



## Letter to the Editor Concerning “The Impact of Roux-en-Y Gastric Bypass on Bone Remodeling Expressed by the P1NP/ $\beta$ CTX Ratio: a Single-Center Prospective Cohort Study”

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Bariatric surgery is associated with bone remodeling changes. The change in body composition of patients who underwent Roux-en-Y gastric bypass is significant for all variables (lean body mass, body fat mass, and bone mass) during the first year postoperatively.

We read with interest the study of Muller MK et al. The Impact of Roux-en-Y Gastric Bypass RYGB on Bone Remodeling Expressed by the P1NP/ $\beta$ CTX Ratio: a Single-Center Prospective Cohort Study [1]. The authors have concluded that following RYGB, bone remodeling increases, with a shift toward degradation. This effect seems to be weight loss independent and shows a correlation with age, with the level of systemic inflammation, and with nutritional state. We disagree with the enthusiasm of the authors.

In the same time, we do not agree with Muller MK et al. We agree that postoperative bone loss and increased fracture risk associated with RYGB have been attributed to vitamin D/calcium malabsorption and resultant secondary hyperparathyroidism (HPT) [2]. Niu A concluded that “Our findings not only underscore the importance of lifelong repletion of both calcium and vitamin D but also suggest that additional factors affect skeletal health in this population.” The RYGB induced weight loss, and biochemical, hormonal, and body composition changes are associated with higher bone remodeling [3]. Hypovitaminosis D is prevalent in obese individuals, and RYGB is related to carboxy-terminal cross-linking telopeptides of type-I collagen (CTX) increase

without bone-specific alkaline phosphatase (BSAP) alteration in the first follow-up semester [4].

RYGB was found to worsen the inadequacy of micronutrients related to bone metabolism and was associated with secondary hyperparathyroidism and low bone mineral density (BMD) values, especially among the adolescents. The irreversible damaging effects of obesity on bone metabolism can occur in adolescence [5].

In addition, it is essential to take into account the disease of obesity which is different before and after the ages of 40 and the eating behavior which may explain some failures after RYGB. This was not done in this study. This study lacks hindsight seeing as absorption occurs in the alimentary loop again, through mucosal hypertrophy. Over time, RYGB loses its malabsorption mechanism and theoretically retains its restriction mechanism which is due both to the size of the gastric pouch and also to the diameter of the gastrojejunal anastomoses. Finally, the fact that the RYGB is said to be mostly restrictive opens the discussion on the RYGB calibrated diameter.

In our bariatric center, we affirm that multidisciplinary protocols for bariatric surgery need to focus on management, with use of bony strategies and others as rheumatologist. Whole of these strategies could improve the outcomes of the obese patients.

### Compliance with Ethical Standards

**Conflict of Interest** The author declares that there is no conflict of interest.

**Statement of Informed Consent** Informed consent was obtained from all individual participants included in the study.

**Statement of Human and Animal Rights** Informed consent was obtained from all individual participants included in the study.

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