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Results and complications of the laparoscopic adjustable gastric band in Bolivia

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Abstract:*Objective:* Evaluate the results and complications of the laparoscopy adjustable gastric banding (**LAGB**) in patients with excess corporal weight and/or comorbidity associated with obesity. *Patients and Methods:* Prospective longitudinal quasi-experimental study of 125 patients with Body Mass Index (**BMI**) > or equal to 40, or > o equal to 35 with co morbidities. The procedure was done by the Pars flaccid**a** technic. The post-operative follow up was 24 months, with a minimum of 12 and maximum of 36. The **statistical** analysis was done with SPSS.

Results: 65.1% were women and 34.9% male. The pre-operative weight was 13.9 kg and the BMI was 38.56. The percentage of excess weight loss **(%EWL**) in the first year was 59%, and at the third year the conversion rate for bleeding was 0.8%, the post-operative complications were pouch dilatation 25%; anterior sliding 3.7%, erosions 2.7% and reflux 3.7%.
Conclusions: The short term results were not ideal, although the LAGB should be consider**ed** as an alternative for surgical treatment for the obesity, always accompanied with a follow up of the multidisciplinary team, dietetic measures, exercises and psychological orientation.

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Introduction

La Laparoscopic Adjustable Gastric Band (**LAGB**) is a restrictive operation to treat morbid obesity if the Body Mass Index (BMI) is >40 or when >35 with comorbidities (high blood pressure, myocardium hypertrophy, hyperlipidemia, several types of cancer**,** cholelithiasis, sleep apnea, degenerative arthritis and psychological problems) if the BMI is >35[1]. Morbid obesity is a worldwide health problem with an increasing incidence and there are more than 300 million new obese people**. I**n the US nearly 6 million have a BMI >40 and another 10 million IMC>35 with associated comorbidities [3].
In Bolivia the incidence of obesity is 2.1% of the population is increasing continually. The restrictive operations are an option to lose weight long-term**,** because medical management has not been successful and does not correct comorbidities[6].
LAGB was introduced in 1993 with the advantages of being minimally invasive, adjustable and allows a gradual weight loss in the patient[7]. The short-term results were excellent with a low morbidity, almost no mortality and adequate weight loss (**WL**) [1,8,9]. Buchwald [10]in a multicenter study found that %EWL was 61.% in 61 O´Brien reports %EWL of 55% at 5 years, and 51.0% and 59.3% at 7 and 8 years.
Our objective is to determine the results with LAGB in patients with EW and comorbidities associated with obesity in Bolivia

Patients and Methods

The present study is quasi experimental, prospective and longitudinal. The Ethical Committee and the Continuous Medical Education Board of the Elizabeth Seton and San Pedro Clinic, Cochabamba, Bolivia have approved the study.
126 patients were included with a BMI>40 or if they had comorbidities (Diabetes, High blood pressure, hyperlipidemia) **with** a BMI>35. A multidisciplinary team evaluated the patients pre-op with labs, radiology, abdominal ultrasound, upper endoscopy, and psychological, metabolic, nutritional, cardiologic and endocrine evaluation
The clinical history, demographic data, associated co morbidities; pre & post op weight and BMI, intra and post-op complications were accounted.
All patients had general anesthesia, three doses of prophylactic antibiotics (cephalosporin) and a daily dose of low-molecular heparin. Lap-band or VG (Allergan, Santa Bárbara, CA) the Swedish (SAGB; Optech Medical) by laparoscopy were done, by the Pars Flacida technique [7,8]. Adjustments were done under barium control the first time and later at the office depending on the patient's symptoms as hunger sensation or increase **i**n the intake. 108 patients (85.7%) received follow-ups, 18 (14.3 %) were lost at 24 months.
Patients were followed with a mean of 24 months, 12 m minimum and 36 maximum. They were **seen** at consultation at 1, 2 and 6 weeks**,** during the first year and finally 3 times a year for the second and third. Weight, BP, symptoms related to the GB**,** post-op

complications and labs (CBC, glucose, BUN, creatinine, cholesterol, triglycerides, total protein and Albumin)
A SPSS -17 program was used for the statistical analysis with the mean, standard deviation and t-Student test.

Results
Of the 126 patients, 65.1% (n=82) were females and 34.9% (n= 44) males. Pre-op Weight 103.17 ± 13.9 **kg** and Initial BMI mean 38.56±4.5. Ver Table 1.

