

How to Manage Crohn's Disease After Ileocolonic Resection?



Herbert Tilg¹ and Geert D'Haens²

¹Department of Internal Medicine I, Gastroenterology, Hepatology, Metabolism & Endocrinology, Medical University Innsbruck, Innsbruck, Austria; and ²Department of Gastroenterology and Hepatology, Amsterdam University Medical Centre, Academic Medical Centre, Amsterdam, Netherlands



Despite recent advances in the medical management of Crohn's disease (CD), a substantial proportion of patients cannot avoid surgery, most often ileocolonic resection. Unfortunately, the disease frequently recurs at the anastomosis and in the neoterminal ileum

proximally to it.¹ Rutgeerts and colleagues demonstrated that such recurrence is dependent on the presence of fecal content.² None of 5 patients receiving a diverting ileostomy proximal to the anastomosis exhibited any endoscopic lesions six months after diversion, whereas 70% of patients with one-step surgery showed endoscopic recurrence at the same time point. D'Haens and colleagues reported that intestinal content induced histological inflammation in the neoterminal ileum already in the very first days after surgery.³ The pathophysiology of this phenomenon remains a mystery until today. Besides dietary components and various metabolites the gut microbiota has been considered a likely culprit, since endoscopic recurrence has been associated with profound changes in ileal mucosa-associated microbiota.⁴ In this article we will discuss the management of Crohn's patients after surgery, especially after ileocolonic resection.

Incidence and Risk Factors for Postoperative Recurrence

Crohn's disease can recur rapidly and presents as histological ± endoscopic ± clinical recurrence in the neoterminal ileum.¹⁻³ Certain risk factors contribute to the likelihood and severity of recurrence. Clinical recurrence rates amount to 20-35% after 1 year and 34%-86% after 3 years, depending on the patient population.^{5,6} Typical symptoms of recurrence include diarrhea and abdominal pain, although various other differential diagnoses such as bile salt malabsorption and irritable bowel syndrome have to be considered. A subgroup of patients develops stenosis and will need endoscopic dilatation and/or a second surgery. Surgical recurrence, i.e. the need for repeated surgery occurs in around 25% after 5 years and 35% after 10 years, especially before 1980.⁷ These rates have diminished considerably in the last 1-2 decades, probably as a

consequence of the use of earlier and more potent anti-inflammatory treatments.⁸

Endoscopic recurrence usually precedes clinical symptoms

For the assessment of endoscopic recurrence the Rutgeerts score was developed⁵ (Figure 1). Six months endoscopic recurrence rates have been around 70%² and 12 months rates between 73%⁵ and >90%⁹, with approximately 50% having 'severe' recurrence (Rutgeerts score ≥ 2) based on a meta-analysis.¹⁰ Early intervention studies e.g. using metronidazole have even shown endoscopic recurrence rates up to 75% as early as 12 weeks postoperatively.¹¹

Several risk factors associated with higher likelihood of CD recurrence have been identified. The presence of one or more of such risk factors should guide the intensity of postoperative follow-up (Table 1). One of the most important risk factors is smoking.^{12,13} Therefore, all medical and psychological efforts have to be taken to convince patients to quit smoking. A shorter disease duration (< 2 years) at surgery also increases the risk for recurrence.¹⁴ Other relevant risk factors include prior resections, fistulizing/penetrating disease as surgical indication, extensive bowel disease (> 50 cm), upper gastrointestinal involvement, male gender, granulomas in the resection specimen, histological inflammation at the ileal and possibly colonic margins.¹⁵⁻²⁰ Myenteric plexitis has not been reproduced as a risk factor.¹⁵⁻²¹ So far, no genetic factors have been identified. At the level of the microbiome, lack of significant concentrations of *Faecalibacterium prausnitzii* in the ileal mucosa has been associated with higher recurrence rates.⁴

Non-Inflammatory Causes of Diarrhea After Surgical Resection

Diarrhea after ileocolonic resection is common. Besides CD recurrence, bile acid-induced diarrhea (observed in up to 80% of subjects, often transient²²) needs to be considered. Especially with low fecal calprotectin (FC) levels a therapeutic trial of bile acid sequestrants is recommended (cholestyramine, colestipol or colesevelam depending on

