EVIDENCE-BASED GI
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# Standardized Training for Endoscopic Mucosal Resection of Large Polyps: Does it Reduce Recurrence?



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This summary reviews Meulen LWT, Bogie RMM, Siersema PD, et al. Standardised training for endoscopic mucosal resection of large non-pedunculated colorectal polyps to reduce recurrence (*STAR-LNPCP study): a multicentre cluster randomised trial. Gut. 2024; 73(5):741-750.

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## STRUCTURED ABSTRACT

**Question:** Does standardized endoscopic mucosal resection (EMR) training reduce the recurrence rates of large non-pedunculated colorectal polyps (LNPCPs)?

**Design**: Multicenter cluster randomized trial. Each community hospital nominated ≥1 endoscopist dedicated to EMR of LNPCPs at their institution. Randomization was performed based on hospital (i.e., all endoscopists from each hospital participated exclusively in the intervention group or control group).

**Setting:** Thirty Dutch community hospitals between April 2019 and August 2021.

**Patients**: From April 2019 through August 2021, consecutive EMR-treated LNPCPs were included. All patients above age 18 with LNPCP suitable for EMR were included.

**Intervention**: The endoscopists were divided into an intervention group, which received e-learning and a 2-day hands-on training session and a control group. The 2 -day hands-on training consisted of lectures, case-based discussions, and hands-on sessions. E-learning modules covered all aspects of EMR, including injection fluids (colloid, dye, epinephrine), types of snares, techniques of piecemeal and en bloc resection, performance of margin thermal ablation, and identification and management of residual tissue after snaring. All study endoscopists completed e-learning modules on identification of post-EMR scar and protocol for obtaining biopsies from the post-EMR scar.

**Outcomes:** Primary outcome was recurrence rate after 6 months. A standardized protocol, including assessment of EMR scar with multiple images of scar obtained with white light, zoom focus, narrow band imaging, virtual chromoendoscopy or blue-light imaging was followed. Recurrence, which was defined as visible neoplastic tissue in or within 5 mm of scar, was determined by independent reviewers blinded to treatment allocation. If visible neoplastic tissue was present, then this was removed endoscopically and reported. If there were no signs of recurrence, then the EMR scar was biopsied per standardized protocol at the center and each peripheral quadrant.

Secondary aims included comparison of recurrence rates stratified by LNPCP size (20-29 mm, 30-39 mm, $\geq$ 40 mm), EMR techniques (e.g., lifting fluid used, number of pieces, use of adjunctive treatments or margin thermal ablation), and complication rates between the 2 groups.

**Data Analysis**: Intention to treat analysis. All consecutive non-invasive LNPCPs, suitable for EMR, were included in the study.

**Funding:** Dutch Cancer Society.

**Results:** Among 30 community hospitals, a total of 59 endoscopists participated. From April 2019 through August 2021, 1,412 large non-pedunculated colorectal polyps (699 in the intervention group, 713 in the control group) were study eligible with 98% undergoing EMR. A total of 1,277 lesions (90%) underwent 6-month repeat colonoscopy to assess for recurrence with post-EMR scar identified in 1,215 lesions, which were then utilized for primary outcome assessment. For these 1,215

post-EMR lesions/scars, the initial median polyp size was 30 mm, and both groups had similar distributions in terms of size, morphology, site, and access scores.

There were significant differences in EMR technique among the intervention group versus the control group. The intervention group was more likely to add epinephrine to the lifting fluid (73% vs 41%, respectively, $P > 0.001$), use colloid lifting fluid instead of normal saline (87% vs 63%, respectively, $P < 0.001$), identify residual tissue after snaring (24% vs 18%, respectively, $P = 0.003$), and perform margin thermal ablation (92% vs 75%, respectively, $P < 0.001$).

There was a significantly lower recurrence rate in the intervention group compared to the control group: 13% vs 25%, respectively; odds ratio (OR) 0.43; 95% confidence interval (CI) 0.23-0.78, $P = 0.005$. Recurrence was more often unifocal in the intervention group (92% vs 76%, $P = 0.006$). The largest benefit of the intervention was for polyps 20-29 mm (5% vs 20%, respectively; OR 0.20; 95% CI 0.08-0.52) and 30-39 mm (10% vs 21%, respectively; OR 0.36; 95% CI 0.16-0.81), but there was no significant difference for lesions >40 mm (24% vs 31%, respectively, $P = 0.151$).

