

## Increased Risk of Metachronous Neoplasia After Incomplete Polyp Resection – Time to CARE About Polypectomy Technique!



Jeffrey Lee, MD, MPH

*Research Scientist and Attending Gastroenterologist, Department of Gastroenterology, Kaiser Permanente San Francisco Medical Center, California.*

This article reviews: Pohl H, Anderson JC, Aguilera-Fish A, Calderwood AH, Mackenzie TA, Robertson DJ. Recurrence of Colorectal Neoplastic Polyps After Incomplete Resection. *Ann Intern Med.* 2021;174(10):1377-1384. <https://pubmed.ncbi.nlm.nih.gov/34370514/>

Correspondence to Jeffrey Lee, MD, MPH, Associate Editor. Email: [EBGI@gi.org](mailto:EBGI@gi.org)

Jeffrey Lee, MD, MPH  
Associate Editor

### STRUCTURED ABSTRACT

**Question:** Does incomplete polyp resection increase your future risk of developing metachronous neoplasia?

**Design:** Observational cohort study of patients who participated in the Complete Adenoma Resection (CARE) study<sup>1</sup> and received a colonoscopy for colon polyp surveillance. In the CARE study, 233 patients with a total of 349 5-20 mm nonpedunculated polyps were removed by electrocautery (“hot”) snare resection. After complete resection, cold forceps biopsies of resection margins were obtained, and polypectomy was defined as incomplete if resection margin biopsies showed adenomatous tissue. Overall, incomplete resection occurred in 10.1% and was significantly higher for large (10-20mm) neoplastic polyps vs small (5-9mm) neoplastic polyps (17.3% vs 6.8%) and for sessile serrated polyps/adenomas vs conventional adenomas (31.0% vs 7.2%). If incomplete resection, the patient was advised to get repeat colonoscopy within 1 year. If complete resection, then repeat colonoscopy recommended per guidelines.

**Setting:** Two US-based academic medical centers: Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire and VA Medical Center, White River Junction, Vermont.

**Patients:** Of the 233 original study patients, 166 patients received a follow-up surveillance colonoscopy. The mean age of the study cohort was 62.8 years; 82.5% were men; 19.3% had history of incomplete resection (median time to surveillance colonoscopy of 17 months) and 80.7% had history of complete resection (median time to surveillance colonoscopy of 45 months).

**Exposure/Intervention:** Surveillance colonoscopy of original CARE study patients, which was performed at 1-year if incomplete resection or performed consistent with guideline recommendations if all polyps were completely resected.

**Outcome:** Proportion of colon segments with metachronous neoplasia at first surveillance colonoscopy. Colon segments were defined as cecum, ascending colon including hepatic flexure, transverse colon, descending colon including splenic flexure, sigmoid colon, and rectum. “Metachronous neoplasia” means that a conventional adenoma or a sessile serrated polyp/adenoma was found in a specific segment of colon on the surveillance colonoscopy.

**Results:** Metachronous neoplasia was more frequently detected in colon segments where incomplete resection was previously reported compared to colon segments with complete polyp resection (52% vs 23%; risk difference, 28% [95% Confidence Interval: 9% - 47%,  $P=0.004$ ]). In addition, metachronous advanced neoplasia was more frequently detected in colon segments with prior incomplete polyp resection compared to those with complete polyp resection (18% vs 3%; risk difference 15% [95% Confidence Interval 1% - 29%,  $P=0.034$ ]). Incomplete resection was the strongest independent factor associated with metachronous neoplasia.