Most current article

© 2020 by the AGA Institute
0016-5085/\$36.00

<https://doi.org/10.1053/j.gastro.2020.06.005>

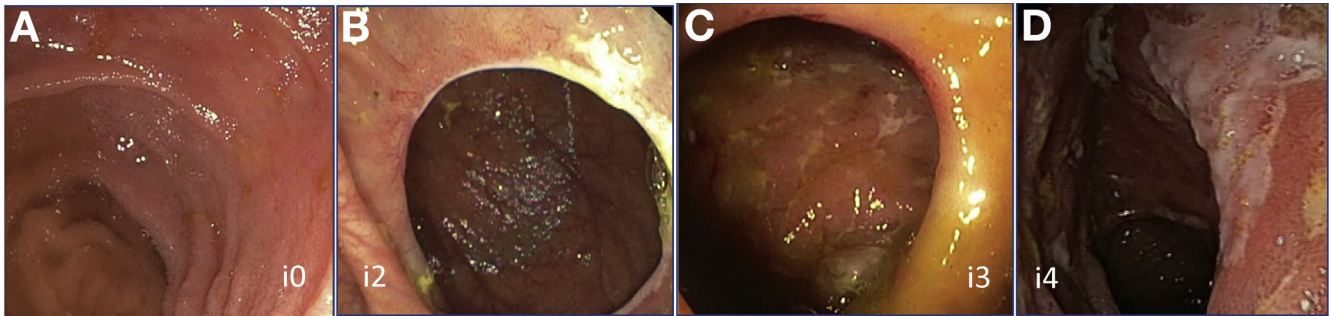


Figure 1. Endoscopic postoperative recurrence score (Rutgeerts score). i0: no lesions, normal neo-terminal ileum and anastomosis; i1: < 5 aphthous ulcers in the neo-terminal ileum; i2: > 5 aphthous ulcers in the neo-terminal ileum with mostly normal mucosa or lesions confined to the ileocolonic anastomosis; i3: diffuse aphthous ileitis and diffusely inflamed mucosa; i4: diffuse inflammation with large ulcers, nodules and/or narrowing: (A) i0 lesion; (B), i2 lesion; (C) i3 lesion and (D) i4 lesion

availability and tolerability); furthermore, loperamide can also be used safely. Another potential differential diagnosis in case of diarrhea, bloating, nausea or vomiting, and weight loss is small intestinal bacterial overgrowth²³, which²⁴ is more likely in case of blind loops, diverticula and adhesions. Although glucose breath test can be performed to support this diagnosis, an empiric antibiotic therapy can be considered. Other potential confounders include irritable bowel syndrome and surgical complications (e.g. strictures, adhesions) or hernia development. Hence, an open-minded and systematic approach is crucial. A small proportion of patients will also suffer from chronic abdominal pain, usually caused by a combination of the problems outlined above. Chronic analgesic treatment even with amitriptyline or neurotropic analgesics may be worth trying.

How to Follow a Patient After Ileocolonic Resection?

Considering the high incidence and rapid evolution of CD postoperative recurrence, systematic follow-up seems reasonable. The established 'Gold standard' is ileocolonoscopy, usually recommended 6-12 months after resection. Patients with a more aggressive disease phenotype or those who had multiple resections may be considered for earlier evaluation (e.g. after 3-4 months). Alternatively, both MR enterography²⁵ and small bowel sonography²⁶ show good correlations with endoscopical findings. In addition, fecal biomarkers such as FC offers an attractive monitoring tool. Wright and colleagues observed that FC >100 $\mu\text{g/g}$ indicated endoscopic recurrence with 89% sensitivity and 58% specificity; importantly, FC was superior to serum C-reactive protein and clinical assessment by CDAI.²⁷ FC

levels < 51 $\mu\text{g/g}$ predicted maintenance of remission at 18 months. In another study FC levels >100 $\mu\text{g/g}$ correlated well with endoscopic recurrence and allowed to avoid 30% of ileocolonoscopies.²⁸ In the TOPPIC trial FC >100 $\mu\text{g/g}$ was associated with a 18% higher likelihood of clinical recurrence.²⁹ Therefore, serial measurements of FC e.g. 3-monthly could offer a personalized strategy allowing more optimal timing of ileocolonoscopy (Figure 2).

