

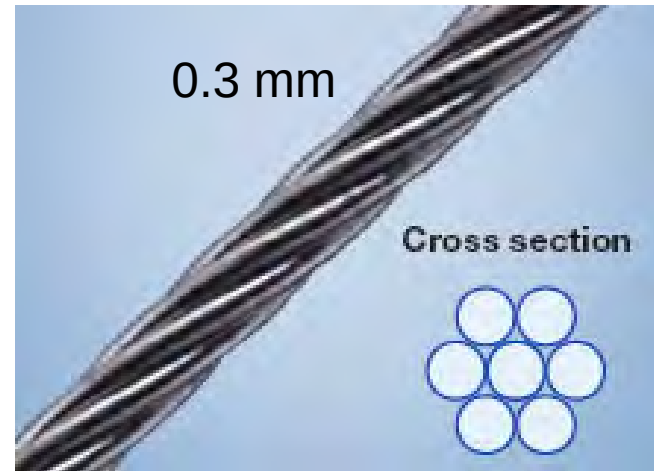
Din S, Ball AJ, Riley Sa, et al. Cold snare polypectomy: Does snare type influence outcomes? *Dig Endosc* 2015; 27:603–8.

- Thin wire superior in complete and en bloc resection

Hybrid Snares



Hot/Cold 6/10/20

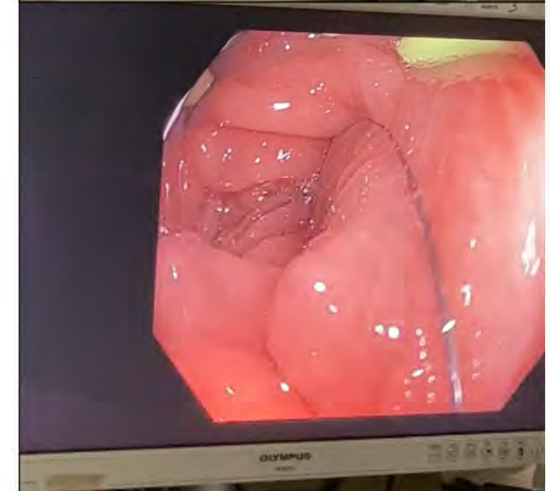
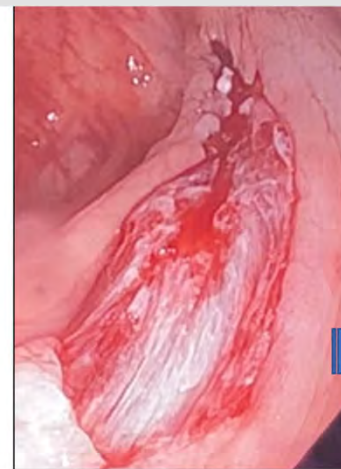
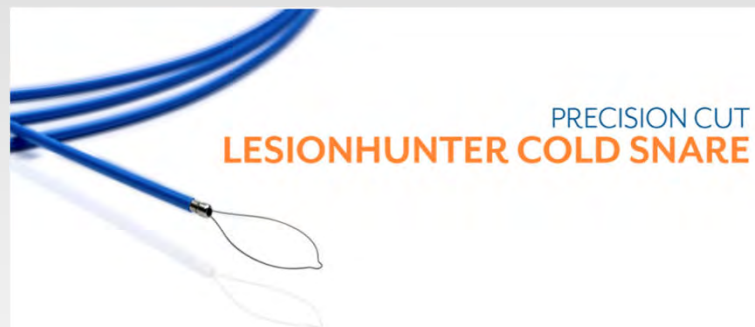