Patients (n)	**126**
M/F (n)	44:82
Age	37.59± 7.6
Weight in Kilos	103.17± 13.9
BMI	38.56±4,5

Table 1 Preoperative

Only one case required conversion to open technique, 0.8%, due to bleeding when doing the retro - gastric tunnel and the band was placed at laparotomy. The %EWL was 65% (n=126) in the first year and 59% (n=71) by the 3rd year. WL and BMI are shown in Table 2 comparing males /females, and in Table 3 the comparison between both sexes. The comorbidities are in Table 4 including DM2
Only the major complications required a second operation and minor if they did not. Dilation of the pouch was present in 25% (n=27) of the patients and they were treated by medical means and deflation of the band, 3.5% (n=4) had GERD, 2.7% (n=3) erosions, 3,7% (n=4) anterior slippage treated by laparoscopy, re-positioning the band in 3 cases and removing it in 1 case. The mean in between the operation and re-operation was 15 months (8 to 21 months) Table 5. Less than 1% **of** patients **suffered from** dysphagia and 12% from vomiting.

BGAL	**n=108**
Pouch Dilation	27(25%)
Anterior slippage	4(3,7%)
Erosions	3(2,7%)
GERD	4(3,7%)

Table 5 Short-term complications

Discussion
Obesity has increased worldwide[13]. Obesity leads to a higher morbidity and lower life expectancy. Medical management with diets, exercise, and medications generally works in between 5-10% of the cases and 90% of those cases regain their original weight within 3 to 5 years[14]. Weight loss surgery is effective and obtains adequate weight losses [15, 16, 17], reducing morbidity and mortality obesity-related[19]. Ideally bariatric surgery should be low risk, have prolonged weight loss over 50% of %EWL in 80% of the patients for more than 5 years, with good quality of life, low re-operation indexes, reversible and reproducible.[20, 21]. LGB was introduced more than 17 years ago and the early results were excellent[20, 21]
The %EWL of patients with LAGB goes from 49.4% at 34 months, 55% at 5 years, 51% at 7 years, 59,3% at 8 years and up to 61.8% at 9 years. The comparative results of this work are similar to the international numbers[22], except at 36 months, which is a little bit higher.
It is important to mention that the EWL is low in between 24-36 months, and this should be explained to the patient before surgery to force him/her to be strict in the dietetic and exercise recommendations from the beginning. WL is similar in males and females (Table 3) and LAGB is favorable to both. The good results in the comorbidities were favorable at 12 months but decreased at 36 months (Table 4). This is why the multidisciplinary team is so important to use coadjutant measures to prevent progression of the comorbidities. 33.1% of the patients had a surgical complication short- or medium-term such as 33-21%, erosions 9.5%, slippage 20.5% and port-related problems 7.6%[25]. The frequency and % of the post-op complications in this work were less except for dilation of the pouch, which is higher. All these complications can be resolved and controlled by laparoscopy, and are related to the technical details of the placement of the LAGB, and the experience of the surgical team determine the % and frequency of the complications.
In conclusion, even if the expected final mid-term results on WL and comorbidities are not ideal and the post-op complications occur in **one**-third of the patients, LAGB should be considered a good option in the surgical management of obesity, if performed by a dedicated multidisciplinary team and complemented with diet, exercise and psychological orientation.

Conflicts of interest. - The primary author is the Chief of Surgery of the Hospital Elizabeth Seton, where the study has been carried out.

Months	Mean (kg)	Minimal (kg)	Maximal
12	83.19±6,903 (n=126)	63	115
24	81.27±7,709 (n=108)	61	102
36	79,44 ± 9,086 (n=71)	60	110

Table 2. WL &IMC

Data	Female	P value
Pre-op(Kg)	101,55±14,3 (n=82)	0,000
At 12 m (Kg)	81,95±6,2 (n=82)	0,000
At 24 m (Kg)	80,52±7,1 (n=69)	0,000
At 36 m (Kg	78,16±2 (n=44)	0,000

Table 3. Post-op by sex

Comorbidities	Pre-op n=126	12 m n=126	36 m n=71
Diabetes		0,8 %	
HBP	4% (n=5)	(n=1)	
Hyperlipidemia	4,8% (n=6)	1,6 %	8 % (n=2
TOTAL	11,9 %	(n=2)	2 % (n=3
	(n=15)	1,6 %	2 % (n=3
	20.7 %	(n=2)	,2 % (n=8
	(n=26)	4,0 %	
		(n=5)	

Table 4 Associated Comorbidities

References.

