

Gastric bypass and duodenal switch cause body weight loss through different mechanisms in rats

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Background/Aim: It is still a challenge how to select the most suitable surgical procedure for each individual obese patient. Both gastric bypass (GB) and duodenal switch associated with sleeve gastrectomy (DS) have been widely used as bariatric surgery, and DS appears to be superior to GB, particularly for morbid obesity. The aim of the present study was to compare these procedures with respect to the mechanisms leading to body weight loss in rats.

Methods: Male Sprague-Dawley rats were subjected to GB, DS, or laparotomy (as controls) and followed for 2-14 weeks by an open-circuit indirect calorimeter composed in comprehensive laboratory animal monitoring system and adiabatic bomb calorimeter.

Results: Body weight loss was greater after DS than GB. Calorie intake in terms of kcal/day/rat, kcal/day/100 g body weight, and kcal/meal was reduced after DS but not GB. The fecal energy content (expressed as J/g) was increased after DS but not after GB. Energy expenditure (kcal/hr/100 g body weight) was increased during nighttime at 3 weeks and then during daytime at 14 weeks after GB. The energy expenditure was increased both at 2 weeks (during daytime) and 8 weeks (during both daytime and nighttime) after DS. Respiratory exchange ratio, i.e., VCO_2/VO_2 , was unchanged after GB, but reduced after DS. Serum ghrelin levels were reduced at 3 weeks after GB but no longer afterwards. Serum CCK levels were greatly increased at least at 8 weeks after DS.

Conclusion: GB induced body weight loss by increasing energy expenditure, whereas DS induced body weight loss by reducing food intake (probably due to hyperCCK-emia), causing malabsorption, and increasing both fat metabolism and energy expenditure.

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