



## HYPOTHYROIDISM

# Does bariatric surgery decrease levothyroxine requirements among hypothyroid patients?

### BACKGROUND

According to the American Society for Metabolic and Bariatric Surgery, 179,000 bariatric surgeries were performed in the United States in 2013. The two most common bariatric procedures are including Roux-en-Y gastric bypass, where part of the stomach is removed (34.2% of surgeries) and gastric sleeve procedures, where the stomach is constricted but remains intact (42.1% of surgeries). Obesity and hypothyroidism often occur in the same patient and ~18% of bariatric surgery patients require thyroid hormone therapy. It has previously been demonstrated in patients not taking thyroid hormone that both T<sub>3</sub> and TSH are elevated in obese individuals and that levels of TSH, T<sub>3</sub>, or both tend to fall after either diet- or surgery-induced weight loss. A recent study demonstrated that average levothyroxine doses decreased proportionally with decreases in lean body mass in hypothyroid individuals following bariatric surgery. This study further examines the levothyroxine dose requirements after bariatric surgery in a population that received mainly gastric sleeve surgery.

### THE FULL ARTICLE TITLE

Zendel A et al. The impact of bariatric surgery on thyroid function and medication use in patients with hypothyroidism. *Obes Surg*. March 2, 2017 [Epub ahead of print].

### SUMMARY OF THE STUDY

The medical records of all patients who underwent bariatric surgery between 2009 and 2014 at a single center in Tel Aviv were reviewed. A total of 93 patients with a diagnosis of hypothyroidism made prior to their surgery (5.1% of all individuals in the database) were included. The diagnosis of hypothyroidism was made by primary care providers prior to referral for bariatric surgery and based on elevated serum TSH values on a minimum of two occasions. No patients had a history of thyroid surgery or radioactive iodine therapy. Body-mass index (BMI), TSH, free T<sub>4</sub>, and levothyroxine doses were assessed at baseline and at 6 and 12 months after bariatric surgery. Thyroid hormone dosing was managed

by clinical providers and was not done according to a study protocol.

Of the 93 study participants, 85 (91%) were women and the average age at surgery was 46.6 years. The majority of patients (77 (83%)) underwent gastric sleeve surgery. The remaining 16 patients underwent Roux-en-Y gastric bypass. The average baseline BMI was 43.7 and declined to 34.4 at 6 months and to 29.8 at 12 months. Most patients (89%) were treated with L-T<sub>4</sub> prior to surgery. The average baseline TSH was 3.9 mIU/L; this decreased to 3.0 mIU/L at 6 months and subsequently stabilized at 3.0 mIU/L at 12 months. The baseline average free T<sub>4</sub> was 13.7 pmol/L. This increased to 15 pmol/L at 6 months and to 14.9 pmol/L at 12 months. The average daily dose of L-T<sub>4</sub> at baseline was 98.4 µg. This decreased to 89.7 µg at 12 months. Ten patients (12%) required lowered levothyroxine doses and 11 patients (13%) stopped levothyroxine treatment altogether following their bariatric procedures. The likelihood of decreased levothyroxine dose requirement did not differ by age, sex, baseline BMI, or baseline levothyroxine dose.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study confirms that levothyroxine requirements in obese hypothyroid patients decreases after bariatric surgery, whether it is gastric bypass or gastric sleeve surgery. The average dose decreased ~9 mcg per day. This study shows that all hypothyroid patients need serial TSH monitoring after bariatric surgery.

— Alan P. Farwell, MD, FACE

### ATA THYROID BROCHURE LINKS

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

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

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



## HYPOTHYROIDISM, continued

### ABBREVIATIONS & DEFINITIONS

**Body-mass index (BMI):** a standardized measure of obesity calculated by dividing the weight in kilograms by the square of the height. A normal BMI is 18.5-24.9, overweight is 25-30 and obese is >30.

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

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

**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.

**Thyroxine (T4):** the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body.

**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.

## Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravolets™ will be donated to the ATA. The month of July is **Graves' Disease Awareness Month** and a bracelet is available through the [ATA Marketplace](#) to support thyroid cancer awareness and education related to thyroid disease.