Medical Prophylaxis: Whom, When and How To Treat?

Micobiota-targeted interventions

Nitroimidazol antibiotics are the best studied antibacterial agents in Crohn's disease following resection. Rutgeerts et al. randomized 60 patients after ileocolonic resection to 20 mg/kg body weight metronidazole or placebo (PLC) for 12 weeks.¹¹ Metronidazol decreased endoscopic recurrence and delayed onset of clinical relapse. Ornidazole 1g/day significantly reduced endoscopic and clinical recurrence after 1 year.³⁰ Unfortunately these antibiotics are not well tolerated with approximately 25% of patients developing (dose-dependently) metallic taste, nausea and neuropathic complications. Shorter treatments (e.g. limited to 3 months) are better tolerated as demonstrated in several trials.^{31,32} Other antibiotics such as ciprofloxacin were not efficacious in this indication.³³ Rifaximin is usually well tolerated but no studies with this agent in the postoperative setting have been reported. Also, enteral administration of *F. prausnitzii* may offer an attractive treatment strategy.

Aminosalicylates

A meta-analysis of 11 RCTs using aminosalicylates to prevent postoperative recurrence revealed that sulfasalazine offered no benefit and mesalamine reduced the recurrence risk by approximately 20% (NNT=10). Given this modest effect, this class of drugs is not routinely recommended to prevent postoperative recurrence.³⁴

Thiopurines

A recent Cochrane analysis showed a decrease in clinical but not endoscopic recurrence with thiopurines.³⁵ Favorable evidence came from the TOPPIC trial where postoperative patients received up to 3 years of 6-mercaptopurine (n=128) or placebo (PLC) (n=112).²⁹ However, only active smokers had a modest benefit of this

Table 1. Risk factors for disease recurrence

- Smoking
- Shorter disease duration (< 2 years)
- Prior resections
- Fistulizing/penetrating disease
- Extensive bowel involvement (> 50 cm)
- Upper gastrointestinal involvement
- Male gender
- Granulomas in the resection specimen
- Myenteric plexitis (unconfirmed)
- Transmural lesions at the ileal (and possibly colonic) margins

MENTORING, EDUCATION, AND TRAINING CORNER

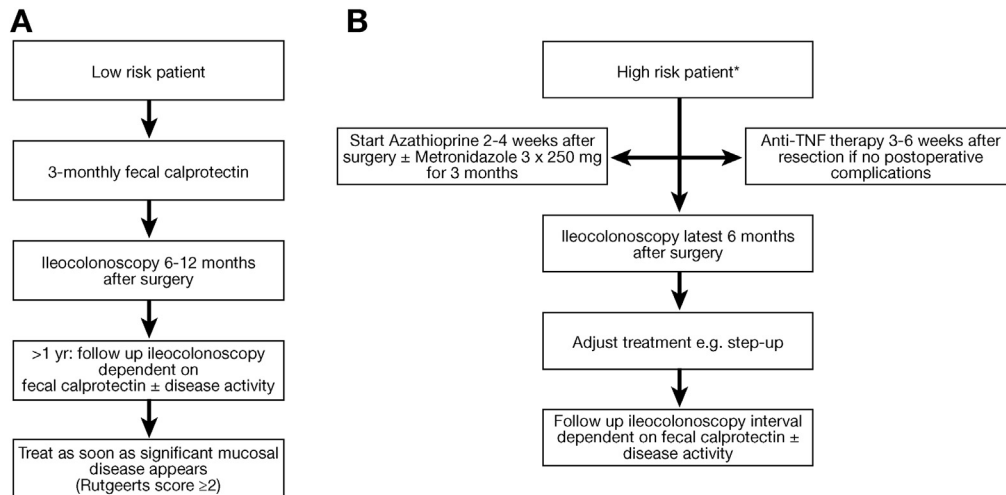


Figure 2. Proposed algorithm for management of CD after ileocolonic resection. Panel A describes algorithm in low risk and Panel B in high risk patients. Majority of patients will need management as proposed in panel B. Either azathioprine or an anti-TNF therapy can be chosen in high risk patients. * high risk if: smoker, younger patients <30 years, repeated surgeries, disease duration < 2 years, perforating/fistulizing/long segment involvement of disease (> 50 cm), upper gastrointestinal involvement, male gender and transmural lesions at the ileal margin (see also full text). Abbreviations: FC, fecal calprotectin

therapy. In an earlier trial, 6-mercaptopurine (50 mg daily) for 2 years prevented postoperative recurrence more efficiently than mesalamine and PLC.³⁶ The potential benefit of azathioprine therapy may be increased by concomitant metronidazole in the first 3 months.³¹ Hence, thiopurines can be considered in patients that have demonstrated good tolerability with a moderate recurrence risk.