Intraprocedural adverse events (e.g., intraprocedural bleeding or damage to muscularis propria) was similar between groups (29% vs 35%, $P = 0.258$) and were also similar for complication rates requiring hospitalization or emergency treatments/evaluations (8% vs 9%) with 1 perforation occurring in 1% of cases in both

## COMMENTARY

### *Why Is This Important?*

EMR is a safe and effective modality for resecting LNPCPs ≥20 mm where invasion is not suspected. However, recurrence after EMR of LNPCPs is common (up to 30%) but can be reduced significantly in expert centers to less than 5% by utilizing various techniques depending on the primary resection modality.[1,2] This study shows how a standardized 2-day course with hands-on training and e-learning modules can significantly impact recurrence rates among community practicing gastroenterologists.

### *Key Study Findings*

Standardized EMR training among community gastroenterologists significantly reduced recurrence rates at 6 months by 50% in this study that included 1,412 polyps.

This is substantial improvement given the low intensity of the 2-day training course. Largest effect was seen among polyps 20-40 mm where a recurrence reduction for lesions size 20-29 mm (5% vs 20%, OR 0.20; 95% CI 0.08-0.52, $P = 0.001$) and 30-39 mm (10% vs 21%, OR 0.36; 95% CI 0.16-0.81, $P = 0.013$)

whereas for polyps ≥40 mm (24% vs 31%, OR 0.61; 95% CI 0.31-1.20; $P$ = 0.151).

### *Caution*

It is unclear which items in the training course contributed most to the significant decrease in recurrence rate as the course delved into multiple aspects of performing an EMR as well identifying residual tissue and recurrent polyps. There was also variation in recurrence rate between centers where the highest recurrence rates were noted in centers with lower volumes. In addition, it is possible that simply attending the course led those endoscopists to become more enthusiastic about honing their resection skills.

### *My Practice*

While I can't employ the specific 2-day hands-on training and e-learning modules used in this trial, the study methodology is similar to the approach of my GI group. First, similar to study endoscopists, I'm designated as the primary endoscopist for complex EMR in my group. Although I didn't complete an advanced endoscopy fellowship, I actively sought hands-on training in my GI fellowship to maximize my volume of complex EMR. If you didn't get enough of this hands-on training, then the American Society for Gastrointestinal Endoscopy (ASGE) offers this in multiple settings, including in the hands-on workshops at the American College of Gastroenterology Annual Meeting and at Digestive Disease Week. I also studied multiple ASGE website videos on optimal performance of EMR. These educational videos seem similar to this study's e-learning modules. For example, I learned to mix epinephrine with a colloid injection fluid to lift LNPCPs. This is especially important to minimize bleeding when doing piecemeal cold snare. Before I do any injection, I carefully identify the margins of the polyp using zoom focus, high-definition white light, and narrow band imaging. This is crucial to facilitate identification of residual tissue both centrally and at polyp margins after beginning resection. I also routinely use soft-tip coagulation for thermal ablation of polyp margins among other tips to minimize recurrence.

Finally, allowing adequate time for complex EMR and optimizing procedure volume minimizes recurrence when doing EMR of large non-pedunculated colorectal polyps. Since my schedule includes extended endoscopy slots for complex EMR, my colleagues frequently refer patients with LNPCPs after obtaining a pinch biopsy of the lesion and injecting dye 2 folds distal (i.e., closer to the rectum) from the lesion to facilitate polyp location on repeat colonoscopy. This is certainly preferable to initiating EMR but failing to complete it. Incomplete EMR may produce sub-mucosal fibrosis that makes future EMR technically difficult.

### *For Future Research*

It would be helpful to pinpoint which

elements in a training course provide the largest impact on recurrence rates after EMR. Future research might focus on comparing e-learning modules to hands-on training sessions. At a minimum, specific aspects of hands-on training and learning modules should be described sufficiently to facilitate dissemination of these educational tools.

### *Conflict of Interest*

Dr. Abu-Heija reports no potential conflicts of interest.

## REFERENCES

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