

# Underwater EMR for Medium Sized Colorectal Sessile Polyps



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This summary reviews Deng Q, Wu Z, Li J, et al. Underwater endoscopic mucosal resection is superior to conventional endoscopic mucosal resection for medium-sized colorectal sessile polyps: A randomized controlled trial. *Sci Rep* 2024; 14: 30172.

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## STRUCTURED ABSTRACT

**Question:** Is underwater endoscopic mucosal resection (u-EMR) superior to conventional EMR for treatment of medium-sized colorectal polyps?

**Design:** Open-label, randomized controlled trial.

**Setting:** Single academic medical center in China.

**Patients:** Two hundred and sixty-one consecutive patients were assessed for eligibility and 200 inpatients with medium-sized colorectal sessile polyps (between 10 mm to 20 mm) between December 2022 and February 2024 were included. All procedures were performed by 3 experienced endoscopists. Inclusion criteria included those aged 18-70 years who had a sessile polyp between 10-20 mm in diameter. Prior to inclusion pathologic biopsy and digital chromoendoscopy was performed. Exclusion criteria included those patients who

would not cooperate with the protocol, or who had malignant polyps, were on aspirin or with severe cardiopulmonary disease or bleeding diathesis.

**Intervention:** Patients were randomized to u-EMR versus conventional EMR. U-EMR was performed using saline immersion followed by snare resection using electrocautery. For conventional EMR, submucosal injection was performed using normal saline followed by snare resection using electrocautery. En-bloc resection was attempted first and if not possible, then the lesion was resected in piecemeal fashion. Residual lesion was treated with APC. Decision to perform defect closure was at the discretion of the endoscopist.

**Outcome:** The primary outcome was R0 resection rate. Secondary outcomes included en-bloc resection rate, R1 and Rx resection rates, visual analogue scale (VAS) of abdominal pain and adverse events. R0 resection was defined as a complete resection of a lesion with lateral and deep negative margins. R1 resection was defined as residual dysplasia under the microscope but no macroscopic residual polyp during colonoscopy.

**Data analysis:** Quantitative data were compared using the independent sample *t* test or nonparametric Mann-Whitney U test as appropriate. Qualitative data were compared using the chi-square test or Fisher's exact test as appropriate.

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**Results:** Two hundred patients with medium-sized colorectal sessile polyps were randomly divided into u-EMR group and conventional-EMR group. The R0 resection rate (73.3% vs 56.3%,  $P=0.011$ ) and the en-bloc resection rate (91.1% vs 80.6%,  $P=0.032$ ) of the u-EMR group were significantly higher than those of the conventional EMR group. The mean abdominal pain score of the u-EMR group was significantly lower than that of the conventional EMR group  $[(3.2\pm1.9)$  vs  $(4.1\pm2.1)$ ,  $P=0.006$ ]; There was no significant difference in the intra-procedure bleeding rate between the groups (4.0% vs 6.1%,  $P=0.516$ ). There was no delayed bleeding and perforation in both groups.

## COMMENTARY

### *Why Is This Important?*

As resection techniques evolve and new ones develop, data regarding their efficacy for colon polyp resection are important for practicing endoscopists. In addition, it is critical to ascertain which techniques are more effective for medium sized colorectal polyps, defined as polyps between 10-20 mm in size.<sup>1, 2</sup> The current study adds to the literature by comparing conventional EMR with u-EMR for removal of these medium sized sessile colorectal polyps.<sup>3</sup> Lastly, this study demonstrated that abdominal pain, an important outcome, is significantly less with u-EMR as compared to c-EMR in this patient group who had minimal or no sedation.

### *Key Study Findings*

U-EMR is superior to conventional EMR in terms of R0 resection rate and en-bloc resection rates for medium sized sessile colorectal polyps.

Patients undergoing u-EMR had less abdominal pain as compared to those who underwent conventional EMR. There was no significant difference in intra-procedural bleeding rate between the two groups.

### *Caution*

The results of the study need to be interpreted with the following caveats.

Firstly, the technique of conventional EMR involved submucosal injection of only saline. In the United States saline is mixed with either methylene blue or a commercially available submucosal injectate. It is possible that submucosal injection with a more viscous solution will lead to better resection outcomes (R0 resection and en-bloc resection) with conventional EMR. Secondly, there are no long-term follow up data on recurrence rates, which is an important outcome in resection studies and perhaps the more clinically meaningful outcome. It is however challenging at times to obtain long-term follow up data, and some prior studies have also used biopsy of the base and margin during the index procedure to evaluate for residual dysplasia/polyp. Also, this was a single center study so the results may not be generalizable. Lastly, approximately 20% of the lesions included in the study were sessile serrated lesions (SSLs), and there is ample information that SSLs can be effectively removed with cold snare either using cold snare polypectomy or cold snare EMR.<sup>4, 5</sup>

### *My Practice*

My practice for managing medium sized polyps between 10-20 mm is individualized to the lesion.<sup>6</sup> This includes evaluating the polyp morphology and histology. The Paris classification is typically used to evaluate the polyp morphology. The Paris classification characterizes lesions in the gastrointestinal tract into

three main categories based on their morphologic features: polypoid (type 0-I), flat (0-II), and excavated (0-III). Type 0-I lesions are lesions that are elevated or protruding and can be further divided as pedunculated (0-Ip) or sessile (0-Is). Type 0-II lesions have flat or superficial surface morphology and can be characterized as slightly elevated (0-IIa), completely flat (0-IIb), or slightly depressed (0-IIc). The last lesion type is excavated (0-III) and indicates ulcerated or excavated lesions.

For polyp histology, the Narrow Band Imaging Colorectal Endoscopic (NICE) classification is used. The NICE classification system uses narrow band imaging to characterize polyps into three types based on their surface features: lesion color relative to background, appearance of blood vessels, and surface patterns. Type 1 lesions usually represent sessile serrated lesions or hyperplastic polyps and are similar in color to surrounding mucosa, have a lacy vessel pattern or lack vessels, and a surface pattern with dark or white spots that are uniform in size. Type 2 lesions are brown relative to background with brown vessels surrounding white structures with an oval, tubular, or branched pattern and are typical of conventional adenomas. Type 3 lesions are brown or black relative to surrounding mucosa with areas of missing or disrupted vessels, have an amorphous or absent surface pattern, and suggest deep submucosal invasion. For polyps with optical diagnosis suggestive of SSL histology, I prefer cold snare polypectomy or cold

snare EMR.<sup>1</sup>

I typically use submucosal injection only if the borders of the polyp are subtle and difficult to discern. In those cases, performing submucosal injection allows for better delineation of the polyp. For polyps between 10-20 mm, where optical diagnosis is suggestive of adenomatous histology, I also prefer cold snare polypectomy or cold snare EMR, unless there are features suggestive of advanced histology such as high grade dysplasia or submucosal invasive cancer (non-granular laterally spreading tumors with ulceration, depression or nodular component, NICE type 3 lesions, Kudo pit pattern V<sub>N</sub>, JNET2b or Paris classification 0-IIc), in which case I prefer en-bloc resection with conventional EMR.

### ***For Future Research***

Future research is needed to compare different EMR modalities for various types of polyps based on size and histology.

### ***Conflict of Interest***

Dr. Bilal is a consultant for Boston Scientific, Steris Endoscopy, Aspero Medical and Cook Medical.

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