Anti-TNF antibodies

The most promising agents for the postoperative patient studied so far have been anti-TNF agents. Early small studies with infliximab (IFX) showed a reduction in endoscopic and histologic postoperative recurrence rates after 1 year compared to PLC.³⁷ The larger PREVENT study with IFX (n=297, 76 weeks duration) demonstrated a significant reduction in endoscopic recurrence (30.6% on IFX vs 60% on PLC) but a non-significant reduction in clinical recurrences, which is why the drug did not receive FDA approval for 'prevention of postoperative recurrence'.³⁸ Potential long-term benefit was suggested in an open label IFX study over 5 years.³⁹ Importantly, patients who have received various anti-TNF drugs before surgery have a higher likelihood for recurrence despite continued anti-TNF therapy.⁴⁰

Adalimumab (ADL) was also effective in the postoperative setting in the POCER study.³² Here, patients received a 3-months course of metronidazole and high risk patients received either azathioprine or ADL in case of intolerance. In case of endoscopic recurrence (Rutgeerts score \geq i2) at 6 months treatment was escalated to ADL, from biweekly to weekly ADL or to ADL plus azathioprine. Patients randomized to colonoscopy at 6 months with step-up therapy as needed did better than those who did not (standard care) (18 months endoscopic recurrence 49% in the active group vs 67% in the standard care group), but clinical recurrence was not significantly different (27% versus 40%, p=0.08). This study did not answer the question whether an anti-TNF agent is more effective than azathioprine or combination therapy, although post-

hoc analysis suggested a stronger anti-inflammatory benefit with ADL. A Spanish study including 91 patients compared ADL every 2 weeks with azathioprine.⁴¹ Interestingly, ADL was not superior to azathioprine plus metronidazole in this unselected population after 1 year. In a smaller study (n=51) ADL was significantly more effective in reducing endoscopic and clinical recurrence compared to azathioprine and mesalamine.⁴² Overall, anti-TNF agents reduce endoscopic recurrence and to a certain extent also clinical recurrence; whether they are more effective than azathioprine and whether combination therapy with anti-TNF antibody plus azathioprine would be more effective is currently not known.

Other therapies

Corticosteroids and budesonide are ineffective to prevent postoperative recurrence. Data with newer therapies such as ustekinumab and vedolizumab have so far not been published. The REPREVIO trial with vedolizumab is currently recruiting (EUDRACT 2015-000555-24).

Our proposed approach to the postoperative patient

Medical prophylaxis is recommended in high risk patients as outlined before: smokers, younger patients (< 30 years), repeated surgeries, disease duration < 2 years and perforating/fistulizing/long segment involvement of disease (Figure 2). Treatment selection depends on prior efficacy and tolerability. Azathioprine started 2-4 weeks after surgery, preferentially combined with metronidazole 250 mg tid (for 12 weeks) is one potential option, but an anti-TNF inhibitor is certainly a valid alternative, to be started 3-6 weeks following resection (to allow time for potential postoperative complications to appear). Whatever treatment is initiated, it is recommended (as demonstrated in the POCER trial) to perform an endoscopy at the latest 6 months postoperatively and adjust the treatment based on the mucosal appearance.

In all other patients medical prophylaxis is not recommended and follow-up should be managed with serial assessment of FC and/or ileocolonoscopy at 6-12 months. Management beyond 1 year after surgery could also be based on this combination. Levels of FC can direct besides clinical symptoms the need for a next ileocolonoscopy, again, treatment is mandatory once significant mucosal disease has re-appeared even in the absence of symptoms.

