Submucosal Lift During Underwater Endoscopic Mucosal Resection Preserves the Benefits of Underwater Technique

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Introduction

- Conventional injection-assisted endoscopic mucosal resection (EMR) is a widely accepted method for removal of laterally-spreading non-pedunculated polyps ≥10 mm.
- Underwater EMR (uEMR) is an emerging technique which may result in higher en bloc resection and lower adenoma recurrence.
- uEMR typically does not include submucosal injection for lifting the lesion, which may contribute to its limited adoption among practitioners of EMR.
- In this study, we aim to determine the safety and efficacy of underwater EMR with lift (uEMR-L) for large polyp resection.

Methods

- uEMR-L was performed at a single center by an expert endoscopist over a 3 year period.
- A pediatric colonoscope with a transparent cap was advanced to the lesion and inspected with air insufflation and then with the lumen filled with sterile water.
- Intentionally limited submucosal injection was performed using a saline-based solution with methylene blue and dilute epinephrine.
- The lesion was then resected using a snare in en bloc or piecemeal fashion at the discretion of the endoscopist.
- Surveillance examination was planned in 6 months following uEMR-L.
- Data regarding patient age, sex, submucosal injection volume, procedural complications, and polyp size, morphology, histology, and recurrence was collected and included in our analysis.

Results

Patient demographics (N=51)		
Sex	**N**	**Percentage (%)**
Male	51	100
Female	0	0
Age	**Mean (years)**	**Std. Dev.**
	69.0	6.3

Lesion Characteristics (N=66)		
Size	**Avg (mm)**	**Range (mm)**
	27.4	15-60
Injection Volume	**Median (ml)**	**Range (ml)**
	7	2-30
Appearance	**N**	**Percentage (%)**
Granular	52	78.8
Sessile	14	98.5
Resection	**N**	**Percentage (%)**
Complete	62	94
Complete, En Bloc	10	16
Incomplete	4	6
Complications	**N**	**Percentage**
Delayed Bleeding	1	2

Surveillance (N=50/62)		
Recurrence	**N**	**Percentage (%)**
Residual Polyp Tissue	2	4.0%

Discussion

- **A limited submucosa lift provides multiple benefits**
  - Orienting the lesion
  - Highlighting lesion borders
  - Detecting submucosal invasion via lack of lift
  - Limiting the chance of deep thermal injury
  - Allowing detailed inspection of the mucosal defect after resection
- **These benefits can be achieved with a small volume lift in which the lesion is noted to "flutter" when additional water is instilled in the colon**
- **uEMR-L has a comparable median size of *en bloc* resection (19mm) to published studies of traditional uEMR**

uEMR-L Procedure

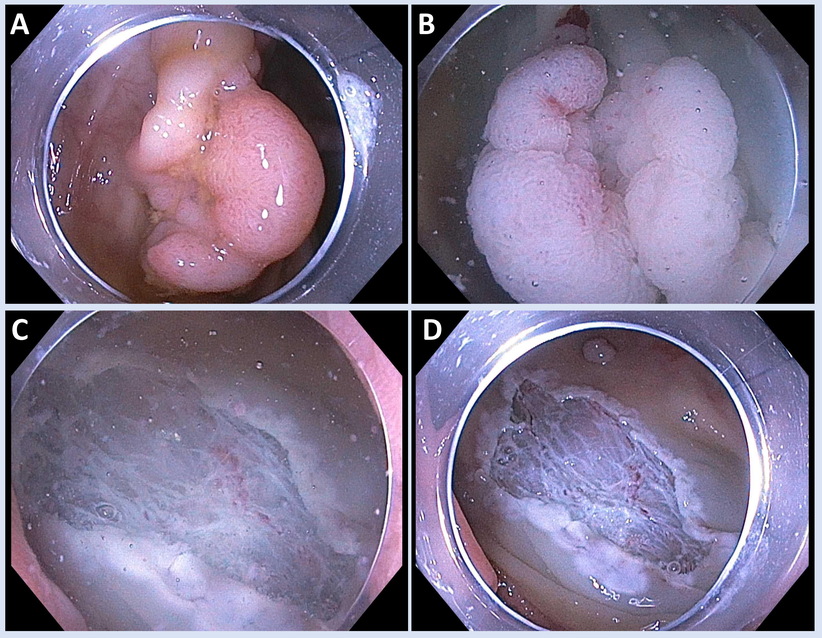

Figure 1: Images from uEMR-L procedure. (A) 30 mm cecal polyp, Paris classification 0-1s, granular. (B) View after water immersion and submucosal injection of 5 cc saline-based solution with methylene blue. (C) Post-resection defect with blue-stained submucosa. (D) Post-resection after thermal therapy of defect edges with CO2 insufflation of the cecum.

Conclusion

uEMR-L is a safe and effective technique for endoscopic mucosal resection of large nonmalignant colon polyps.

This specific technique may preserve the benefits of underwater resection and serve as an entry point for endoscopists without previous experience in underwater EMR.

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