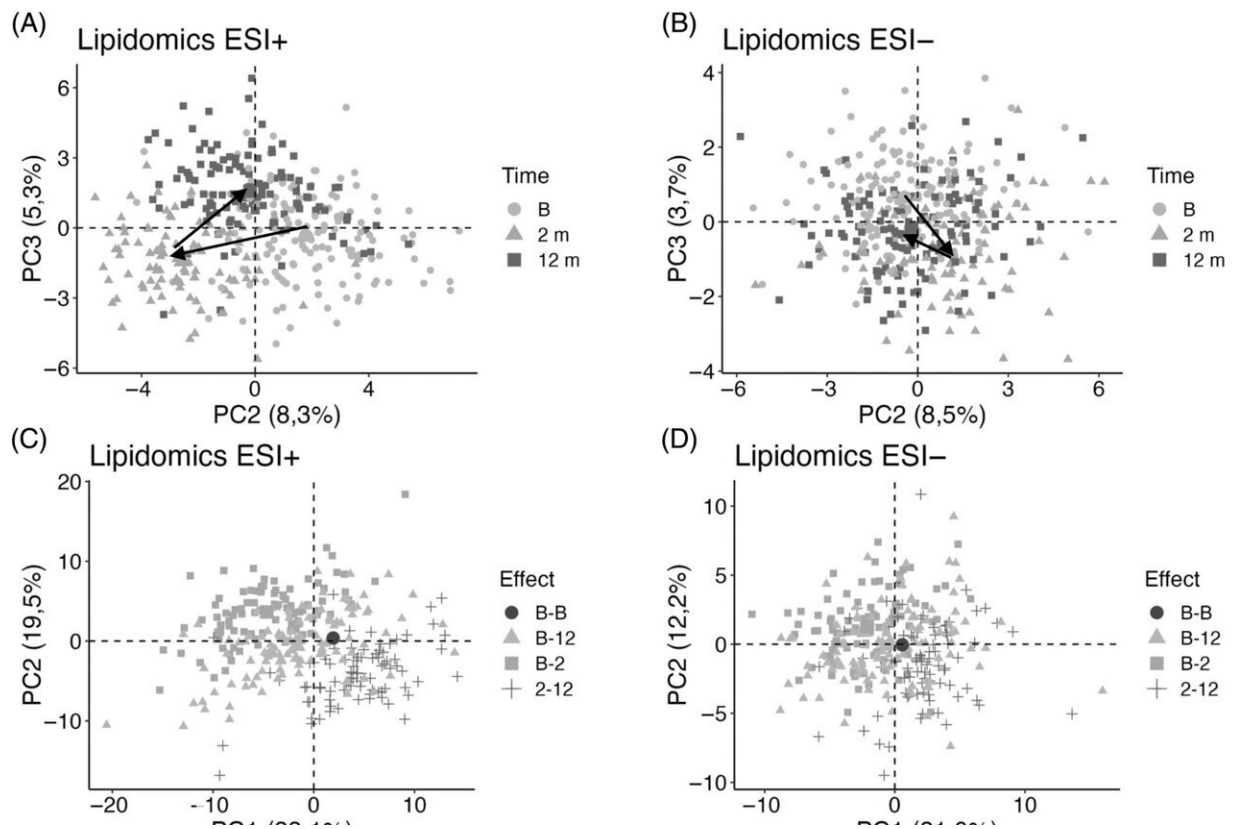


Positive metabolic effects of gastric bypass found to disappear quickly

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PCA score plots for lipidomics data acquired in positive (ESI+; 80 annotated lipids) and negative (ESI-; 46 annotated lipids) ESI mode. PCA was conducted on (A,B) metabolite levels and (C,D) changes in metabolite levels (effects) within defined time ranges: short term (2 months vs. baseline), long term (12 vs. 2 months), cumulative (12 months vs. baseline), and reference (baseline vs. baseline). (E,F) Changes in the lipidome for individual study participants are illustrated in the score trajectory plots, with trajectories estimated as described in Figure 1. *P* values are shown for the factor time, using the model: score ~ Time +