Endoscopic dilatation

In case of a significant stenosis accompanied by clinical symptoms, endoscopic balloon dilatation is the preferred strategy before repeated surgery, if technically feasible. The largest series reported on 237 dilatations performed in 138 patients and showed long-term benefit after a median follow-up of 5.8 years, 46% of patients needed repeated dilatation versus 24% surgery.⁴³ The most optimal technique is probably to use through the scope hydrostatic balloons, which are inserted in the stenosis under visual guidance and inflated to 15-18 mm during 1-2 minutes. Repeat dilatation is usually guided by symptom recurrence; outcome is improved by upscaling medical treatment concurrently.⁴⁴

Ileocecal Resection as Therapeutic Intervention in Early Ileal Crohn's Disease

A recent prospective randomized trial demonstrated that patients with ileal CD (<40 cm) failing thiopurines benefit at least as much from laparoscopic ileocolonic resection as from step-up medical treatment to IFX. Recent follow-up data even revealed prolonged benefit without need for re-resection. Early ileocecal resection will probably be implemented in practice, but here, too, stringent postoperative monitoring is warranted.⁴⁵

Conclusions

Optimal follow-up and treatment of the postoperative Crohn's patient remains challenging. One of the reasons is that evidence from postoperative prevention trials is usually based on endoscopic findings, while the majority of patients remain asymptomatic. The dogma that endoscopic recurrence is predictive of further clinical disease is also based on a limited number of observational data. In the last decades substantial progress has been made in understanding the pathophysiology of Crohn's disease. The routine use of biomarkers such of FC has entered the clinical space. Despite the availability of potent anti-inflammatory drugs, optimal use of these agents remains challenging and their efficacy in the postoperative setting is disappointing. For now, we propose an algorithm outlined in [Figure 2](#). Hopefully, more effective therapies will become available in the future.

References

1. Homan WP, Dineen P. Comparison of the results of resection, bypass, and bypass with exclusion for ileocecal Crohn's disease. *Ann Surg* 1978;187:530-535.
2. Rutgeerts P, Geboes K, Peeters M, et al. Effect of faecal stream diversion on recurrence of Crohn's disease in the neoterminal ileum. *Lancet* 1991;338:771-774.
3. D'Haens GR, Geboes K, Peeters M, et al. Early lesions of recurrent Crohn's disease caused by infusion of intestinal contents in excluded ileum. *Gastroenterology* 1998;114:262-267.
4. Sokol H, Brot L, Stefanescu C, et al. Prominence of ileal mucosa-associated microbiota to predict postoperative endoscopic recurrence in Crohn's disease. *Gut* 2020;69:462-472.
5. Rutgeerts P, Geboes K, Vantrappen G, et al. Predictability of the postoperative course of Crohn's disease. *Gastroenterology* 1990;99:956-963.
6. Swoger JM, Regueiro M. Evaluation for postoperative recurrence of Crohn disease. *Gastroenterol Clin North Am* 2012;41:303-314.
7. Frolkis AD, Lipton DS, Fiest KM, et al. Cumulative incidence of second intestinal resection in Crohn's disease: a systematic review and meta-analysis of population-based studies. *Am J Gastroenterol* 2014;109:1739-1748.
8. Rungoe C, Langholz E, Andersson M, et al. Changes in medical treatment and surgery rates in inflammatory bowel disease: a nationwide cohort study 1979-2011. *Gut* 2014;63:1607-1616.
9. Olaison G, Smedh K, Sjodahl R. Natural course of Crohn's disease after ileocolic resection: endoscopically visualised ileal ulcers preceding symptoms. *Gut* 1992;33:331-335.
10. Renna S, Camma C, Modesto I, et al. Meta-analysis of the placebo rates of clinical relapse and severe endoscopic recurrence in postoperative Crohn's disease. *Gastroenterology* 2008;135:1500-1509.
11. Rutgeerts P, Hiele M, Geboes K, et al. Controlled trial of metronidazole treatment for prevention of Crohn's recurrence after ileal resection. *Gastroenterology* 1995;108:1617-1621.
12. Ryan WR, Allan RN, Yamamoto T, et al. Crohn's disease patients who quit smoking have a reduced risk of reoperation for recurrence. *Am J Surg* 2004;187:219-225.
13. Reese GE, Nanidis T, Borysiewicz C, et al. The effect of smoking after surgery for Crohn's disease: a meta-analysis of observational studies. *Int J Colorectal Dis* 2008;23:1213-1221.
14. Poggioli G, Laureti S, Selleri S, et al. Factors affecting recurrence in Crohn's disease. Results of a prospective audit. *Int J Colorectal Dis* 1996;11:294-298.
15. Hammoudi N, Cazals-Hatem D, Auzolle C, et al. Association Between Microscopic Lesions at Ileal Resection Margin and Recurrence After Surgery in Patients With Crohn's Disease. *Clin Gastroenterol Hepatol* 2020;18:141-149 e2.
16. Regueiro M, Velayos F, Greer JB, et al. American Gastroenterological Association Institute Technical Review on the Management of Crohn's Disease After Surgical Resection. *Gastroenterology* 2017;152:277-295 e3.
17. Pascua M, Su C, Lewis JD, et al. Meta-analysis: factors predicting post-operative recurrence with placebo therapy in patients with Crohn's disease. *Aliment Pharmacol Ther* 2008;28:545-556.
18. Auzolle C, Nancey S, Tran-Minh ML, et al. Male gender, active smoking and previous intestinal resection are risk