**Funding:** None

## COMMENTARY

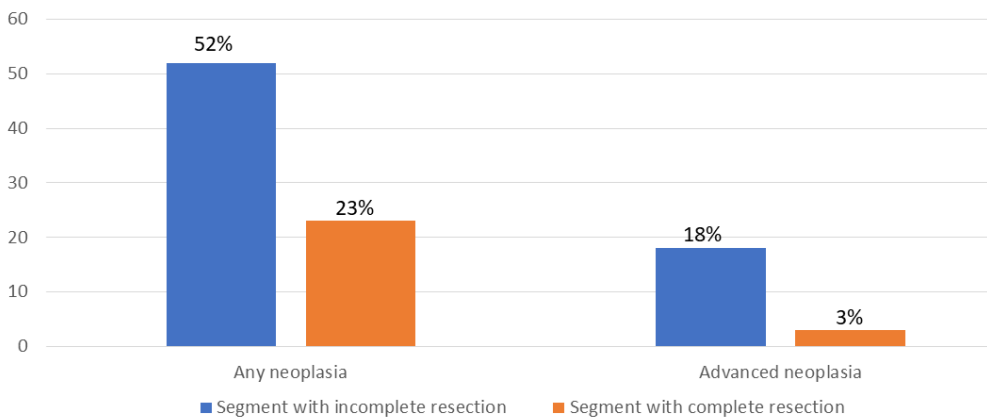
### *Why Is This Important?*

The prevalence of post-colonoscopy colorectal cancer is estimated to be around 8% (i.e., about 8% of colorectal cancers occur in individuals who had colonoscopy greater than 6 months but less than 3 years before CRC diagnosis).<sup>2</sup> Given this alarming statistic, gastroenterologists have explored potential factors, particularly modifiable, contributing to this devastating diagnosis. Although missed lesions are an important driver of post-colonoscopy colorectal cancer,<sup>3</sup> others have speculated whether the quality of

resection may also be a contributor to this diagnosis. Recent studies have suggested that the quality of resection is variable across experienced gastroenterologists.<sup>1,4</sup> This study expands on prior literature and uses a well-done prospective observational cohort study design to assess the impact of incomplete polyp resection on recurrent neoplasia.<sup>5</sup>

### **Key Study Findings**

Patients with incomplete resection of neoplastic polyps 5-20 mm in size were at higher risk for more metachronous neoplasia (52% vs 23%,  $P=0.004$ ) and advanced neoplasia (18% vs 3%,  $P=0.034$ ) compared to patients who had a complete resection (**Figure 1**). All cases of metachronous advanced neoplasia among patients with incomplete resection were due to polyp size (i.e., 10 mm or greater) and not advanced histologic characteristics. The strongest predictor of metachronous neoplasia on follow-up surveillance was incomplete polyp resection (adjusted odds ratio 3.02; 95% confidence interval 1.12-8.17).



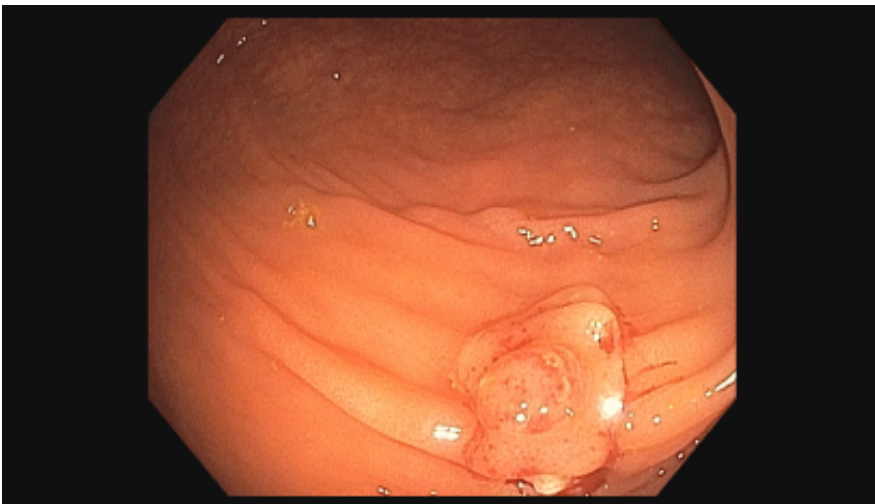
**Figure 1.** Risk of Metachronous Neoplasia at Surveillance Colonoscopy Following Polypectomy.

### **Caution**

Potential selection bias due to incomplete follow-up of all patients who had incomplete polyp resection. In addition, patients with incomplete polyp resection may have been examined more thoroughly on surveillance compared to patients with complete polyp resection, which may increase the chance of identifying a polyp or an advanced polyp.