0.3 mm

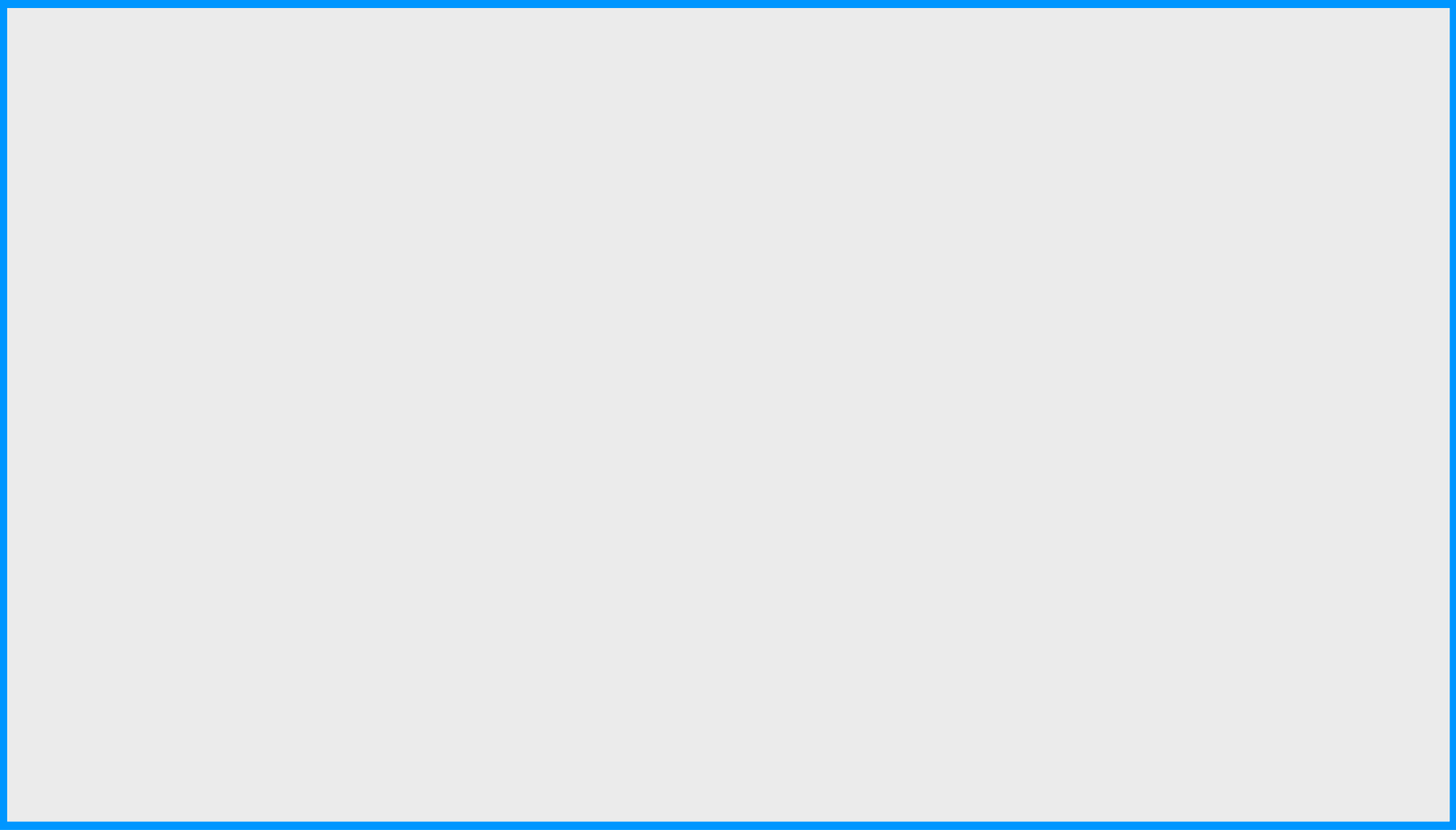
Cross section

Hot/Cold 10/15 mm



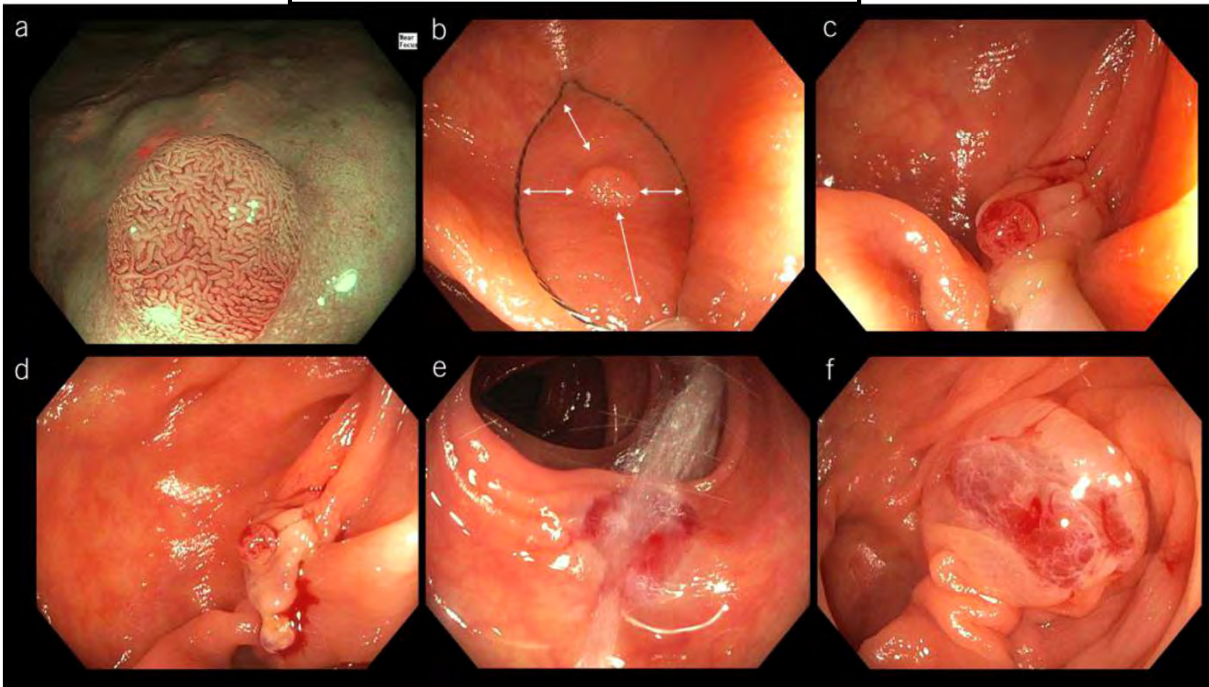
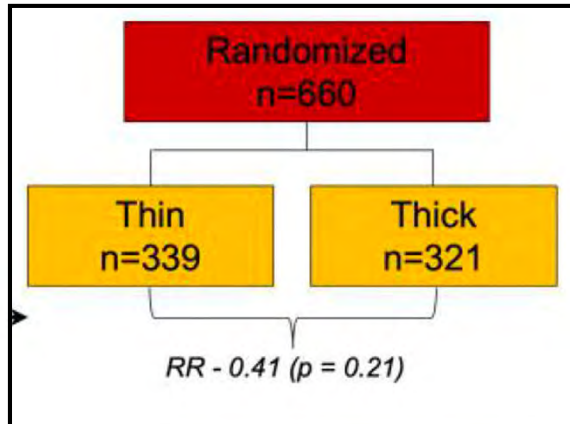


- 0.18mm wire (7 thousandths of an inch)
- Cuts through larger purchase of tissue
- Designed for larger cold resections above 1 cm
- 1:1 Rotation
- Nitinol wire keeps its shape
- Prevents tissue fly away after resection
- Sizes: 10mm, 15mm, and 20mm (*important to size the snare to the lift – not the lesion to obtain a healthy margin during resection*)



A Randomized Controlled Trial of Cold Snare Polypectomy Technique: Technique Matters More Than Snare Wire Diameter

Mayenaaz Sidhu, MBBS^{1-3,*}, Nauzer Forbes, MD, MSc^{4-6,*}, David J. Tate, CANTAB, PhD^{1,2,7,*}, Lobke Desomer, MD^{1,8},
Eric Y.T. Lee, MBBS¹⁻³, Nicholas Burgess, MBBS, PhD¹⁻³, Arnout van Hattem, MD, PhD¹, Duncan Mcleod, MBBS⁹, Edwin Cheng, MD⁵,
Shane Cartwright, BA⁶, Andrew Schell, MD¹⁰, Robert J. Hilsden, MD⁴⁻⁶, Steven J. Heitman, MD, MSc^{4-6,#} and Michael J. Bourke, MBBS^{1,2,#}

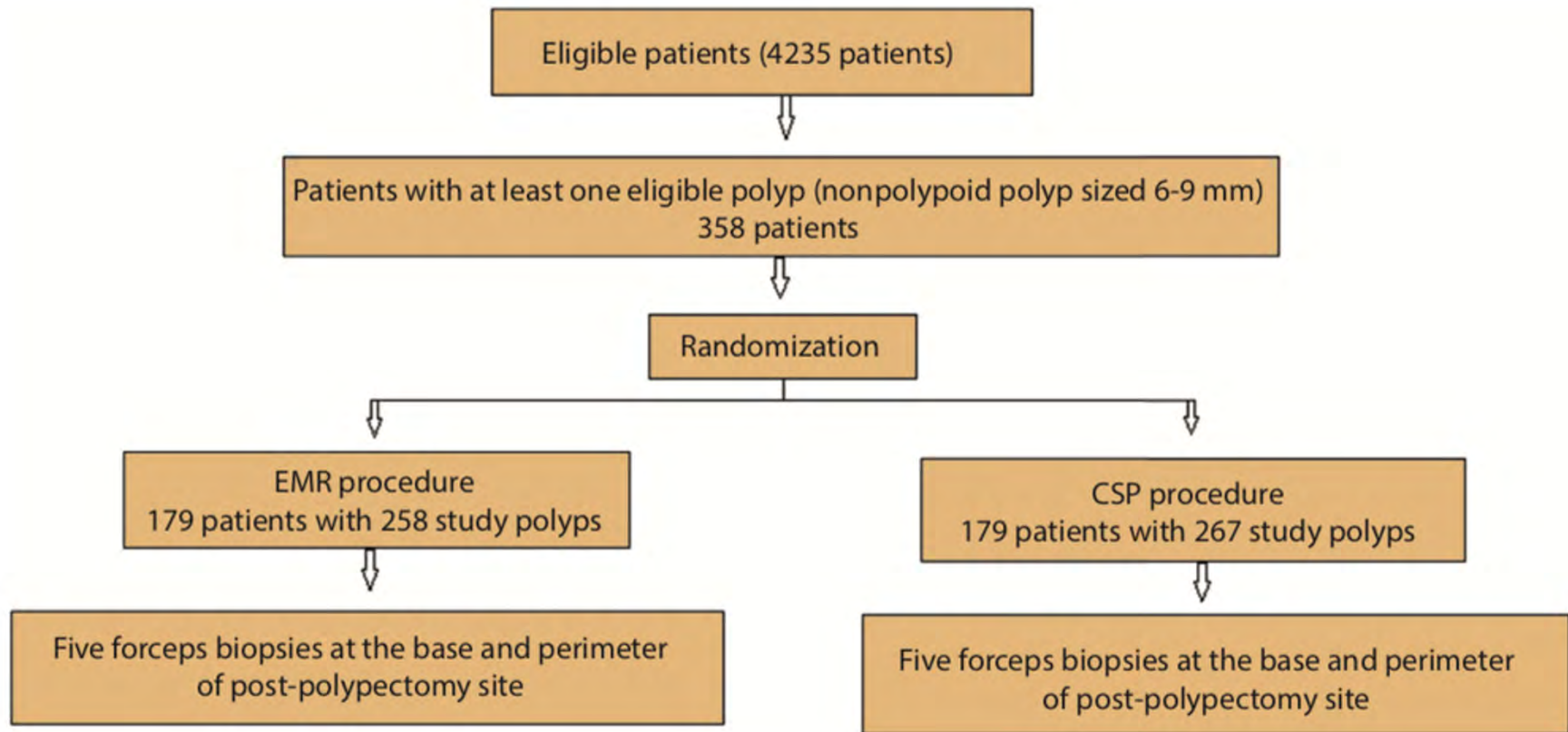


- Incomplete Resection Rate (2 marginal biopsies)
- Thin Wire 3/339
- Thick Wire 6/320

Caveats to be considered

- 660 Polyps randomized to Thin or Thick Wire
- 17 Endoscopists enrolled pts over 52 mos
- Each endoscopist enrolled 9 pts per year
- 28% of polyps were hyperplastic or normal
- Median polyp size was 4mm

EMR vs Cold Snare for Small Polyps



EMR vs Cold Snare for Small Polyps

En Bloc resection was significantly higher in the EMR vs CSP group 95.0% vs 87.6%

Incomplete Resection Rate was 1.5% for EMR vs 8.5% for CSP

Procedure time and Complication rates were not different

Efficacy and safety of cold vs hot snare polypectomy for small (5-9 mm) colorectal polyps: a multicenter randomized controlled trial

Endoscopy, 2020

Marina De Benito Sanz, Luis Hernández, M Isabel García-Martínez, Pilar Díez Redondo, Diana Joao Matías, Jesus M Gonzalez-Santiago, Mercedes I García, Henar Nuñez Rodríguez, Marta Cimavilla, Carla Tafur Sánchez, Laura Mata, Antonio Guardiola Arévalo, Jorge Feito, Francisco J García-Alonso.

