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Cold vs Hot Snare Resection of Large Polyps: A Cooler, Safer Approach for Large Colorectal Polyps

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This summary reviews Steinbrück I, Ebigbo A, Kuellmer A, et al. Cold versus hot snare endoscopic resection of large nonpedunculated colorectal polyps: Randomized controlled German CHRONICLE trial. Gastroenterology. 2024 Sep;167(4):764-777.

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STRUCTURED ABSTRACT

Question: Does cold snare endoscopic mucosal resection (EMR) offer a safer and equally effective alternative to hot snare EMR for large (≥2 cm), nonpedunculated colorectal polyps (LNPCPs)?

Design: Randomized controlled multicenter trial comparing cold snare EMR with hot snare EMR, using a 1:1 randomization ratio with concealment of allocation and blinding of patients to treatment group.

Setting: Conducted at 19 tertiary referral centers in Germany between 2021 and 2023.

Patients: A total of 363 patients with 396 large, nonpedunculated colorectal polyps (≥2 cm) were included. Exclusion criteria included pedunculated polyps, residual/recurrent polyps, suspected malignancies, polyps with large nodules (>1-1.5 cm), antiplatelet/anticoagulant use that could not be held, or contraindications to treatment.

Intervention: Patients were randomly assigned to either cold snare EMR or hot snare EMR. Both groups adhered to standard procedural guidelines using piecemeal resection. Cold snare EMR avoided thermal injury by using mechanical-only resection. Normal saline, with or without staining liquids (e.g., indigo carmine) and/or diluted 1:10,000 adrenaline, was used for EMR.

Outcomes: Primary outcome was major adverse events (AEs), including perforation and postprocedural bleeding. Secondary outcomes were intraprocedural bleeding, residual/recurrent adenoma rates at follow-up, postpolypectomy syndrome, resection speed, and technical success rates. A standardized telephone interview was conducted 4 weeks after the procedure to assess for AEs and repeat colonoscopy to assess for residual adenoma after piecemeal resection was performed 4 (+/-2) months after index polypectomy.

Data Analysis: Statistical comparisons were made using intention-to-treat (ITT) and per-protocol (PP) analyses. ITT included all randomized patients. PP excluded cases in which allocated intervention was not carried out as planned (conversion of resection technique or other protocol violation).

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Results: Among the 363 study patients, mean age was 66, male-52%, and histology determined that 46% adenomas with low-grade dysplasia and 35% were sessile serrated lesions (SSLs) or hyperplastic polyps. Cold resection was converted to hot in 14 cases. Cold EMR showed a slightly lower success rate than hot EMR (92.2% vs 97.5%; $P = 0.022$). En bloc resection was higher in the hot EMR group (2.1% vs 8.4%; $P < 0.001$). However, polyps were resected in more than 5 pieces at a higher rate in cold EMR (68.9% vs 45.8%; $P < 0.001$). There was no significant difference in resection speed.

Cold snare EMR had significantly fewer major AEs (1.0% vs 7.9%; $P = 0.001$). (Figure 1) No perforations occurred in the cold group, compared to 3.9% in the hot group. Postprocedural bleeding rate was also lower in the cold EMR group (1.0% vs 4.4%; $P = 0.04$). The only predictor for major AEs was polyp diameter ≥4 cm (odds ratio [OR], 3.37). Higher rates of residual/recurrent adenoma in cold EMR (23.7% vs 13.8%; $P = 0.020$). (Figure 1) Predictors of residual/recurrent adenoma were large lesions ≥4 cm (OR, 2.47; 95% confidence intervals [CI]: 1.25-9.09) and high-grade dysplasia/carcinoma (OR, 2.92; 95% CI: 1.22-7.00). Post-hoc analysis showed similar rates of residual neoplasia for SSL in the cold vs hot group (8.3% vs 4.8%; $P = 0.681$) and for laterally spreading tumors, while only the nodular-mixed type had significantly different rate of residual adenoma (40.5% vs 14.3%; $P = 0.011$).

