

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

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Background: The optimal technique for removal of diminutive or small colorectal polyps is debatable.

Objective: To compare the complete resection rates of cold snare polypectomy (CSP) and cold forceps polypectomy (CFP) for the removal of adenomatous polyps ≤ 7 mm.

Design: Prospective randomized controlled study.

Setting: A university hospital.

Patients: A total of 139 patients who were found to have ≥ 1 colorectal adenomatous polyps ≤ 7 mm.

Interventions: Polyps were randomized to be treated with either CSP or CFP. After the initial polypectomy, additional EMR was performed at the polypectomy site to assess the presence of residual polyp tissue.

Main Outcome Measurements: Absence of residual polyp tissue in the EMR specimen of the polypectomy site was defined as complete resection.

Results: Among a total of 145 polyps, 128 (88.3%) were adenomatous polyps. The overall complete resection rate for adenomatous polyps was significantly higher in the CSP group compared with the CFP group (57/59, 96.6% vs 57/69, 82.6%; $P = .011$). Although the complete resection rates for adenomatous polyps ≤ 4 mm were not different (27/27, 100% vs 31/32, 96.9%; $P = 1.000$), the complete resection rates for adenomatous polyps sized 5 to 7 mm was significantly higher in the CSP group compared with the CFP group (30/32, 93.8% vs 26/37, 70.3%; $P = .013$).

Limitations: Single-center study.

Conclusion: CSP is recommended for the complete resection of colorectal adenomatous polyps ≤ 7 mm. (Clinical trial registration number: NCT01665898.) (Gastrointest Endosc 2015;81:741-7.)

Abbreviations: CFP, cold forceps polypectomy; CSP, cold snare polypectomy.

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Colonoscopy is one of the primary screening tests for colorectal cancer because polypectomy during colonoscopy allows for the removal of precursor lesions that may progress to cancer. The majority of polyps found during colonoscopy are <1 cm in size, and the majority of these polyps are ≤ 5 mm.¹ When neoplastic, most of these small (6-9 mm) and diminutive (1-5 mm) polyps have tubular histology with low-grade dysplasia.²

The polypectomy technique for diminutive and small polyps is highly variable among endoscopists.³ Current techniques include snare and forceps with or without electrocautery. A survey of endoscopists found cold forceps polypectomy (CFP) as the technique of choice for polyps measuring ≤ 6 mm.³⁻⁵ However, the optimal technique for removing diminutive and small polyps should be directed toward complete polyp removal. A goal of complete resection of all neoplastic polyps should be maintained, because 8.8% to 50.0% of interval colorectal cancer may be related to incomplete polypectomy.⁶⁻¹¹ In addition, the risk of removal of small and diminutive polyps should be minimized, because these polyps possess relatively low risks for progression to colorectal cancer.

Cold snare polypectomy (CSP) has been shown to be safe and effective for the removal of polyps ≤ 7 mm in size and is regarded as the ideal procedure for removal of small polyps.^{12,13} However, there have been no randomized controlled trials demonstrating complete resection rate by CSP or CFP for diminutive and small polyps. There are a paucity of data regarding which polypectomy technique is recommended according to polyp size. Therefore, this study was performed to compare the efficacy and safety of CSP to CFP in the removal of polyps ≤ 7 mm in size.

METHODS

The study was approved by the institutional review board at the Catholic University of Korea and registered with ClinicalTrials.gov (NCT01665898). Written informed consent for this study was obtained from all patients. The study concept, hypothesis, and design were all created by the investigator.

Study design

The study was a single-center, prospective, randomized controlled study involving outpatients who underwent a colonoscopy from January 2012 to July 2014. Inclusion criteria included patients aged >40 years who underwent a screening, surveillance, or diagnostic colonoscopy and were subsequently found to have small colorectal polyps measuring ≤ 7 mm in size. Exclusion criteria included patients with a bleeding tendency or those who had taken antiplatelet or anticoagulation therapy within 1 week before undergoing the procedure. Patients with inflammatory bowel disease, polyposis syndrome, or an inability to

provide informed consent were excluded. Patients were randomly assigned to either the CSP or CFP technique. If a patient had >1 eligible polyp, it was agreed on that a maximum of 2 were permitted to be included in the study.

Procedure

Bowel preparation consisted of patients drinking a total of 4 L of polyethylene glycol solution before their procedures. Total colonoscopies were prospectively performed by using a high-definition endoscope (CF-H260AL; Olympus Co, Tokyo, Japan) by 3 highly experienced endoscopists (B.I.L., J.S.K., H.C.). All polyps found during colonoscopy were photographed, and their characteristics, including size and anatomic location, were documented. Polyps that were deemed neoplastic (vessels surrounding oval, tubular, or branched pits under observation by high-definition white-light endoscopy and narrow-band imaging endoscopy) were subjected to polypectomy.¹⁴ Polyp size was defined by using the opening width of the biopsy forceps. If the size of the polyp was eligible for the study (≤ 7 mm), polypectomy was performed by one of two randomized methods. Afterward, additional EMR was performed at the polypectomy site to evaluate for the presence of residual polyp tissue. After each procedure, the polypectomy site was observed for 30 seconds to confirm the absence of immediate bleeding.

CSP was performed by using a disposable oval snare with a diameter of 10 mm (SD-210U-10; Olympus) under gentle suction to reduce colon wall tension. The tip of the endoscope was deflected toward the polyp base to ensnare 1 to 2 mm of normal mucosa surrounding the polyp. CFP was performed by using biopsy forceps with an ellipsoid cup and needle (FB-24U-1; Olympus). Forceps bites were repeatedly taken until the polyp was thought to be removed on endoscopy. The number of forceps bites was not limited. The procedure time taken for each polypectomy was measured from identification of the polyp to completion of polypectomy by photographic documentation.

After each procedure, the specimens were retrieved and stored in formalin. For histologic assessment of residual polyp tissues, the polypectomy site, including an additional 1 to 2 mm clear margin, was resected by the snare and Endocut current (VIO300D; Erbe Elektromedizin GmbH, Tubingen, Germany) after submucosal injection of a mixed solution (normal saline solution + 0.01% epinephrine).

The retrieved specimen was fixed on a plate by using pins. After indigo carmine solution was applied, the specimen was studied under a stereomicroscope with 8-power magnification to assess the presence of residual tissue by the endoscopist who performed the polypectomy. The presence of residual tissue was documented, and the plate was marked with a pen to indicate the most probable site of residual tissue. Cross-sections of the EMR specimens were collected at 1-mm intervals; accurate tissue section of the marked site was ensured. All tissue samples

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