- ◆ 496 subjects randomized: 237 (394 polyps) CSP and 259 (397 polyps) HSP
- ◆ Complete polypectomy rates : 92.5% CSP and 94% with HSP
- ◆ No Difference in immediate or delayed bleeding
- ◆ Abdominal pain 1 hr post procedure: 18.8% CSP vs 18.4% HSP
- ◆ Abdominal pain 5 hr post: 5.9% CSP vs 16.5% HSP (sig)
- ◆ 24 hr Asymptomatic: 97% CSP vs 86.4% HSP (sig)

No submucosal injection

Endoscopic mucosal resection for large serrated lesions in comparison with adenomas: a prospective multicentre study of 2000 lesions

Cumulative Recurrence Rates

Polyp>20mm	6 mos	12 mos	18 mos	24 mos
Adenoma n=1018	16.1%	20.4%	23.4%	28.4%
SSA/P n=190	6.3%	7%	7%	7%

Biopsies of scar in 684 of the 1208 pts in this study
Routine biopsy of normal appearing scar **not** performed

SCAR Study: RCT of Snare Tip Soft Coag

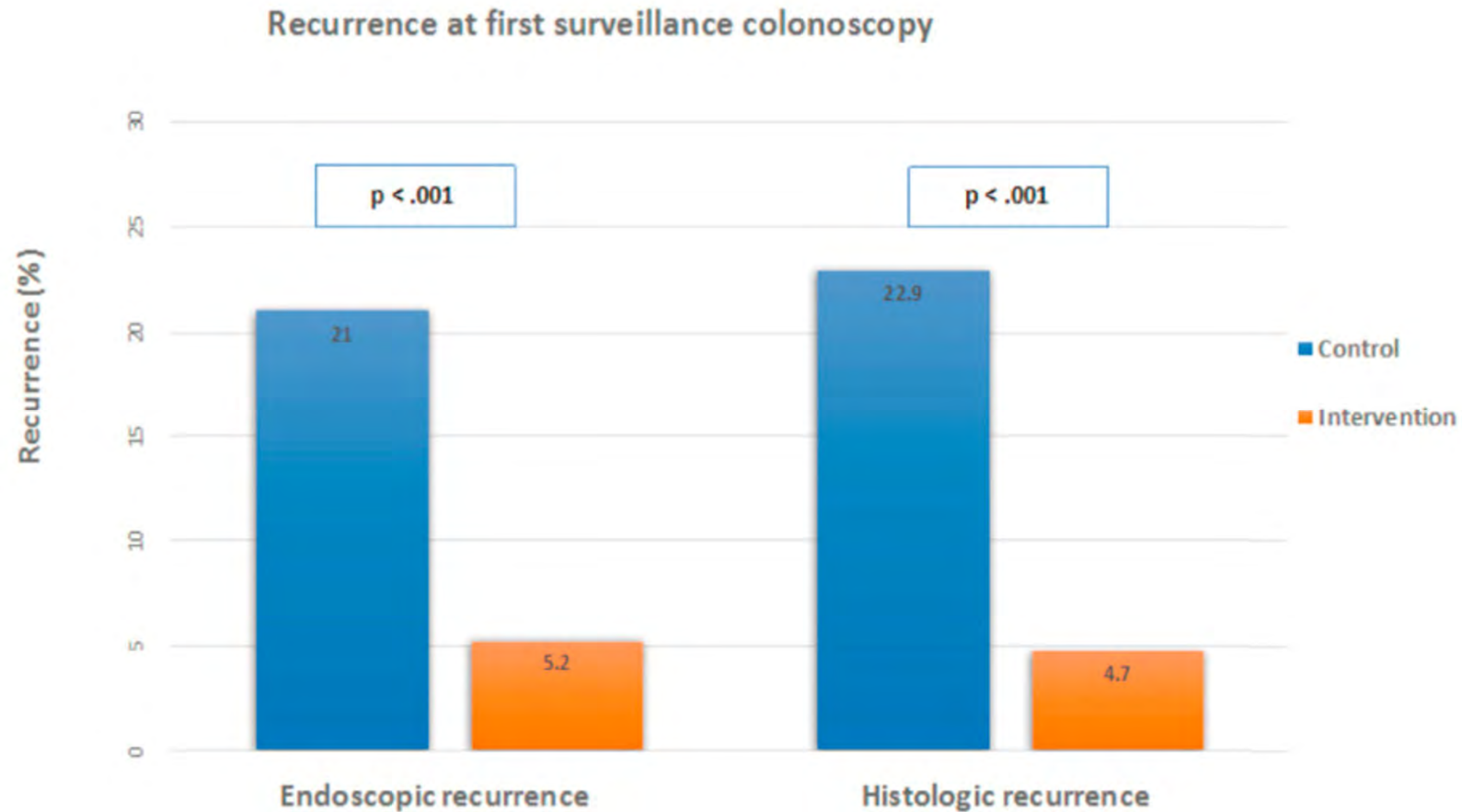
Techniques to Prevent Recurrence after WF-EMR

