Gastric Sleeve and duodenal-ileal end-to-side diversion in Bariatrics: Experience in 100 cases

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**Background:** Currently morbid obesity and the metabolic disorders associated are an increasing health problems that shorten the life expectancy of the population. Bariatric surgery appears to be the most effective tool for managing it, developing a rapid growth and development, and laparoscopic gastric bypass (LRNY GBP) is today the "gold standard".

**Objective:** technical description and preliminary results of the first 100 patients undergoing it.

**Design:** Retrospective descriptive study.

**Results:** In the present series the average age was 35 years, 81% were female, the average BMI was 37.05, found 33% of smoking and pathologies were salient dyslipidemia 60%, resistance insulin 56%, 37% fatty liver, hypertension 28% and II Diabetes Mellitus (T2DM) 18%. There were no conversions to open surgery, and the mean operative time was 75 ± 20 minutes. There were no surgical complications and mortality were the order of 12%, 6% required re intervention and 6% of fistulas successfully managed medically in 50% of cases.

**Conclusions:** In the present study raises the Laparoscopic gastric sleeve (LGS) associated with a single end-to-side anastomosis duodeno-ileal (SESIDDI) as a feasible and reproducible, which presents in our series a zero mortality and low morbidity, being a novel technique, goes hand in hand with the learning curve that is expected to be shortened because of technical simplification.

**Keywords:** Vertical gastrectomy, gastric sleeve, duodenal-ileal bypass, single anastomosis; Morbid obesity, diabetes surgery

**Introduction**

In recent decades, obesity in all its forms, has become an important and growing health disorder, so much so that it has been called "the epidemic of the century" and constitute a global public health problem, worldwide obesity levels are this increase is independent of the degree of development of those countries and recent national data show that more than half of the population is overweight. Genetic predisposition, poor diet, coupled with insufficient physical activity are the main factors behind this increase [1-7].

Morbid obesity (MO) is a complex chronic, multifactorial, and environ-mental condition characterized by an increase in body fat that carries health risks that are associated with the risk of premature death and major physical and psychological complications that undermine quality of life of patients, and it has also been associated with the onset and / or worsening of various chronic diseases such as type 2 diabetes mellitus (DM T2), dyslipidemia, insulin resistance, sleep apnea, cardiovascular disease, musculoskeletal diseases and some cancers as breast cancer, endometrial and colon [1-7], and this condition not only increases health costs, but also socioeconomic burden [3].

To cope with this new epidemic, efforts have focused on the investigation of his treatment. Currently many studies have shown that medical treatment of obesity has unsatisfactory results with a high rate of failure in the long term even with intensive management and combination therapies are needed. The surgical management of obesity has been shown to be a viable option for treatment resulting in long term weight loss, improved quality of life, and correction of metabolic abnormalities associated with OM [8-16]. It exist worldwide consensus that surgery is the only way of effective treatment for the management of MO.

Bariatric surgery has had a rapid growth and development and currently achieves very good results with a low rate of morbidity and mortality, incorporating the laparoscopic technique to gastric bypass (LRNY GBP) as the "gold standard" by using restrictive and malabsorptive concepts to achieve weight-loss (WL) that is maintained over time. In an effort to reduce complication rates modified various techniques in recent years as gastric banding, vertical gastric sleeve (GS) or the mini-gastric bypass (MG-BP), have been developed and all the techniques can be performed by laparoscopy with a low rate of postoperative complications.

Although the LRNY GBP is considered the "gold standard" for the surgical treatment of OM, is far from a perfect technique, therefore, in the way of improvement of bariatric surgery not everything is already written and efforts should be made to achieve a highly efficient operation, with easily reproducible results and a low rate of postoperative complications. In the same way has been developed associated GS + single end-to-side duodeno-ileal diversion (SESIDDI) technique which is based on the principles of the original biliopancreatic diversion, in which after the duodenum sectioned at D1 level it anastomosed to an ileal loop shaped as a Billroth II loop.

**Patients and Methods**

This is a retrospective study of the first 100 patients treated for Bariatric Surgery Unit of the Regional Hospital of Punta Arenas, Chile conducted from January 2007 to December 2010, under the GS technique associated SESIDDI performed by laparoscopy.

The group of 100 patients consisted of 19% of patients males and 81% female, with an average age of 35.7 years, Initial BMI-37.05, tobacco users in 30%, alcohol occasional consumption 10% and associated comorbidities are described in table II.

