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Sleeve Gastrectomy

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Laparoscopic Sleeve Gastrectomy (LSG) is a restrictive bariatric procedure which involves subtotal gastric resection of the fundus and body to create a long, tubular gastric conduit constructed along the lesser curve of the stomach. There is little long-term information available since this procedure has only been used recently as a primary weight loss surgery procedure. It was originally described as a first-stage bariatric procedure followed by Roux-Y gastric bypass or duodenal switch in high risk patients. But with the benefit of low risk due to less invasiveness, ease of surgery and not being inferior in terms of sustained weight loss, surgeons have accepted LSG as a primary bariatric procedure [1-3].

LSG not only reduces the volume of the stomach, which makes it a restrictive procedure, but also changes gastrointestinal hormone levels such as serum ghrelin, PYY and GLP-1. Therefore, some authors refer that sleeve gastrectomy is not a pure restrictive procedure. This affirmation is supported by recent reports, which have shown that LSG could have similar resolution rates of the metabolic syndrome and a weight loss curve similar to the Roux-Y bypass, a bariatric technique with a malabsorptive component [4-6].

Referring to type 2 diabetes mellitus, some groups have demonstrated a near-normalization of insulin-resistance in patients treated with LSG. The improvement in insulin sensitivity is supposed to be primarily due to weight loss, reduction in inflammatory mediators and decreased calorie intake, although the contribution of weight independent mechanisms seems very likely. It has been established that diabetes improvement appears before a significant weight loss occurs. Some authors have reported glycemic control in over 80% of patients at 1 month. Diverse studies have demonstrated that LSG as unique bariatric procedure, compared with Roux-Y gastric bypass, achieves similar improvements in the glucose homeostasis [5-9].

The effect of sleeve gastrectomy on lipid profile mainly consists in a reduction in cardiovascular risk with increases of HDL-cholesterol and decreases in triglycerides after 1 year [3,10]. Notwithstanding, total cholesterol and LDL-cholesterol were not significantly changed. It has been acknowledged for more than 40 years that some extremely obese subjects have normal serum cholesterol, but certainly remain at high cardiovascular risk [11]. On the other hand, weight loss is associated with a lower cardiovascular risk. That means, that there are other cardiovascular risk factors that improve after weight loss. The triglycerides / HDL ratio has been described as one of the strongest predictor of a heart attack and other cardiovascular complications [12]. Ratio levels over 4 are associated with a high cardiovascular risk.

In a recent study of our group, we observed a significant reduction in this ratio from 4.2 to 3.5 at 1 year and maintained at 3.4 two years after surgery [13]. The Triglycerides/HDL ratio has been proposed as an early marker of insulin resistance, which improves with LSG. The diabetes improvement could be one of the reasons for a decreased cardiovascular risk.

The improvement of hypertension seems to be independent of the bariatric technique performed, though a greater reduction is obtained in those patients with greater weight loss [14]. A resolution of hypertension has been described in 43% after adjustable gastric banding, 69% after gastric bypass and 83% after biliopancreatic diversion, but little has been reported about sleeve gastrectomy. In our morbidly obese patients undergoing LSG, with a hypertension rate of 30%, this comorbidity showed a complete resolution in all the patients (100%), discontinuing all of them the antihypertensive treatment 6 months after surgery. We observed a mean reduction of 37 mmHg in the systolic blood pressure and of 19 mmHg in the diastolic blood pressure.

Apart from these excellent results of metabolic syndrome resolution, another important advantage of sleeve gastrectomy is the lower rate of postoperative nutritional sequelae. Patients undergoing this approach take daily multivitamin supplements during a period no longer than 12 months, and recent reports even describe that these supplements are unnecessary longer than 3 months. This fact contrasts with malabsorptive techniques which require supplements during the rest of their life, representing a reduction in the quality of life of the patients [15, 16].

Patients after bariatric surgery mainly suffer from vitamin B12, folate, iron zinc, protein and vitamin D deficiencies and secondary hyperparathyroidism [17]. In our experience, patients mostly suffered preoperatively from vitamin D deficiency (96.7%) and had elevated PTH (20%), but after sleeve gatrectomy vitamin D levels increased and secondary hyperparathyroidism disappeared [18].

This contrasts with malabsorptive techniques, which are associated with postoperative vitamin D decreases, caused by malabsorption of vitamin D in the bypassed small bowel. The consequent effect of vitamin D deficiencies is demonstrated in Bone Mineral Density (BMD); while a decrease in BMD is associated with malabsorptive techniques, BMD increases over 5% after 12 months and over 7% after 2 years in patients undergoing sleeve gastrectomy [19].

Conclusion

In conclusion, the available evidence supports that LSG is an excellent bariatric technique for weight loss and improvement of comorbidities, with few nutritional consequences. However, there is little evidence of long-term results. Some authors defend that after the 3rd postoperative year a weight regain appears, secondary to an enlargement of the gastric tube [20]. In our opinion, the selection of candidates for this technique is essential, thus the patients must be responsible of their feeding habits in the future, so that after 12 months of a narrow nutritional follow-up in the postoperative course, the patient must have learned to follow a healthy diet during the rest of their life. This is the key of the success of sleeve gastrectomy.

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