OBESITY

**BARIATRIC SURGERY—
LONG-TERM EFFECTS**

Roux-en-Y gastric bypass and vertical banded gastroplasty result in similar changes in the composition of the gut microbiome, according to new findings published in *Cell Metabolism*. These changes seem to alter the metabolism of the patient, which results in reduced adiposity.

Increasingly, it is being recognized that patients with metabolic diseases have a different gut microbiota compared with healthy individuals. Furthermore, animal studies have revealed that this relationship is causal. Bariatric surgery can affect the microbial ecosystem; changes in the composition of the gut microbiota persist in the short-term following Roux-en-Y gastric bypass. “We wanted to investigate whether these changes are persistent over time and whether different types of bariatric surgery have similar effects,” says corresponding author Fredrik Bäckhed. “Finally, we wanted to see whether the altered microbiota contributed to the improved metabolic phenotype following bariatric surgery.”

The study included 14 women who had been randomly assigned to undergo either Roux-en-Y gastric bypass or vertical banded gastroplasty, as well as a control group of women who did not undergo surgery and were matched to the BMIs of the patients before or after surgery. Faecal samples were obtained from the women (who all had a stable weight) 9.4 years after the surgery. Shotgun sequencing was then used to analyse the faecal metagenome.

The two surgical procedures resulted in similar changes in the composition of the gut microbiome. The investigators used metabolomics to demonstrate that bile acid metabolism was altered after surgery, which seemed to be linked to the changes in the microbial metagenome. To demonstrate causality, Bäckhed and colleagues transplanted faecal microbiota from women who had undergone surgery and from control women with obesity who had not into germ-free mice. The mice that received transplants from the women who underwent surgery accumulated substantially less body fat than the control mice and had altered metabolism. The researchers plan to use animal models and large cohorts of patients to investigate potential mechanisms of action.

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Original article Tremaroli, V. *et al.* Roux-en-Y gastric bypass and vertical banded gastroplasty induce long-term changes on the human gut microbiome contributing to fat mass regulation. *Cell Metab.* **22**, 1–11 (2015)