Professor Michael Bourke
Westmead Hospital
Sydney



Adjuvant thermal ablation of the margins

SCAR Study: RCT of Snare Tip Soft Coag

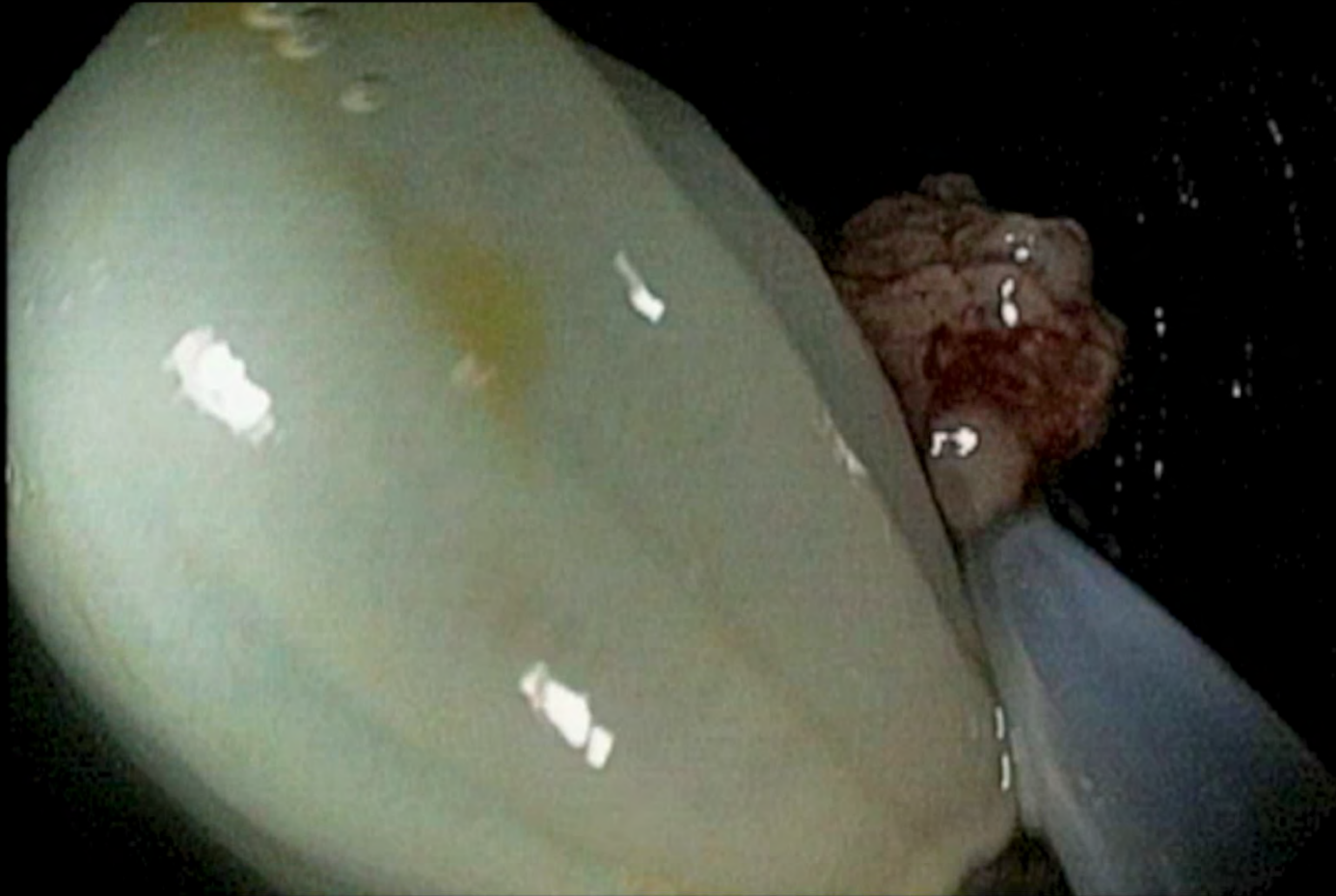


Overt and Occult Residual Neoplasia

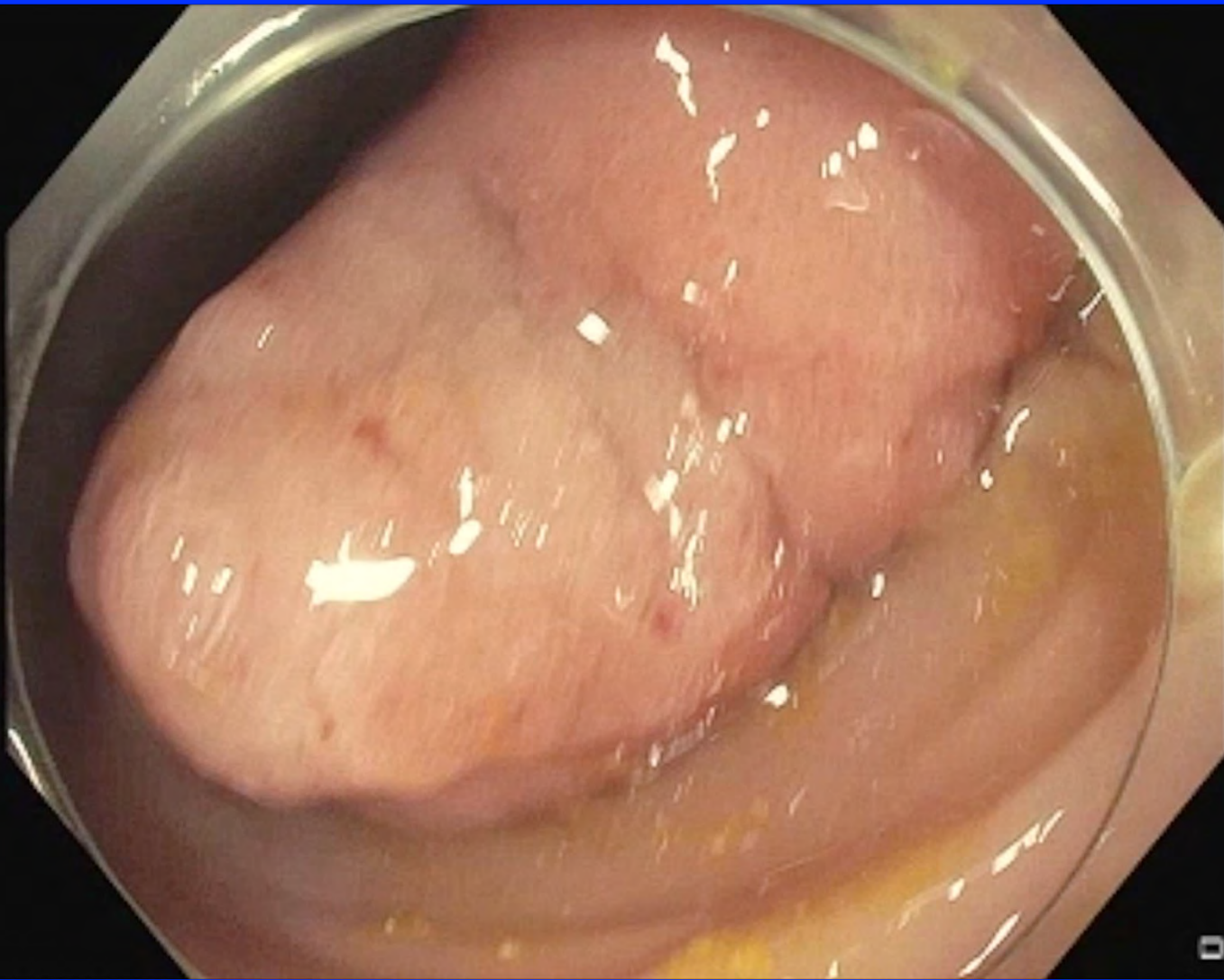
Overt: Visible Residual Neoplasia

Occult: Inapparent Residual Neoplasia

Avulsion – Rebirth of Hot Biopsy Forceps



Visible Residual Neoplasia



Safety of Hot Avulsion for Visible Residual Neoplasia

- ▶ 243 Pts with 265 Polyps > 2cm, mean 3.4cm
- ▶ Delayed bleeding in 11 (4.2%), 5 repeat colonoscopy
5 observation only
1 blood transfusion
- ▶ One procedural perforation closed with clips
- ▶ One with pain resolving with fasting and antibiotics
- ▶ Recurrence in 8/169 pts (4.7%), with Bx of 84% of scars

The fear of perforation or transmural burn is not justified and no greater when hot avulsion is used in addition to snare for large polyps!

APC vs Avulsion for Overt Residual Neoplasia

Resection	En Bloc EMR	Piecemeal EMR -no residual	Piecemeal -APC for residual neoplasia	Piecemeal -Avulsion for residual neoplasia
n	59	55	63	46
Recurrence	4.2%	3.0%	59.3%	10.3%

P<0.001

Overall recurrence was 26.4% and among the 223 polyps, 41% had prior manipulation

No perforation from Hot Biopsy Forceps

Friedland S, GIE, 2016

Hot avulsion technique for visible residual neoplasia is equivalent to thermal ablation of normal-appearing margin in reducing recurrence rates after endoscopic resection of large lateral spreading tumors in the colon

- ◆ **256 Pts with 280 Non Pedunculated Polyps >2cm (mean 34 mm)**
- ◆ **Conventional EMR and Hot Avulsion**
- ◆ **Meticulous inspection of the defect with Magnification and NBI**
- ◆ **Hot Avulsion for Visible Residual Neoplasia**
- ◆ **Follow up 6-12 mos with biopsy of the scar**

Hot avulsion technique for visible residual neoplasia is equivalent to thermal ablation of normal-appearing margin in reducing recurrence rates after endoscopic resection of large lateral spreading tumors in the colon

- ♦ **Follow up in 161 pts**
- ♦ **Recurrence noted in 8 pts (4.9%)**
- ♦ **Histologic Confirmation in 84%**

Margin marking before colorectal endoscopic mucosal resection and its impact on neoplasia recurrence (with video)

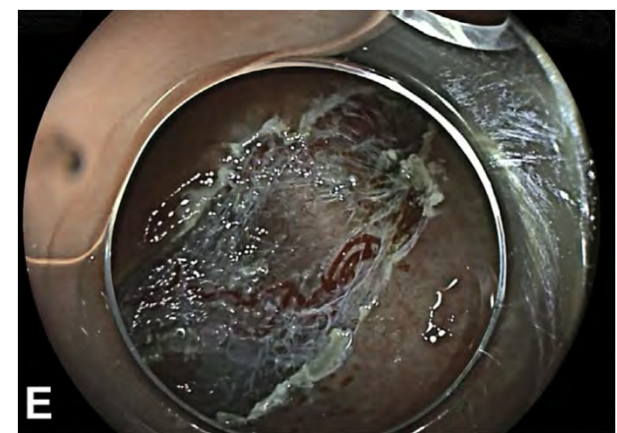
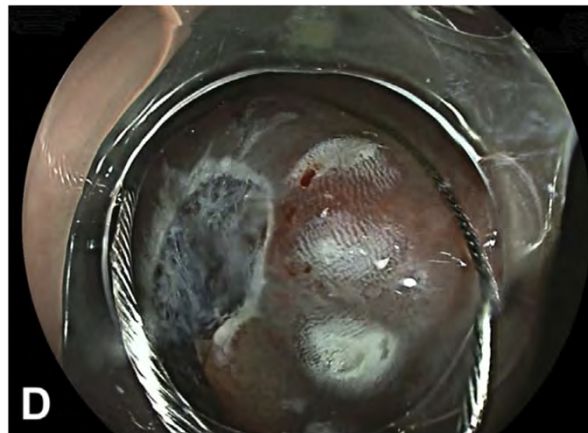
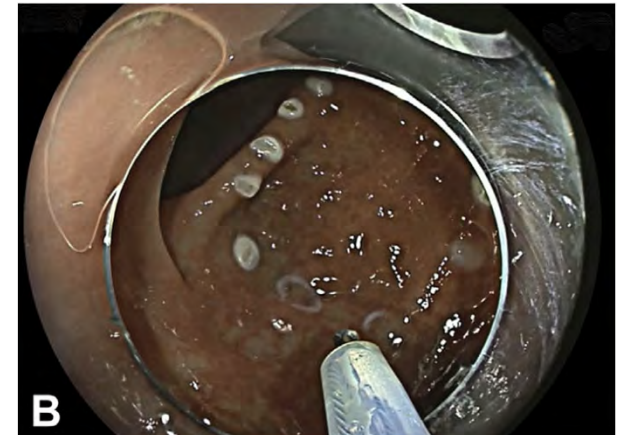
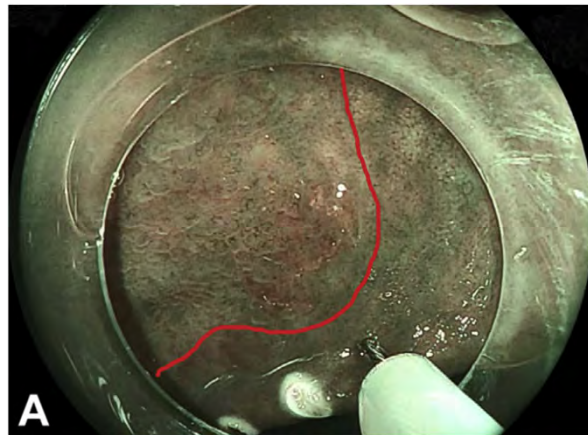