### *My Practice*

My approach for the removal of non-pedunculated polyps 5-20 mm varies based on the pathology (diagnosed optically) and size. For all polyps, regardless of its size, I first start with a careful inspection to optically diagnose the lesion and identify any features of deep submucosal invasion. Once I have made the decision to resect the polyp, I ensure that the lesion is at the 5 or 6 o'clock position so that I can have optimal positioning and accurate placement of my instruments. For serrated polyps (e.g., sessile serrated lesions) and conventional adenomas <10 mm in size, I prefer using a dedicated cold snare (e.g., Boston Scientific Captivator Cold, Steris Exacto Cold Snare) for its removal; multiple randomized trials have shown that cold snare polypectomy is superior in terms of complete resection rates compared to cold forceps polypectomy.<sup>6,7</sup> To help ensure complete resection, I like to take a rim of normal tissue when I remove these polyps, which will occasionally give a "sunny-side up" appearance of the resected lesion (**Figure 2**). I think it's essential to remove this rim of normal tissue during cold snare polypectomy to ensure the lesion is completely resected.



**Figure 2.** Removal of the rim of normal tissue can lead to a "sunny-side up" appearance.

For serrated polyps and conventional adenomas 10-20 mm in size, I typically use either a conventional or underwater endoscopic mucosal resection (EMR) technique to remove these lesions. For both EMR techniques, I prefer to use a 15-20 mm stiff snare (e.g., Boston Scientific

Captivator II, Olympus Snaremaster) and a cutting current with a microprocessor-controlled current delivery (Erbe VIO 300D EndoCut Q; Erbe, Tübingen, Germany). For conventional EMR, I often use a lifting agent (e.g., hetastarch mixed with a contrast agent) to help delineate the borders and reduce the risk of perforation and thermal injury. Like polyps <10 mm in size, I strive to resect medium sized polyps (10-20 mm) en-bloc while capturing a rim of normal tissue to ensure complete resection. Although, there's limited evidence on the best approach to remove medium sized non-pedunculated polyps, one general rule is to avoid using cold forceps to piecemeal resect these lesions due to the risk of leaving residual neoplastic tissue. In fact, I do not use cold forceps for polypectomy unless the polyp is less than 3 mm in diameter.

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

More data is needed to determine the impact of improved polypectomy technique on the risk of post-colonoscopy colorectal cancer. In addition, more research is needed to develop and evaluate polypectomy training tools during and following gastroenterology fellowship.

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

Dr. Lee reports no potential conflicts of interest.

### **REFERENCES**

1. Pohl H, Srivastava A, Bensen SP, Anderson P, Rothstein RI, Gordon SR, Levy LC, Toor A, Mackenzie TA, Rosch T, Robertson DJ. Incomplete polyp resection during colonoscopy-results of the complete adenoma resection (CARE) study. *Gastroenterology* 2013 Jan;144(1):74-80.e1. Erratum in: *Gastroenterology*. 2021 Oct;161(4):1347.
2. Kang JH, Evans N, Singh S, Samadder NJ, Lee JK. Systematic review with meta-analysis: the prevalence of post-colonoscopy colorectal cancers using the World Endoscopy Organization nomenclature. *Aliment Pharmacol Ther* 2021 Nov;54(10):1232-1242.
3. Anderson R, Burr NE, Valori R. Causes of Post-Colonoscopy Colorectal Cancers Based on World Endoscopy Organization System of Analysis. *Gastroenterology* 2020 Apr;158(5):1287-1299.e2.
4. Duloy AM, Kaltenbach TR, Keswani RN. Assessing colon polypectomy competency and its association with established quality metrics. *Gastrointest Endosc* 2018 Mar;87(3):635-644.

5. Pohl H, Anderson JC, Aguilera-Fish A, Calderwood AH, Mackenzie TA, Robertson DJ. Recurrence of Colorectal Neoplastic Polyps After Incomplete Resection. *Ann Intern Med* 2021; 174(10):1377-1384.
6. Kim JS, Lee B-I, Choi H, et al. Cold snare polypectomy versus cold forceps polypectomy for diminutive and small colorectal polyps: a randomized controlled trial. *Gastrointest Endosc* 2015;81:741-7.
7. Jung YS, Park CH, Nam E, Eun CS, Park DI, Han DS. Comparative efficacy of cold polypectomy techniques for diminutive colorectal polyps: a systematic review and network meta-analysis. *Surg Endosc*. 2018 Mar;32(3):1149-1159.