MENTORING, EDUCATION, AND TRAINING CORNER

- factors for post-operative endoscopic recurrence in Crohn's disease: results from a prospective cohort study. *Aliment Pharmacol Ther* 2018;48:924–932.
19. Simillis C, Jacovides M, Reese GE, et al. Meta-analysis of the role of granulomas in the recurrence of Crohn disease. *Dis Colon Rectum* 2010;53:177–185.
 20. Wasmann K, van Amesfoort J, van Montfoort ML, et al. The Predictive Value of Inflammation at Ileocecal Resection Margins for Postoperative Crohn's Recurrence: A Cohort Study. *Inflamm Bowel Dis* 2019.
 21. Ferrante M, de Hertogh G, Hlavaty T, et al. The value of myenteric plexitis to predict early postoperative Crohn's disease recurrence. *Gastroenterology* 2006;130:1595–1606.
 22. Nyhlin H, Merrick MV, Eastwood MA. Bile acid malabsorption in Crohn's disease and indications for its assessment using SeHCAT. *Gut* 1994;35:90–93.
 23. Greco A, Caviglia GP, Brignolo P, et al. Glucose breath test and Crohn's disease: Diagnosis of small intestinal bacterial overgrowth and evaluation of therapeutic response. *Scand J Gastroenterol* 2015;50:1376–1381.
 24. Klaus J, Spaniol U, Adler G, et al. Small intestinal bacterial overgrowth mimicking acute flare as a pitfall in patients with Crohn's Disease. *BMC Gastroenterol* 2009;9:61.
 25. Sailer J, Peloschek P, Reinisch W, et al. Anastomotic recurrence of Crohn's disease after ileocolic resection: comparison of MR enteroclysis with endoscopy. *Eur Radiol* 2008;18:2512–2521.
 26. Calabrese E, Petruzzello C, Onali S, et al. Severity of postoperative recurrence in Crohn's disease: correlation between endoscopic and sonographic findings. *Inflamm Bowel Dis* 2009;15:1635–1642.
 27. Wright EK, Kamm MA, De Cruz P, et al. Measurement of fecal calprotectin improves monitoring and detection of recurrence of Crohn's disease after surgery. *Gastroenterology* 2015;148:938–947 e1.
 28. Boschetti G, Laidet M, Moussata D, et al. Levels of Fecal Calprotectin Are Associated With the Severity of Postoperative Endoscopic Recurrence in Asymptomatic Patients With Crohn's Disease. *Am J Gastroenterol* 2015;110:865–872.
 29. Mowat C, Arnott I, Cahill A, et al. Mercaptopurine versus placebo to prevent recurrence of Crohn's disease after surgical resection (TOPPIC): a multicentre, double-blind, randomised controlled trial. *Lancet Gastroenterol Hepatol* 2016;1:273–282.
 30. Rutgeerts P, Van Assche G, Vermeire S, et al. Ornidazole for prophylaxis of postoperative Crohn's disease recurrence: a randomized, double-blind, placebo-controlled trial. *Gastroenterology* 2005;128:856–861.
 31. D'Haens GR, Vermeire S, Van Assche G, et al. Therapy of metronidazole with azathioprine to prevent postoperative recurrence of Crohn's disease: a controlled randomized trial. *Gastroenterology* 2008;135:1123–1129.
 32. De Cruz P, Kamm MA, Hamilton AL, et al. Crohn's disease management after intestinal resection: a randomized trial. *Lancet* 2015;385:1406–1417.
 33. Herfarth HH, Katz JA, Hanauer SB, et al. Ciprofloxacin for the prevention of postoperative recurrence in patients with Crohn's disease: a randomized, double-blind, placebo-controlled pilot study. *Inflamm Bowel Dis* 2013;19:1073–1079.