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Orlando, Gainesville, Florida; Lebanon, New Hampshire; White River Junction, Vermont, USA

GIE 2022

- Conventional EMR
Sept 2016-Aug 2019
- Margin Marks
Sept 2019 -Feb 2021



Margin marking before colorectal endoscopic mucosal resection and its impact on neoplasia recurrence (with video)



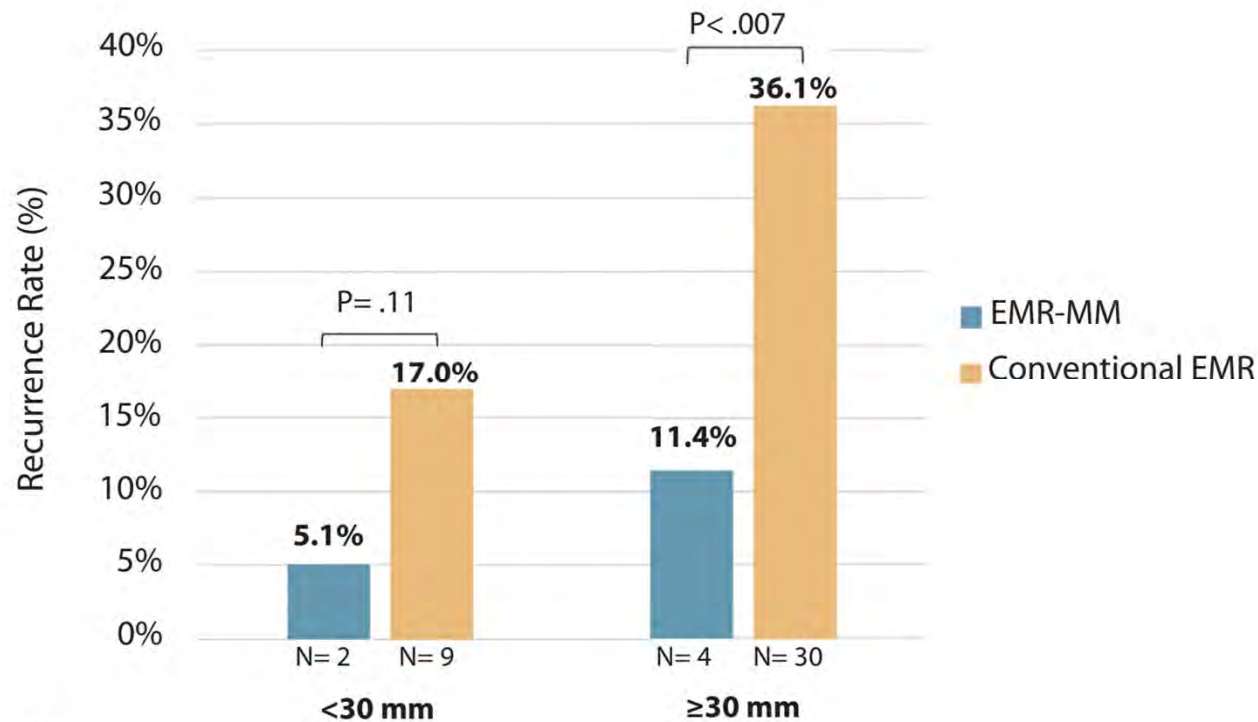
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GIE 2022



Biopsy sampling of EMR site during SC obtained from 100% (74/74) and 93.4% (127/136) of EMR-MM and control cases, respectively.



A

Piecemeal cold snare polypectomy versus
conventional endoscopic mucosal resection for large
sessile serrated lesions: a retrospective comparison
across two successive periods

ACE, Gut, 2021

- 574 Large (>20mm) Sessile Serrated Lesions, resected with 3mm normal margins excised
- Recurrence rate 6% at 18 mos
- No Difference between Cold Snare or Hot EMR

Outcomes of Thermal Ablation of the Mucosal Defect Margin After Endoscopic Mucosal Resection: A Prospective, International, Multicenter Trial of 1000 Large Nonpedunculated Colorectal Polyps

Gastroenterol 2021

Successful EMR n=1037	
Eligible for SC1 n=803	
Underwent SC1 755/803 (94%)	
Recurrence 3% (23/755)	

***Lack of Recurrence not histologically confirmed
Additional Maneuvers eg.wide margin not evaluated***

Clip Closure Does Not Reduce Risk of Bleeding After Resection of Large Serrated Polyps: Results From a Randomized Trial

Seth D. Crockett,^{*} Mouen Khashab,[‡] Douglas K. Rex,[§] Ian S. Grimm,^{*} Matthew T. Moyer,^{||} Amit Rastogi,[¶] Todd A. Mackenzie,[#] and Heiko Pohl,^{**,††}

- No Difference in Bleeding Rates
- 199 Large Serrated Polyps Randomized
- 88% Proximal (Trans to Cecum)
- Clip 2.3% No Clip 3.3% ns

Jumbo biopsy forceps versus cold snares for removing diminutive colorectal polyps: a prospective randomized controlled trial CME

Cheal Wung Huh, MD,¹ Joon Sung Kim, MD, PhD,¹ Hyun Ho Choi, MD,² I So Maeng, MD, PhD,³ Sun-Young Jun, MD, PhD,³ Byung-Wook Kim, MD, PhD¹

Seoul, Korea

GIE 2019

- Radial jaw 4 jumbo forceps
- 2 Bites All polyps

Vs

- 10 mm Cold Snare
- 1-2mm margin normal mucosa

TABLE 3. Complete resection rate of adenomatous polyps

Parameter	Total (n = 177)	JFP group (n = 87)	CSP group (n = 90)
Complete resection rate	163 (92.1)	80 (92.0)	83 (92.2)
Size, mm, mean $\pm$ SD	3.9 $\pm$.9	3.9 $\pm$.9	3.8 $\pm$.9
Size, mm			
≤ 3	54/56 (96.4)	24/25 (96.0)	30/31 (96.8)
> 3	109/121 (90.1)	56/62 (90.3)	53/59 (89.8)

Is there a crack in the armor?

- Extended Mucosal Resection by the same group did not show reduced recurrence. (Bahin FF, GIE, 2016)
- The ACE consortium reported recurrence rates of 16% in 1000 polyps without marginal ablation, lower than the 21% in the control group. (Moss A, Gut, 2015)
- Broad Range of Recurrence among endoscopists, 0-21% in the treatment arm, 0-42% in the control group
- Histology was not uniformly obtained at follow up

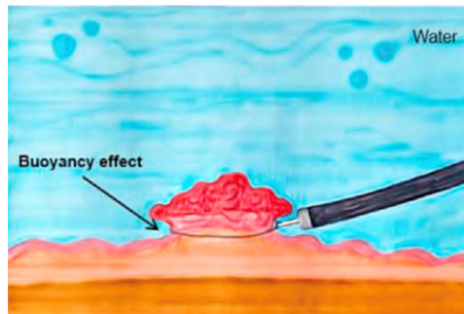
Underwater vs Conventional Endoscopic Mucosal Resection of Large Sessile or Flat Colorectal Polyps: A Prospective Randomized Controlled Trial



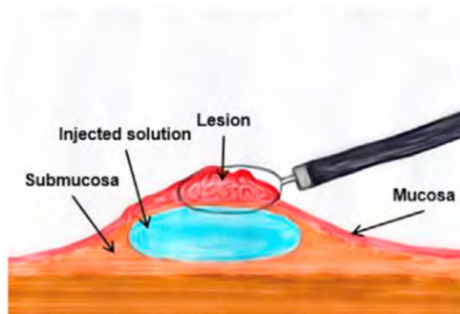
Gastroenterol 2021

Sandra Nagl,¹ Alanna Ebigbo,¹ Stefan Karl Goelder,¹ Christoph Roemmele,¹ Lukas Neuhaus,¹ Tobias Weber,¹ Georg Braun,¹ Andreas Probst,¹ Elisabeth Schnoy,¹ Agnieszka Jowita Kafel,¹ Anna Muzalyova,¹ and Helmut Messmann¹

