Experimental models of obesity and diabetes have identified a complex array of hormonal interactions that are influenced by the upper GI tract. The increasing numbers of patients who have undergone gastric bypass are providing an ample study population to investigate these interactions.

Many gastric bypass patients say that, even months after the surgery, they are no longer hungry. A recent study has demonstrated that persistently low levels of the stomach hormone ghrelin are secreted following a gastric bypass. Ghrelin levels typically increase before a meal and are associated with the sensation of hunger. Might low levels of this appetite-enhancing hormone be the reason that hunger is suppressed and provide some clues as to why the gastric bypass is more effective than procedures that let food traverse the normal GI pathway?

Complications: But even as bariatric surgery seems to be helping obese patients lose weight, there is some risk of complications, including ulcers at the site of the surgery—a risk that ranges from zero to 10%. No one knows why there is such a wide range. It’s unlikely that the ulcers are caused by stomach acid, because today’s gastric pouches are smaller than the ones that Mason created—so less acid bathes the nearby jejunum. If ulcers do develop, they tend to appear a few weeks after the surgery. After being treated with medicines or by dilating the connection between the stomach and the small intestine, they usually go away without long-term therapy. A recently developed experimental model of the gastric bypass using an obese rat might provide the opportunity to determine if a novel pathophysiologic mechanism of stomach-induced small bowel injury is responsible.

The pathophysiologic complexity of obesity and diabetes and the effects of gastric bypass surgery are more compelling than the transient difficulties at the surgical site that are described above; these effects demand further study in obese rats. Lessons thus learned can then be studied in the ever-increasing population of humans who are receiving this intervention.

Interplay: The threat of obesity and diabetes is steadily increasing in this country. More than 25% of adult Americans are now obese, with six million considered morbidly obese—that is, at least 100 pounds overweight. Effective surgical therapy not only provides an immediate decrease in the obesity-related threats to their health, but also offers a continuing opportunity for an interplay between bench and clinical research—and the hope that these health- and life-threatening illnesses can eventually be controlled with even less radical techniques than Mason could ever have envisioned.