



## FROM THE JOURNALS

# Open-capsule PPIs linked to faster ulcer healing after Roux-en-Y

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**Key clinical point:** The use of proton pump inhibitors in opened instead of closed capsules was associated with a nearly fourfold shorter median healing time among patients who developed ulcers at the gastrojejunal anastomosis after Roux-en-Y gastric bypass.

**Major finding:** The median time to ulcer healing was 91.0 versus 342.0 days for the open- and closed-capsule groups, respectively (*P* less than .001).

**Data source:** A single-center retrospective study of 162 patients.

**Disclosures:** The investigators did not acknowledge external funding sources. Dr. Schulman and four coinvestigators reported having no competing interests. One coinvestigator disclosed ties to Olympus, Boston Scientific, and Covidien.

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## FROM CLINICAL GASTROENTEROLOGY AND HEPATOLOGY

The use of proton pump inhibitors in opened instead of closed capsules was associated with a nearly fourfold shorter median healing time among patients who developed marginal ulcers after Roux-en-Y gastric bypass, in a single-center retrospective cohort study.

In contrast, the specific class of proton pump inhibitor (PPI) did not affect healing times, wrote Allison R. Schulman, MD, and her associates at Brigham and Women's Hospital, Boston. The report is in the April issue of *Clinical Gastroenterology and Hepatology* ([doi: 10.1016/j.cgh.2016.10.015](https://doi.org/10.1016/j.cgh.2016.10.015)). "Given these results and the high prevalence of marginal ulceration in this patient population, further study in a randomized controlled setting is warranted, and use of open-capsule PPIs should be considered as a low-risk, low-cost alternative," they added.

Roux-en-Y gastric bypass is one of the most common types of gastric bypass surgeries in the world, and up to 16% of patients develop postsurgical ulcers at the gastrojejunal anastomosis, the investigators noted. Acidity is a prime suspect in these "marginal ulcerations" because bypassing the acid-buffering duodenum exposes the jejunum to acid from the stomach, they added. High-dose PPIs are the main treatment, but there is no consensus on the formulation or dose of therapy. Because

Roux-en-Y creates a small gastric pouch and hastens small-bowel transit, closed capsules designed to break down in the stomach “even may make their way to the colon before breakdown occurs,” they wrote.

They reviewed medical charts from patients who developed marginal ulcerations after undergoing Roux-en-Y gastric bypass at their hospital from 2000 through 2015. A total of 115 patients received open-capsule PPIs and 49 received intact capsules. All were followed until their ulcers healed.

For the open-capsule group, median time to healing was 91 days, compared with 342 days for the closed-capsule group ( $P$  less than .001). Importantly, capsule type was the only independent predictor of healing time (hazard ratio, 6.0; 95% confidence interval, 3.7 to 9.8;  $P$  less than .001) in a Cox regression model that included other known correlates of ulcer healing, including age, smoking status, the use of nonsteroidal anti-inflammatory drugs, *Helicobacter pylori* infection, the length of the gastric pouch, and the presence of fistulae or foreign bodies such as sutures or staples.

The use of sucralfate also did not affect time to ulcer healing, reflecting “many previous studies showing a lack of definitive benefit to this medication,” the researchers said. The findings have “tremendous implications” for health care utilization, they added. Indeed, patients who received open-capsule PPIs needed significantly fewer endoscopic procedures (median, 1.2 versus 1.8;  $P = .02$ ) and used fewer health care resources overall (\$7,206 versus \$11,009;  $P = .05$ ) compared with those prescribed intact PPI capsules.

This study was limited to patients who developed ulcer symptoms and underwent repeated surveillance endoscopies after surgery, the researchers noted. Selection bias is always a concern with retrospective studies, but insurers always covered both types of therapy and the choice of capsule type was entirely up to providers, all of whom consistently prescribed either open- or closed-capsule PPI therapy, they added.

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## View on the News

### A 'SOLUBLE FORM OF PPI'

Proton pump inhibitors (PPIs) are frequently employed to treat marginal ulcers after Roux-en-Y

gastric bypass (RYGB). In a retrospective study, Schulman et al. compared intact vs. “open” PPI capsules.



Dr. Loren Laine

As justification, the authors indicate that PPI capsules pass very distally before they break down in RYGB patients, sometimes even making their way to the colon – although they provide no supporting reference for this statement.

They state that “this may be overcome by use of a soluble form of PPI,” but don’t state what is meant by “soluble PPI” or how the open-capsule PPI was delivered. Among the PPIs they reported using to compare intact vs. open capsules was Protonix [pantoprazole] which is not produced as a capsule, and soluble Prevacid [lansoprazole], which is an orally disintegrating tablet that should provide characteristics similar to an “open capsule.”

PPI capsules provide PPI in enteric-coated granules, which are designed to protect the PPI from acid degradation in the stomach of individuals with intact gastrointestinal tracts and allow more of the PPI dose to reach the small intestine where it is absorbed. If capsules really fail to release their enteric-coated granules until very distally in RYGB patients, bypassing this step to allow earlier release of PPI makes intuitive sense; formulations such as suspensions and rapidly disintegrating tablets that deliver enteric-coated granules without capsules are currently available.

However, if this is an issue, administering a suspension of uncoated PPI with bicarbonate potentially might be the most attractive option, given more rapid absorption than PPI delivered as enteric-coated granules.

*Loren Laine, MD, AGAF, professor of medicine, digestive diseases, Yale University, New Haven, Conn. He has no conflicts of interest.*

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