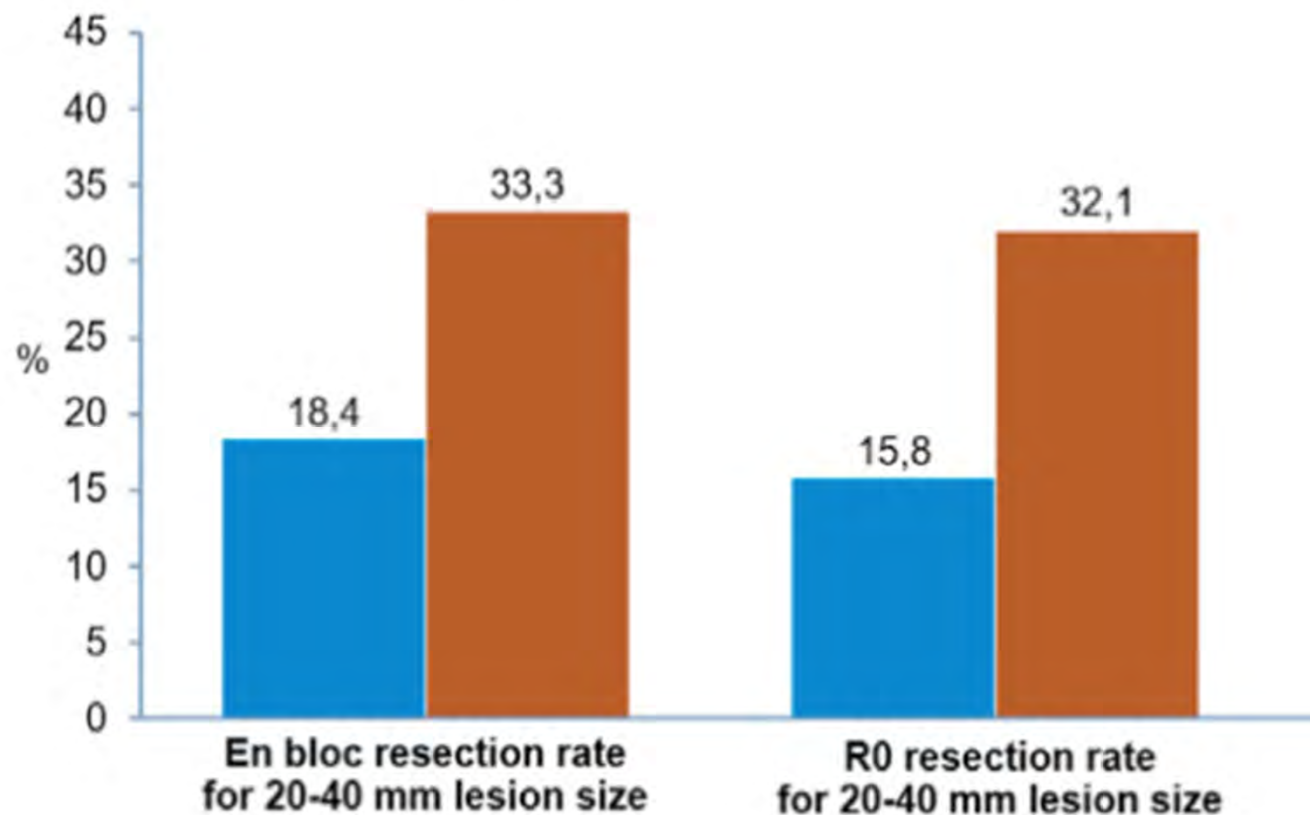
Underwater EMR



Conventional EMR



Resection Time Shorter 8 vs 14 minutes



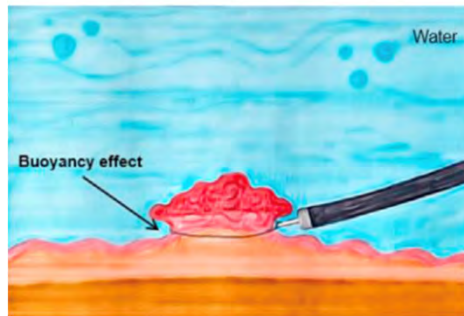
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Gastroenterol 2021

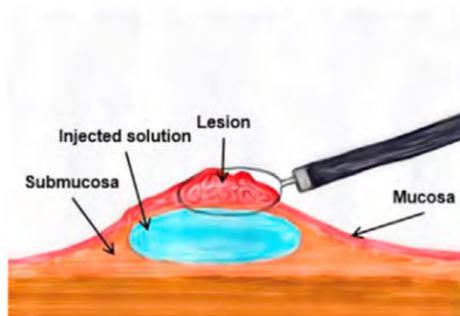
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Underwater EMR



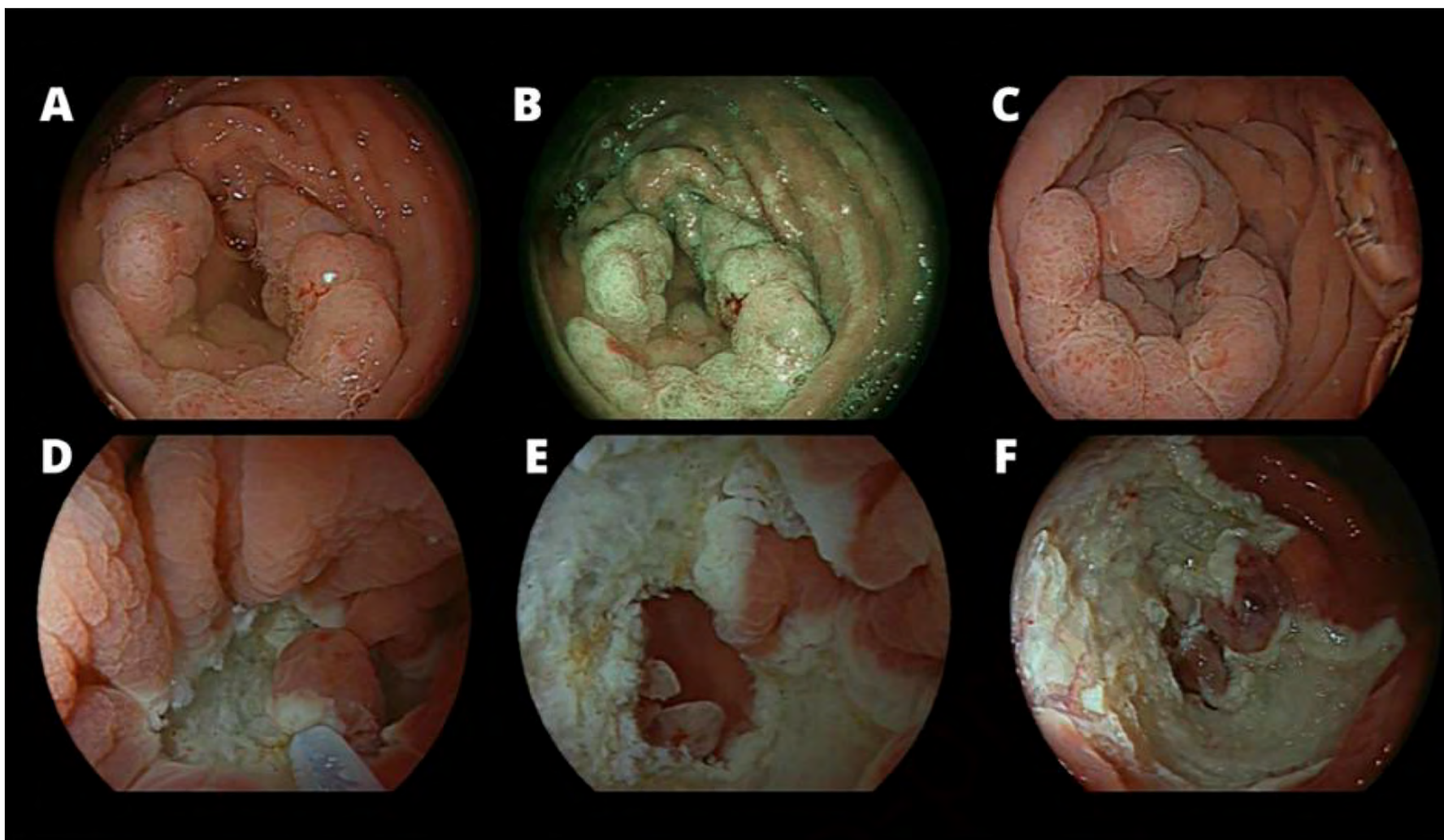
Overall recurrence rate was 15.1% in the UEMR group and 24.6% in the CEMR group ($P = .253$).