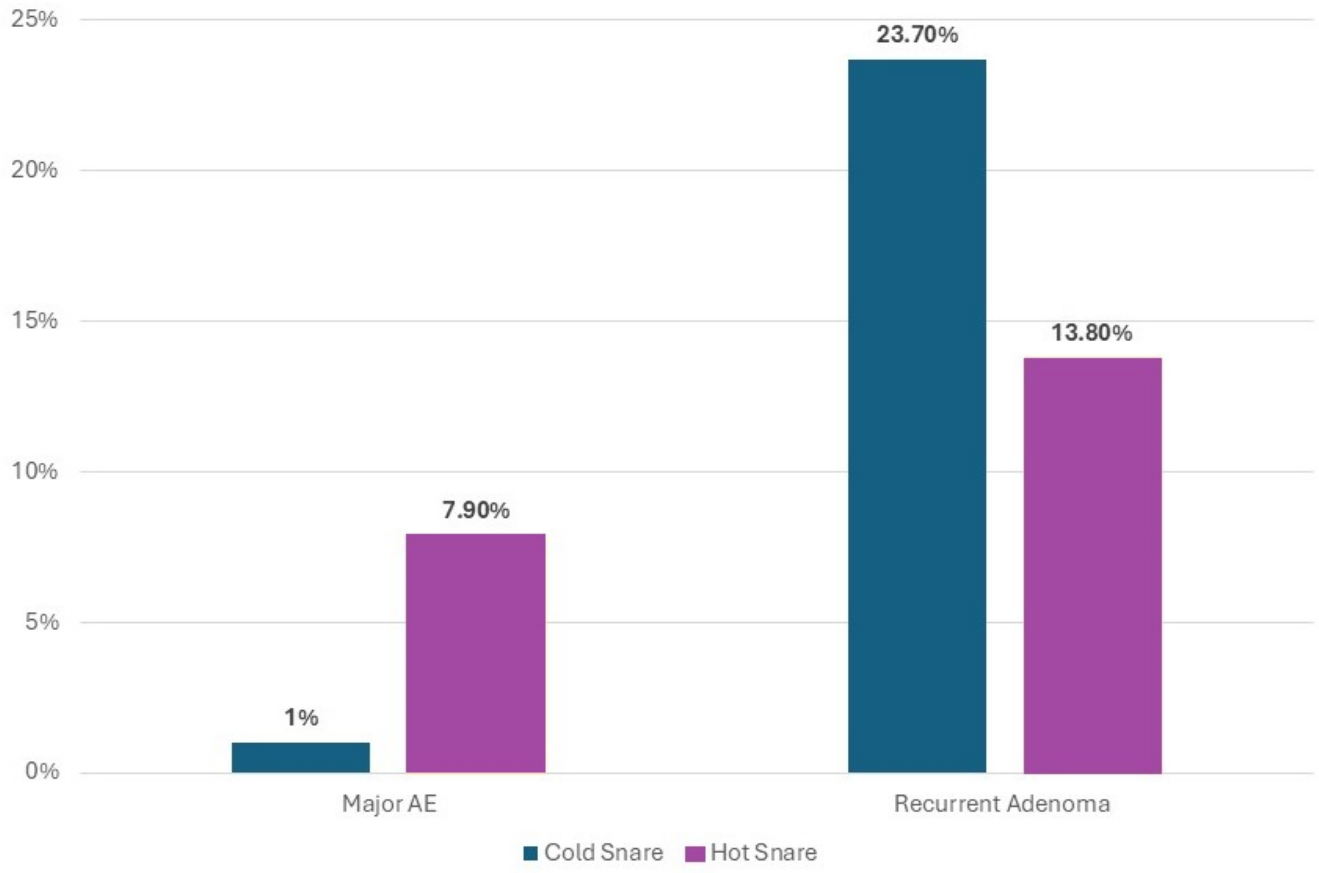

Figure 1. Rates of major adverse events (AE) and residual/recurrent adenoma in cold snare vs hot snare endoscopic mucosal resection groups.