We analyzed the group studied variables (sex, age, preoperative BMI, comorbidities) as well as the technique used (surgical time, morbidity, mortality, conversion to open surgery and re operation). The advantages are shown in Table I.
**Tabla I: Advantages of the technique**

Simple (and Reproducible)
Shorter OR time
Fewer anastomosis
Lower Internas Hernias risk
Preservation of the antral pacemaker

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>HBP</td>
<td>28</td>
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<tr>
<td>DMT2</td>
<td>18</td>
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<tr>
<td>Insulina resistance</td>
<td>56</td>
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<tr>
<td>Fat liver</td>
<td>37</td>
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<tr>
<td>Dislipidemia</td>
<td>60</td>
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<td>Hyperthyroidism</td>
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<td>Asthma</td>
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<td>Sleep Apnea</td>
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**Technical description**

The procedure is performed with the patient in supine position under general anesthesia and non-invasive monitoring. In the OR WE use two monitors, one in the head and one to the right side of the patient. The surgeon stands between the patient's legs, the assistant on the left and the nurse on the patient right (Fig. 1).

Under general anesthesia the pneumo-peritoneum is done with the Veress needle in the left upper quadrant, the ports are inserted as shown in Fig. 1. A routine inspection of the abdominal cavity is done, and then the greater curvature sectioning of the gastro-epiploic vessels and short vessels until the cardias (making sure no hiatal hernia exist at the time of repair). Then we proceed in the same way preserve the distal part of the gastroduodenal artery in the back of the duodenal bulb which will limit the duodenal he sectioning, which is performed with automatic stapler blue load, and no reinforcement as routine of the distal stump (Fig. 2).

Then the Gs is then performed, being guided by a 34 F bougie, by sectioning the stomach with sequential firings of an automatic linear stapler (first yellow cartridge on the antrum and then remaining blue). Hemostasis is performed selectively using clips (Fig. 3).

This is done after the intestinal diversion. The Treitz ligament is identified and at 3 meters distally where the ileum starts we perform a end-to-side duodeno-ileal anastomosis hand-sewn manually with PDS 3/0; two layers in the back and single one in the front leaving an approximately 2 cm opening (Fig. 4 and 5).

Methylene blue is used for the leak test introducing it by the bougie and 2 closed aspiration drains covering the duodenal stump and the duodenum-ileal anastomosis and another on the GS staple-line.

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*Fig. 1. Ports arrangement: (1) Veress for pneumo-peritoneum, (2) Camera, (3,4 and 5) working ports (6) Liver retractor.*

*Fig. 2. Esquema de abordaje gástrico*
Postoperative management

Patients wander with assistance from the 4th hour post-surgery, begin feedings within 48 hrs with water + fractionated jelly and discharged at 72 hrs postoperative ingesting liquid regime.

Results

Mortalidad nula, y una morbilidad del 12% (tabla 3). Del total de complicaciones, solo 6 (6%) requirieron re intervención, sin trombosis venosa profunda ni de tromboembolismo pulmonar. No hubo conversión a cirugía abierta y el tiempo operatorio promedio fue de 75 ± 20 minutos.

Management of leaks:

There were 6 (6%) leaks (Table IV) managed medically in 50% and 50% required re-intervention. No fistula at duodenal stump or duodenal-ileal anastomosis.

Discussion:

The GS + SESDID is a new surgical technique based on the principles of the biliary-pancreatic diversion, which was amended in search of similar or better results than the original with a more simplified technique and decrease potential complications. There are Brazilian and Spanish bariatric centers working with this new technique and the preliminary results reported.

Keep in mind that being a new and innovative technique, the results will go hand in hand with an inevitable learning curve; which is expected to simpler and shorter and we will quickly reach the final results reported.

Improving the performance of this technique has gone hand in hand with the optimization of certain strategic points which are explained below:

a) Controlled Hypotension: To prevent bleeding at the time of stapler division and thus have a right visual field. Before the end of the surgery the anesthetist increases blood pressure demonstrating good selective hemostasis.

b) Local anesthetic infiltration of ports sites: Reduces the requirement of postoperative analgesia and its side effects of it (nausea, vomiting).

c) Duodenal Section: Use only blue cartridges instead the white ones.

d) Reinforcement of the GS staple-line is under discussion: We use hemostatic Clips selectively since reinforcement could contribute to a higher incidence of early stenosis of the GS. For these reasons, we abandoned strengthening routine gastric section line.

e) Early ambulation: Starting at the 6th hour post-op which is vital support nursing staff and the patient’s family. We had zero deep venous thrombosis and of pulmonary embolism, despite working with high risk thrombosis prone patients.

Through this work we want to convey our experience with this technique is that while new, it is rooted in widespread applied techniques in a more simplified way, and the preliminary results are quite encouraging in terms of WL (our series to three years soon to be published), to demonstrate that it is feasible, and that we have increased the arsenal of bariatric techniques to offer. Further study results regarding the medium and long term results will position this technique in the proper place.

Conclusions

This study group, although it is small and does not allow meaningful comparative studies, to demonstrate the feasibility of the technique, highlighting its advantages, and promote their dissemination of knowledge.

The GS + SESDID is feasible and reproducible, with the advantages already mentioned in relation to the RNY-GBP, associated with no mortality and low morbidity, being a new technique, goes hand in hand with the learning curve which theoretically should be more shortened as the simplification of the technique.

References: