

# Laparoscopic Sleeve Gastrectomy Leads to Reduction in Thyroxine Requirement in Morbidly Obese Patients With Hypothyroidism

Sandeep Aggarwal · Shrey Modi · Toney Jose

Published online: 21 May 2014  
© Société Internationale de Chirurgie 2014

## Abstract

**Background** The impact of laparoscopic sleeve gastrectomy (LSG) on various co-morbidities including type II diabetes mellitus, hypertension, and sleep apnea is well established. However, its effect on hypothyroidism has not been given due attention evidenced by the scant literature on the subject. The purpose of this report is to assess the change in thyroxine ( $T_4$ ) requirement in morbidly obese patients with clinical hypothyroidism after LSG.

**Methods** We conducted a retrospective review of morbidly obese patients on  $T_4$  replacement therapy for clinical hypothyroidism who underwent LSG from August 2009 to July 2012 at our institution.

**Results** Of the 200 patients who underwent LSG during this period, 21 (10.5 %) were on  $T_4$  replacement therapy preoperatively for clinical hypothyroidism. Two patients were lost to follow-up. The remaining 19 patients were categorized into two groups. Group 1 comprised 13 patients with decreased  $T_4$  requirements after LSG. Group 2 comprised six patients in whom the  $T_4$  dose remained unaltered. The mean change in  $T_4$  requirement in group 1 was 42.07 % (12–100 %). Group 1 patients had a significantly higher mean preoperative body mass index (48.7 vs. 43.0 kg/m<sup>2</sup>;  $p = 0.03$ ) than the group 2 patients. There was a significant correlation between the percentage excess weight loss and the percentage change in  $T_4$  requirement in group 1 ( $r = 0.607$ ,  $p = 0.028$ ).

**Conclusions** Sleeve gastrectomy has a favorable impact on hypothyroid status as seen by a reduction in  $T_4$

requirement in the majority of morbidly obese patients with overt hypothyroidism.

## Introduction

There is an increased prevalence of hypothyroidism among obese populations [1, 2]. Obese individuals have relative resistance to thyroxine ( $T_4$ ), resulting in increased levels of serum thyrotropin, TSH [2]. Another possible explanation is that such an increase may be an adaptive response to chronic nutrient surfeit because  $T_4$  increases resting energy expenditure (REE), diminishing the available energy for accumulation in fats [3]. Weight loss surgery such as laparoscopic Roux-en-Y gastric bypass (LRYGB) has been reported to result in a reduced  $T_4$  replacement dose in hypothyroid patients [4, 5]. Laparoscopic sleeve gastrectomy (LSG) has also been shown to affect thyroid hormone kinetics [6], although its impact on changes in  $T_4$  requirement has not been reported. The present report focuses on the change in  $T_4$  replacement dosage as a marker for an effect on hypothyroidism in obese patients with overt hypothyroidism undergoing LSG.

## Materials and methods

We conducted a retrospective cohort study with observational characteristics from the August 2009 to July 2012. Of the 200 morbidly obese patients who underwent LSG during this period, 21 patients were found to be on  $T_4$  replacement preoperatively for overt hypothyroidism. Patients determined to have subclinical hypothyroidism during preoperative evaluation were excluded from the study. Of the 21 patients, 19 were available for follow-up.

---

S. Aggarwal (✉) · S. Modi · T. Jose  
Department of Surgical Disciplines, All India Institute of  
Medical Sciences (AIIMS), Ansari Nagar, New Delhi 110029,  
India  
e-mail: sandeep\_aiims@yahoo.co.in