Conventional EMR



Underwater vs Conventional EMR of Large Non Pedunculated Colon Lesions

Spanish Multi Center Study Group. GIE, 2023



Underwater vs Conventional EMR of Large Non Pedunculated Colon Lesions

Spanish Multi Center Study Group. GIE, 2023

- ◆ 11 Spanish Hospitals, 2 year enrollment, 298 pt, 311 lesions
- ◆ UEMR 149 vs CEMR 162
- ◆ Primary Outcome Recurrence at 6 and 12 months
- ◆ Secondary Outcomes

Success, En Bloc, R0 margins, Time, Adverse Events

Underwater vs Conventional EMR of Large Non Pedunculated Colon Lesions

Spanish Multi Center Study Group. GIE, 2023

						Polyp size: < 30 mm
						Primary Outcome
Recurrence	ITT	CEMR	61	0	8	13.1%
		UEMR	58	0	2	3.4%
	PP	CEMR	54	0	8	14.8%
		UEMR	58	0	2	3.4%

						Polyp size: ≥ 30 mm
						Primary Outcome
Recurrence	ITT	CEMR	84	0	9	10.7%
		UEMR	79	0	11	13.9%
	PP	CEMR	77	0	9	11.7%
		UEMR	71	0	7	9.9%

Underwater vs Conventional EMR of Large Non Pedunculated Colon Lesions

Spanish Multi Center Study Group. GIE, 2023

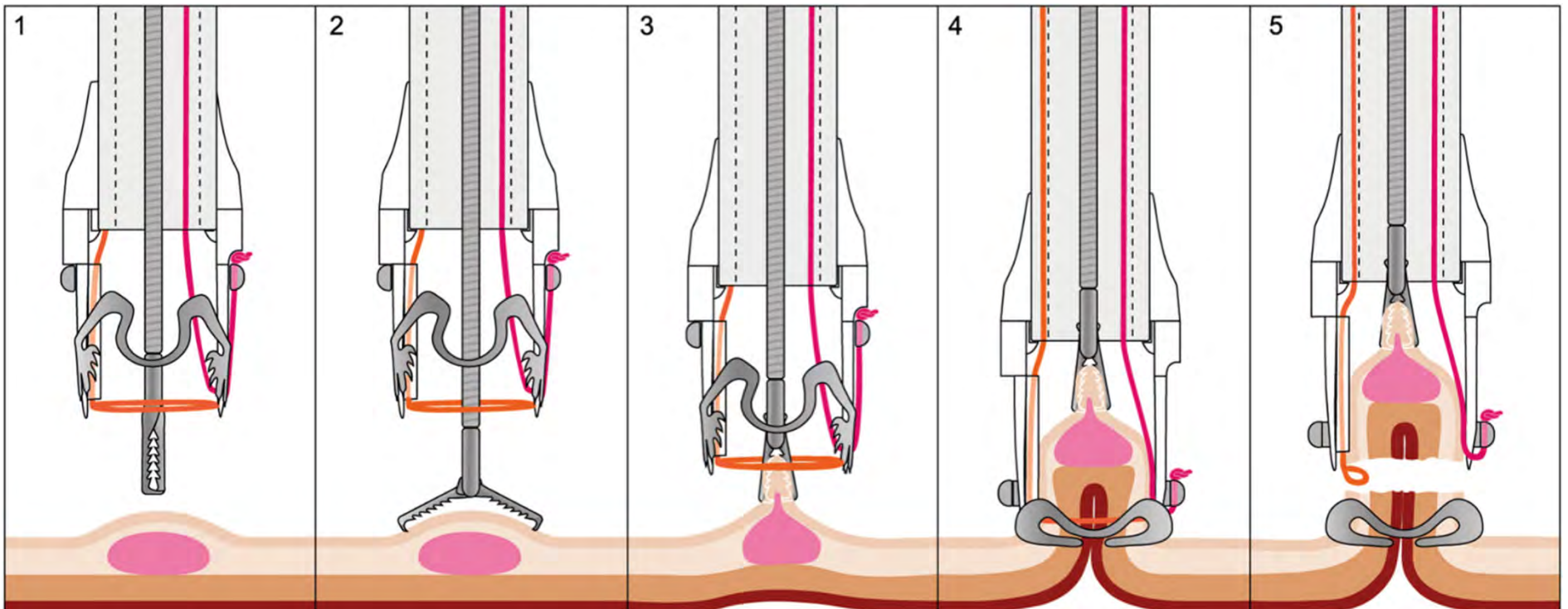
Variable	Total N	levels	CEMR (%)	UEMR (%)
Bleeding	311 (100.0)	No	124 (76.5)	118 (79.2)
		Delayed bleeding	13 (8.0)	7 (4.7)
		Immediate bleeding	25 (15.4)	24 (16.1)
Blood transfusion	292 (93.9)	No	155 (98.7)	133 (98.5)
		Yes	2 (1.3)	2 (1.5)
Perforation	311 (100.0)	No	157 (96.9)	145 (97.3)
		with endoscopic resolution	5 (3.1)	4 (2.7)
PPS	305 (98.1)	No	157 (98.1)	143 (98.6)
			3 (1.9)	2 (1.4)
Fever	311 (100.0)	No	160 (98.8)	146 (98.0)
		Yes	2 (1.2)	3 (2.0)
Abdominal pain	302 (97.1)	No	157 (98.1)	140 (98.6)
		Yes	3 (1.9)	2 (1.4)
Admission	311 (100.0)	No	147 (90.7)	138 (92.6)
			15 (9.3)	11 (7.4)

Rescue Therapy for Unsuccessful EMR - FTRD

- Neoplastic Polyps not amenable to conventional resection techniques
- Early Cancer to ensure vertical R0 resection margins
- Resection of scar or residual malignant polyps after incomplete removal
- Resection of intracavitary lesions in appendix or diverticulum
- Subepithelial Tumors
- Diagnostic for neuro-muscular disorders such as Hirschsprung's or Gastroparesis

*Stand Alone FTR limited to <30mm Diameter
If tissue compliant and can be pulled into cap.
The cap internal diameter is 12.1-13.5 mm*

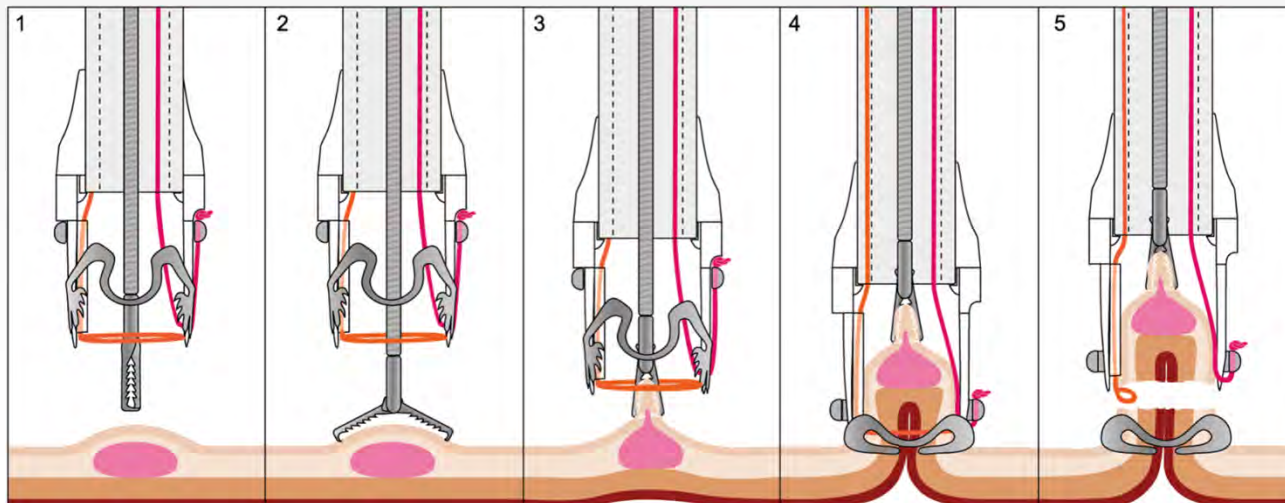
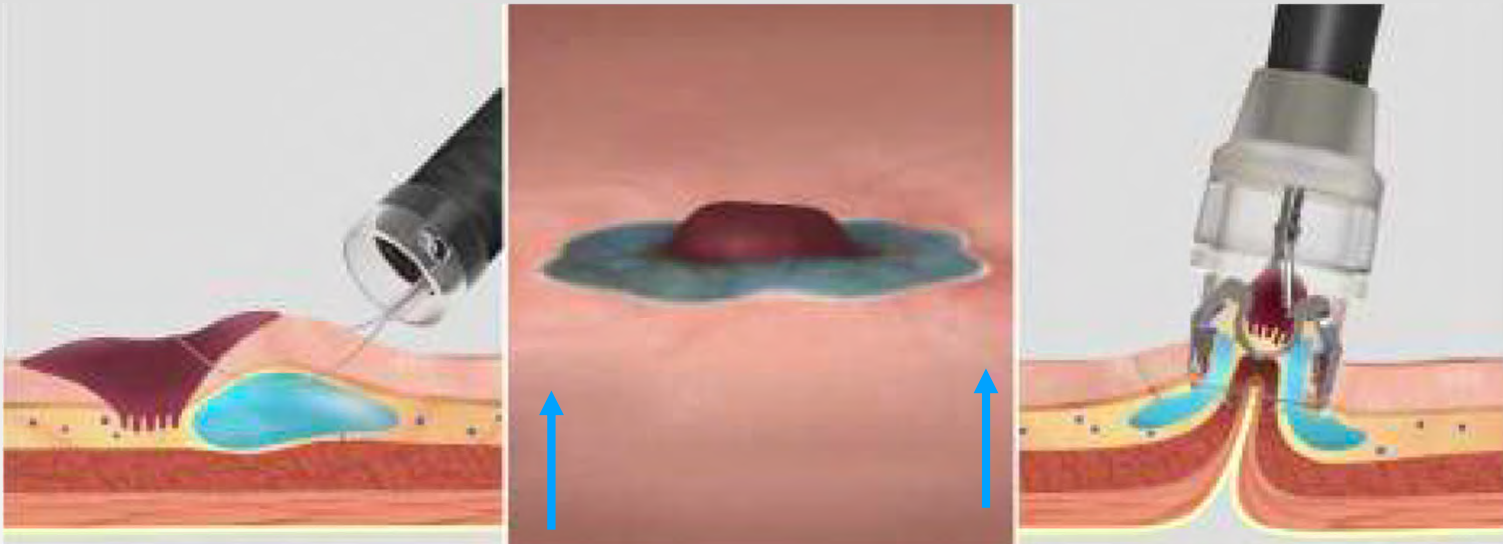
Endoscopic FTRD