COMMENTARY

Why Is This Important?

EMR is considered safe and effective for resecting LNPCPs ≥ 20 mm. However, there is limited evidence from prospective trials comparing safety and recurrence with cold snare EMR vs hot snare EMR. This is the first RCT comparing cold and hot snare EMR of LNPCPs ≥ 20 mm. Albeit, since publishing in Sept 2024 an RCT was published in Oct 2024 by O'Sullivan et al comparing cold vs hot snare EMR for flat NPCP ≥ 15 mm with similar results.[1] Given the frequency at which LNPCPs are encountered during colonoscopy more evidence is crucial to allow for appropriate decision making upon encountering such lesions.

Key Study Findings

Cold snare EMR is significantly safer than hot snare EMR for large (≥ 2cm) non-pedunculated polyps with a reduction of major AEs by >85% (7.9% to 1.0%).

No perforations were reported in cold resection compared to 8 cases in hot resection (0% vs 3.9%) and post-polypectomy bleeding was also significantly less frequent (1.0% vs 4.4%). The differences are both statistically significant and clinically relevant, especially when considering associated sequalae of such AEs including additional interventions and often patient admission with long hospital stays. Unfortunately, the substantial reduction in AEs by cold resection is accompanied by a higher rate of residual/recurrent adenoma (23.7% vs. 13.8%). This study did not include systematic margin coagulation of polypectomy site which have been shown to reduce residual/recurrence to <5%-10%.[2] Fortunately, residual adenoma at follow up is usually small in size and easy to treat but does expose patients to the risk of repeated colonoscopies.

Caution

Although endoscopists could not be blinded to treatment assignment (cold snare vs hot snare), patients were definitely blinded, and it appears that adjudicators of adverse events and endoscopists performing follow-up colonoscopy were blinded. There may be some variability in the performance of polypectomy among endoscopists that could not be fully captured by the reported data. Although there is no significant difference in residual/recurrence in SSLs, this may reflect an overall low number of SSLs and there was a strong numerical trend for higher rates of residual SSL when cold snare was performed.

My Practice

This study supports my practice of largely performing cold snare EMR for LNPCPs ≥20 mm considering the safety profile of the resection and ability to deal with residual/recurrence on follow up colonoscopies. Per my prior commentary[3], piecemeal cold snare of LNPCPs can be technically difficult, so

optimizing procedure volume may help minimize recurrence. Since my schedule includes extended endoscopy slots for complex EMR, my colleagues frequently refer patients with LNPCPs. Before I do any injection, I carefully identify the margins of the polyp using zoom focus, high-definition white light, and NBI. This is crucial to facilitate identification of residual tissue both centrally and at polyp margins after beginning resection. I mix epinephrine with a colloid injection fluid to lift LNPCPs, which is important to minimize bleeding when doing piecemeal cold snare, and I also routinely use soft-tip coagulation for thermal ablation of polyp margins to minimize recurrence.

Since my colleagues are referring patients with LNPCPs to me for complex EMR, I also ask them to inject dye 2 folds distal (i.e. closer to the rectum) from the lesion to facilitate polyp location on repeat colonoscopy and to avoid doing anything more than obtaining a pinch biopsy. This is preferable to initiating EMR, but failing to complete it, since incomplete EMR may produce sub-mucosal fibrosis that makes future EMR technically difficult.

For Future Research

Future work focused on technical developments to reduce recurrence and improve outcomes is vital. Studies comparing cold vs hot resection of different lesion morphologies and pathology can further advance our technique to allow for combining the safety of cold snare resection with lower residual/recurrence of hot snare EMR.

Conflict of Interest

Dr. Abu-Heija reports no potential conflicts of interest for this summary.

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