 34. Ford AC, Khan KJ, Talley NJ, et al. 5-aminosalicylates prevent relapse of Crohn's disease after surgically induced remission: systematic review and meta-analysis. *Am J Gastroenterol* 2011;106:413–420.
 35. Gjuladin-Hellon T, Iheozor-Ejiofor Z, Gordon M, et al. Azathioprine and 6-mercaptopurine for maintenance of surgically-induced remission in Crohn's disease. *Cochrane Database Syst Rev* 2019;8:CD010233.
 36. Hanauer SB, Korelitz BI, Rutgeerts P, et al. Postoperative maintenance of Crohn's disease remission with 6-mercaptopurine, mesalamine, or placebo: a 2-year trial. *Gastroenterology* 2004;127:723–729.
 37. Regueiro M, Schraut W, Baidoo L, et al. Infliximab prevents Crohn's disease recurrence after ileal resection. *Gastroenterology* 2009;136:441–450 e1; quiz 716.
 38. Regueiro M, Feagan BG, Zou B, et al. Infliximab Reduces Endoscopic, but Not Clinical, Recurrence of Crohn's Disease After Ileocolonic Resection. *Gastroenterology* 2016;150:1568–1578.
 39. Regueiro M, Kip KE, Baidoo L, et al. Postoperative therapy with infliximab prevents long-term Crohn's disease recurrence. *Clin Gastroenterol Hepatol* 2014;12:1494–14502 e1.
 40. Collins M, Sarter H, Gower-Rousseau C, et al. Previous Exposure to Multiple Anti-TNF Is Associated with Decreased Efficiency in Preventing Postoperative Crohn's Disease Recurrence. *J Crohns Colitis* 2017;11:281–288.
 41. Lopez-Sanroman A, Vera-Mendoza I, Domenech E, et al. Adalimumab vs Azathioprine in the Prevention of Postoperative Crohn's Disease Recurrence. A GETECCU Randomised Trial. *J Crohns Colitis* 2017;11:1293–1301.
 42. Savarino E, Bodini G, Dulbecco P, et al. Adalimumab is more effective than azathioprine and mesalamine at preventing postoperative recurrence of Crohn's disease: a randomized controlled trial. *Am J Gastroenterol* 2013;108:1731–1742.
 43. Thienpont C, D'Hoore A, Vermeire S, et al. Long-term outcome of endoscopic dilatation in patients with Crohn's disease is not affected by disease activity or medical therapy. *Gut* 2010;59:320–324.
 44. Ding NS, Yip WM, Choi CH, et al. Endoscopic Dilatation of Crohn's Anastomotic Strictures is Effective in the Long Term, and Escalation of Medical Therapy Improves Outcomes in the Biologic Era. *J Crohns Colitis* 2016;10:1172–1178.
 45. Ponsioen CY, de Groof EJ, Eshuis EJ, et al. Laparoscopic ileocaecal resection versus infliximab for terminal ileitis in Crohn's disease: a randomised controlled, open-label, multicentre trial. *Lancet Gastroenterol Hepatol* 2017;2:785–792.

Correspondence

Address correspondence to: Herbert Tilg, MD, Department of Internal Medicine I, Gastroenterology, Hepatology & Endocrinology, Medical University Innsbruck, Innsbruck, Austria, e-mail: herbert.tilg@i-med.ac.at; and Geert D'Haens, M.D., Department of Gastroenterology and Hepatology, Amsterdam University Medical Centre, Academic Medical Centre, Amsterdam, Netherlands; e-mail: g.dhaens@amsterdamumc.nl.

Conflicts of interest

The authors disclose no conflicts.