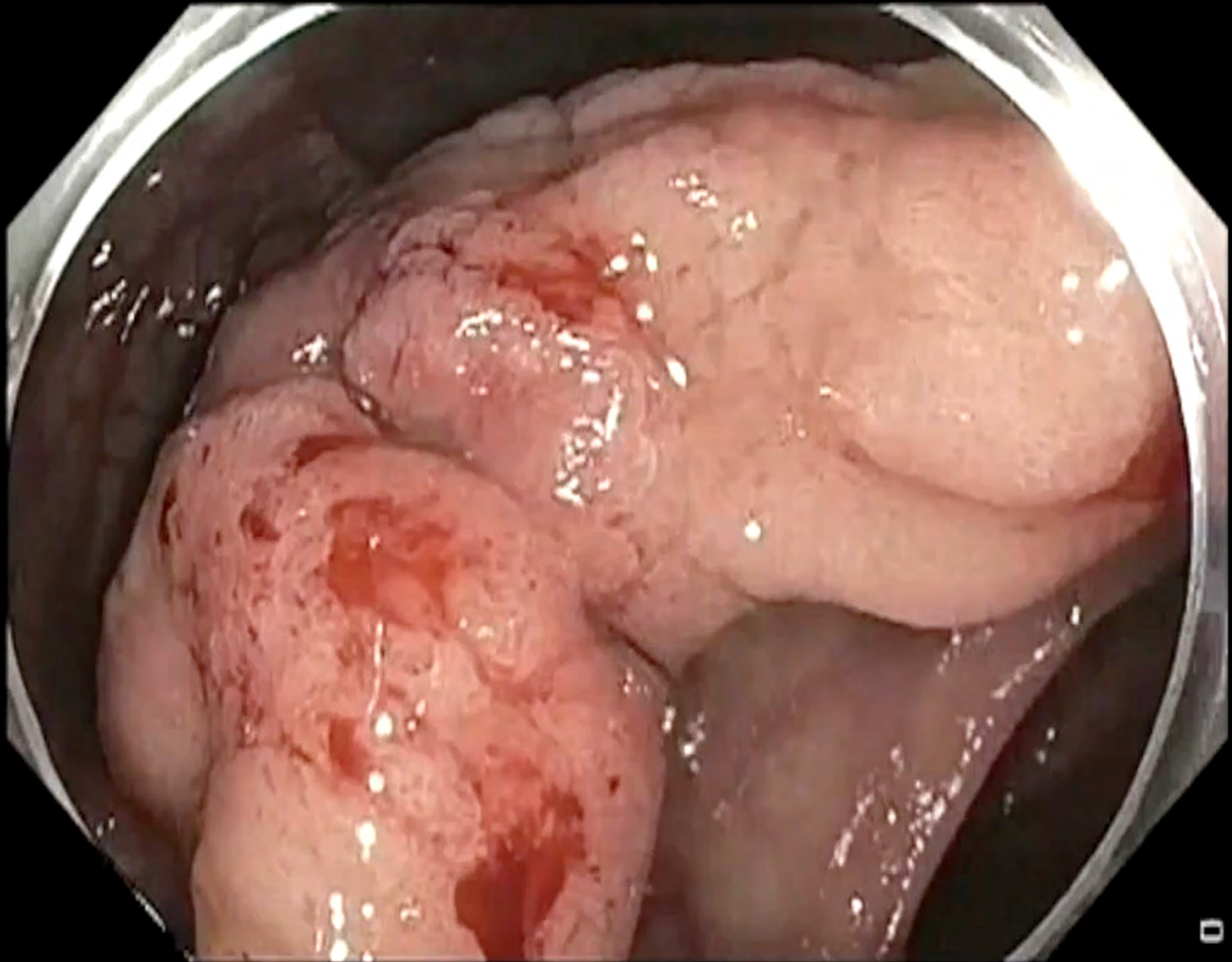
Outcomes of a hybrid technique using EMR and endoscopic full-thickness resection for polyps not amenable to standard techniques (with video)

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Hybrid FTR



Clinical Success: *'Macroscopically Complete Removal of Entire Target Lesion'*

	Total	FTR only	Hybrid
Clinical success, n (%)	63 (91.3)	34 (89.5)	29 (93.6)
<u>Reasons for clinical failure, n (%)</u>			
Could not advance device to lesion	4 (5.7)	2 (5.3)	2 (6.5)
Unable to salvage technical failure	0 (0)	0 (0)	1 (3.2)
Macroscopically incomplete resection	0 (0)	0 (0)	1 (3.2)
<u>R0 resection rate</u>			
Overall, n (%)	56 (81.2)	30 (79.0)	26 (83.9)
Among clinically successful	56/63 (88.9)	30/34 (88.2)	26/29 (89.7)

What Do I Do?

- ≤ 3 mm Regular or Jumbo Forceps, Water Jet
- 3-4 mm Jumbo Forceps
- 5-15 mm SSL Cold Snare
- 10-50+ Adenoma EMR + Hot Avulsion
- 15-30+ SSL EMR + Hot Avulsion
- 10-25mm Underwater

Hot avulsion technique for visible residual neoplasia is equivalent to thermal ablation of normal-appearing margin in reducing recurrence rates after endoscopic resection of large lateral spreading tumors in the colon

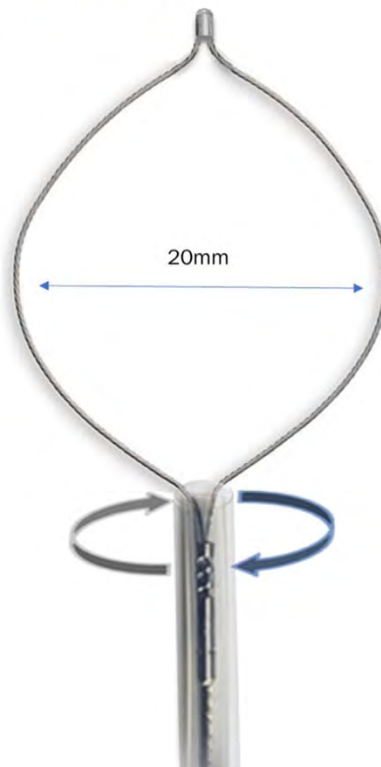
- ♦ **256 Pts with 280 Non Pedunculated Polyps >2cm**
- ♦ **Conventional EMR and Hot Avulsion**
- ♦ **Meticulous inspection of the defect with Magnification and NBI**
- ♦ **Hot Avulsion for Visible Residual Neoplasia**
- ♦ **Follow up 6-12 mos with biopsy of the scar**

*First snare designed specifically
for STSC, "Snare Tip Soft
Coagulation"*



Fulguration Tip Snare

- Energy concentration tip at distal end to focalize the energy for pinpoint accuracy
- 1:1 Rotation
- Stiff braided round wire (0.42mm)



Snare Tip Soft Coagulation



Tissue Resection