1. Nehoda H. Weiss H. Labeck B. et al. Results and complications after adjustable gastric banding in a series of 250 patients. Am J Surg. 2001;181(1):12-5.
2. Mitka M. Surgery for Obesity: demand soars amid scientific, ethical questions. Jama. 2003; 289(14):1761-2.
3. Tessier DJ. Eagon JC. Surgical management of morbid obesity. Curr Probl Surg. 2008; 45(2):68-137
4. Instituto Nacional de estadistica. Censo del Estado Plurinacional de Bolivia octubre del 2009.
5. Bjorntorp P. Results of conservative therapy of obesity: correlation whit adipose tissue morphology. Am J Clin Nutr. 1980;33(2 Suppl):370-5.
6. Fisher BL. Achauer P. Medical and surgical options in the treatment of severe obesity. Am J Surg. 2002; 184(6B);9S-16.
7. Favretti F. Ashton D. Busetto L. The Gastric band; first choice procedure for obesity surgery. World J Surg. 2009;33(10):2039-48.
8. Suter M. Giusti V. Heriaef E. et al. Early result of laparoscopic gastric banding compared with open vertical banded gastroplasty. Obes surg. 1999; 9(4):374-80.
9. Victorzon M. Tolonen P. Laparoscopic silicone adjustable gastric band: initial experience in Finland. Obes Surg. 2000;10(4)369-71.
10. Buchwald H. Avidor Y. Braunwald E. et al. Bariatric Surgery: a systemic review and meta-analysis. JAMA. 2004;292(14):1724-37.
11. O´Brien PE. McPhail T. Chaston TB. et al. Systemic review of medium-term weight loss after bariatric operations. Obes Surg. 2006; 16(8):1032-40.
12. Busseto L. Segato G. De Marchi F. et al. Outcome predictors in morbidly obese recipients of an adjustable gastric band. Obes Surg. 2002;12(1):83-92.
13. Dixon JB. O´Brien PE. Changes in comorbidities and improvement in quality of life afeter LAP-BAND placement. Am J Surg.2002; 184(6B):51S-4S.
14. Solomon CG. Dluhy RG. Bariatric Surgery: Quick fix or long-term solution? N Engl J Med. 2004; 351(26):2751-3.
15. Nehoda H. Surgical management of obesity. Wien Klin Wochenschr 2002; 114(17 –18): 744-7.
16. Buchwald H. Williams SE. Bariatric Surgery worldwide 2003. Obes Surg. 2004; 14(9): 1157-64.
17. Deitel M. Shikora SA. The development of the surgical treatment of morbid obesity. J Am Coll Nut. 2002;21(5):365-71.
18. Schneider BE. Mun EC. Surgical management of morbid obesity. Diab Care. 2005;28(2):475-80.
19. Favretti F, Cadiere GB. Segato G. et al. Laparoscopic placement of adjustable silicone gastric banding: early experience. Obes Surg. 1995;5(1):71-3.
20. Gastrointestinal Surgery for severe obesity. National Institutes of health consensus development conference draft statement. Obes Surg.1991; 1: 257-65.
21. Manterola C, Pineda V. Vial M. et al. Surgery for morbid obesity: selection of operation based on evidence form literature review. Obes Surg. 2005; 15(1): 106-13.
22. Garb J, Welch G,Zagarins S, Kuhn J, Romanelli J. Bariatric Surgery for the Treatment of Morbid Obesity: A Meta-analysis of Weight Loss Outcomes for Laparoscopic Adjustable Gastric Banding and Laparoscopic Gastric Bypass. Obesity Surgery 2009; 19(10): 1447-55
23. O´Brien PE. McPhail T. Chaston TB. et al. Systemic review of medium-term weight loss after bariatric operations. Obes Surg. 2006; 16(8):1032-40.
24. Buchwald H. Avidor Y. Braunwald E. et al. Bariatric Surgery: a systemic review and meta-analysis. JAMA. 2004; 292(14):1724-37.
25. Suter M, Calmes JM, Paroz A, Giusti V. A 10-year Experience with Laparoscopic Gastric Banding for Morbid Obesity: High Long-Term Complication and Failure Rates. Obesity Surgery 2006; 16(7): 829-35