T2D + Sex + Time:T2D + Time:Sex, nested by patient ID. *** $p < 0.05$. ESI, electrospray ionization; NS, not significant; PCA, principal component analysis; T2D, type 2. Credit: *Obesity* (2023). DOI: 10.1002/oby.23864

A new study from Lund University in Sweden raises questions about the efficacy of bariatric operations involving gastric bypass. The results show that the biggest metabolic changes happened directly after surgery. Just a year after the operation, the concentration of metabolites and fats had returned to almost the same levels as before the procedure.

Previous research has shown that the majority of those who undergo surgery regain weight within five years of a [gastric bypass](#) operation. It has still not been established what happens to the [metabolism](#) of those who have had a bariatric procedure. In a new study published in the journal *Obesity*, the researchers studied the metabolism of overweight individuals before and after they had a gastric bypass operation. The study shows that the biggest changes happened straight after the procedure.

One year later, the concentration of metabolites and fats among all the participants were nearing the same levels as before the operation.

"Just following up on the weight of people can be a blunt instrument for studying the effects of the procedure. Our study provides a greater understanding of what happens to the metabolism in connection with a gastric bypass operation," says Peter Spégel, associate professor of molecular metabolism at Lund University, who led the study.

Rapid changes

The study was based on data from 148 people with and without type 2

diabetes who underwent a gastric bypass operation in Sweden. Blood samples were collected from participants just before the procedure and on at least two occasions after the operation. Their [body mass index](#) (BMI) was measured before the operation and on three occasions afterwards.

The researchers conducted detailed analyses of fats and metabolites in the blood. Just one year after the operation, some of the participants were back at exactly the same levels as before the surgery, whereas the reversion was not as marked for others.

"We could see the changes while the participants still had a low BMI after the operation. By studying metabolism, we can obtain a clear indication that unhealthy changes are on the way. We hope that the knowledge can be used in follow-up so that [preventive measures](#) can be put in place," says Nils Wierup, professor of neuroendocrine cell biology at Lund University and one of the main authors of the article.

Increased risk of type 2 diabetes

The levels of certain polyunsaturated fats increased straight after the operation to then fall and approach the same levels as previously. Polyunsaturated fats are essential and can reduce the risk of cardiovascular disease. The study also showed a reduction in the concentration of a certain type of amino acids after the operation and then a subsequent rise. The levels of these amino acids are usually high in individuals with [insulin resistance](#) and carry an increased risk of developing type 2 diabetes.

"One conclusion we draw is that the risk of developing type 2 diabetes is considerably reduced after the operation among individuals who do not have the disease, but one year later we see an increased risk again. Among individuals who already had type 2 diabetes at the time of the

surgery, we see a remission of the disease, but the risk of the disease returning then increases over time," says Peter Spéjel.

The benefit of bariatric operations

Individuals who undergo surgery for obesity need to lose weight before the operation by means of a diet. A previous study by the same research team examined the effects of a low-calorie diet and a gastric bypass operation separately. The study showed that the diet had the biggest effect on metabolism, whereas the surgery led to quite small changes. The researchers' latest study now shows that for many people, the positive effects on metabolism subside as soon as one year later.

"We need more and larger studies in order to draw reliable conclusions. One advantage of bariatric operations is that a majority of people with type 2 diabetes see a remission of their disease afterwards. And even though a large percentage of individuals who undergo this procedure gain weight afterwards, it's usually not a return to the same weight as before. In the future, we want to take a closer look at what happens to metabolism on an individual level, as this can vary," concludes Nils Wierup.

More information: Oksana Rogova et al, Metabolic remission precedes possible weight regain after gastric bypass surgery, *Obesity* (2023). DOI: [10.1002/oby.23864](https://doi.org/10.1002/oby.23864).
onlinelibrary.wiley.com/doi/full/10.1002/oby.23864

Provided by Lund University

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