



## HYPOTHYROIDISM

# Levothyroxine dose may change after weight loss surgery in patients with hypothyroidism

### BACKGROUND

Obesity is a major health problem in the United States and is getting worse. Further, the number of patients that are severely obese (BMI >35) is steadily increasing. These individuals are at high risk for significant weight-related complications. Bariatric, or weight loss, surgery is becoming more common and is the most effective treatment for severely obese individuals. The goal of bariatric surgery is to markedly decrease stomach volume so patients must eat less and, therefore, lose weight. Among different procedures used for bariatric surgery, sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) are mostly frequently used. In SG, stomach is cut to create a sleeve to the small intestines, decreasing the size of the stomach while keeping it intact. In RYGB, stomach is cut leaving only a small pouch, and the front portion of the remaining stomach is connected directly to the small intestines. Both procedures also decrease stomach acid content. In RYGB, the small intestines are also shortened. Since levothyroxine is absorbed in the small intestine, the amount of levothyroxine required may change after bariatric surgery in patients who have hypothyroidism. This study was done to compare changes in levothyroxine dose in the first 2 years after SG and RYGB bariatric surgery.

### THE FULL ARTICLE TITLE

Julià H et al. 2019 Changes in Thyroid Replacement Therapy after Bariatric Surgery: Differences between Laparoscopic Roux-en-Y Gastric Bypass and laparoscopic Sleeve Gastrectomy. *Obes Surg* doi. 10.1007/s11695-019-03890-9 [Epub ahead of print]

### SUMMARY OF THE STUDY

A total of 35 patients (91.4% women) with hypothyroidism who underwent bariatric surgery in Spain between January 2004 and December 2015 were included in the study. A total of 13 patients had SG and 22 patients had RYGB. All patient had blood thyroid stimulating

hormone (TSH) levels measured before surgery and at 3, 6, 12, 18, and 24 months after bariatric surgery, and levothyroxine dose was changed as needed. At each visit, the levothyroxine dose was recorded as 1) total dose per day and 2) total dose/body weight (weight-based dose) per day.

At 24 months after bariatric surgery, the average total daily levothyroxine dose was significantly less in patients who had SG (133.7 mcg/day before surgery as compared to 104 mcg/day after surgery) while the average weight-based daily levothyroxine dose was unchanged (1.15 mcg/kg/day before surgery and 1.11 mcg/kg/day after surgery). In contrast, the average total daily levothyroxine dose was unchanged in the RYGB group after surgery (129.5 mcg/day before surgery and 125.2 mcg/day after surgery). While the dose of the group as a whole did not change, there was a marked variability in changes in total daily levothyroxine dose among the patients who underwent RYGB, with 41% requiring a decrease in dose, 41% no change, and 18% an increase in dose. However, the average weight-based daily levothyroxine dose increased in RYGB group (1.11 mcg/kg/day before surgery and 1.57 mcg/kg/day after surgery).

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that the levothyroxine requirements in patients with hypothyroidism change after bariatric surgery. Interestingly, while the total daily dose is more affected after SG than RYGB, the dose/body weight changed to a greater degree after RYGB than SG. Given the variability in changes in levothyroxine dose and potential need to decrease the levothyroxine dose after bariatric surgery, thyroid hormone levels should be closely monitored in patients with hypothyroidism for at least 24 months after bariatric surgery.

— Sun Lee, MD





## HYPOTHYROIDISM, continued

### ATA THYROID BROCHURE LINKS

Hypothyroidism (Underactive): <https://www.thyroid.org/hypothyroidism/>

Thyroid Hormone Treatment: <https://www.thyroid.org/thyroid-hormone-treatment/>

Thyroid and Weight: <https://www.thyroid.org/thyroid-and-weight/>

### ABBREVIATIONS & DEFINITIONS

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

**Levothyroxine (T4):** the major hormone produced by the thyroid gland and available in pill form as Synthroid™, Levoxyl™, Tyrosint™ and generic preparations.

**Bariatric surgery:** surgery where the stomach volume is decreased to assist in weight loss. Two general types are Roux-en-Y gastric bypass, where part of the stomach is removed and gastric sleeve surgery, where the stomach is constricted but remains intact.

