

**Case Report**

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Weight Regain after Bariatric Surgery - Argon Plasma Coagulation for Gastrojejunal Anastomosis Decrease

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Introduction

The weight regained has been a described growing problem in patients after bariatric surgery, especially at long term. This weight regained is multifactorial and often associated with dilation of Gastrojejunostomy (GJ), allowing a faster gastric emptying and therefore greater food intake [1,2]. For the patients with significant weight regain after failed conservative approach, some revisional procedures had been attempted and more recently endoscopic revisional procedures had been described [3,4].

Aims and Methods

To evaluate the safety and effectiveness of Argon Plasma Coagulation (APC) decreasing the diameter of the gastroenteric anastomosis in patients who have undergone RYGB for morbid

obesity and regained weight associated to dilation of the GJ. From Jan-2014 to April-2017 554 RYGB subjects with weight regain a dilated anastomosis (>18mm) and at least 2 years from procedure were submitted APC application [5-7]. In relation to the anastomotic

diameter, the majority of studies use a diameter of more than 20 mm to define anastomosis dilation, although some studies use smaller diameters such as 12 mm, similar to that created manually in the gastrojejunal anastomosis using a 36 Fr Fouchet bougie [8,9]. In the patients in the present study, the minimum cross-section diameter was 18 mm and the maximum measured in the first session 40 mm [10]. This anastomotic diameter was measured using a 33-mm long Olympus® articulated device [11]. Interval between an APC session was 60 days with a maximum of 03 applications. APC set was at 2-3L/m with 65-85W. GJ diameter target was 8-12mm estimated with pre-measured grasper [12-14]. At first APC session, pre-op weight and BMI, post-op weight nadir, actual weight and BMI and estimated diameter of GJ were the variables collected [15,16]. Complications during treatment were also collected. In the present study, psychological and nutritional evaluations were performed before APC and during treatment and physical activity was strongly recommended [17,18]. Data were analyzed with descriptive statistics, student's t test and Spearman correlation [19,20] (Figure 1-10).

Patients with dilatation in the
1st application 28/664

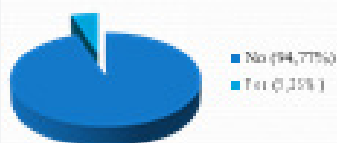


Figure 1:

Patients with dilatation in the
2nd application 18/626



Figure 2:

Patients with dilatation in the 3rd
application 04/488

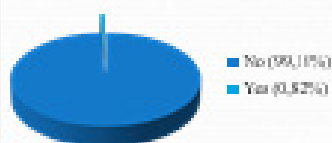


Figure 3:

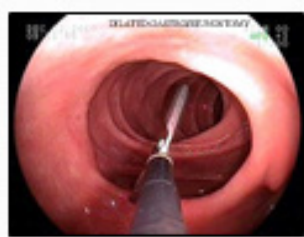


Figure 4:



Figure 5:



Figure 6:



Figure 7:

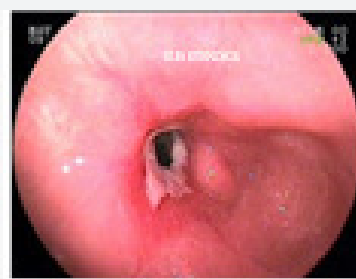


Figure 8:



Figure 9:



Figure 10:

Results

Of the 554 patients, 79.06% were women and 20.94% were men. Average time between bariatric surgery and the first APC was 96.35 months (± 42.17) and average weight regained in this interval was 22,08kg ($\pm 11,05$) [21-23]. The mean diameter of the anastomosis was 24.78mm ($\pm 6,04$) and the average number of APC sessions were 1.78 times ($\pm 0,61$). The average reduction of anastomotic diameter was 14.86mm ($\pm 7,24$) and the final average diameter was 11,79mm ($\pm 3,89$) [24,25]. The average weight loss between the first and last APC was 13,37kg ($\pm 7,82$) and the average decrease of BMI was 4,59kg/m² ($\pm 2,78$). 122 patients (22,02%) did not achieve the target GJ diameter and 05 patient (0,9%) did not lose weight even with the desired GJ diameter [26-29]. From the 146 subjects (26,36%) followed up to 12 months, the weight regain was less than 20% of the weight loss. Of the 554 patients APC, 51 (9,2%) required dilatation balloon due to symptomatic stenosis at least once (Table 1).

Table 1

T-Test for Comparison of Patients with and without Dilatation in any of the Coagulation					
	Dilation	N	Average	S.D.	p-value
Age	No	503	37,63	9,17	<0,001
	Yes	51	33,08	9,02	
Height	No	503	1,66	0,08	0,993
	Yes	51	1,65	0,08	
Weight before Operation (RYGB)	No	503	107,88	23,16	0,044
	Yes	51	118,27	12,53	
Less Weight Reached after Operation	No	503	73,96	14,08	0,382
	Yes	51	74,55	12,80	
Time after Operation (months)	No	503	96,35	42,17	0,161
	Yes	51	88,23	41,66	
Weight Regain after Operation (kg)	No	503	22,08	11,05	0,365
	Yes	51	21,68	8,64	
Weight before Argon Plasma Coagulation	No	503	94,82	16,48	0,861
	Yes	51	91,78	15,52	
BMI before Argon Plasma Coagulation	No	503	39,67	7,23	0,012
	Yes	51	42,19	4,26	
Initial Diameter of the Anastomosis (mm)	No	503	25,00	6,40	0,495
	Yes	51	24,00	8,19	
Diameter of the Anastomosis after the 1st Coagulation (mm)	No	525	19,00	3,93	<0,001
	Yes	29	8,00	5,57	
Diameter of the Anastomosis after the 2nd Coagulation (mm)	No	507	15,00	3,24	<0,001
	Yes	18	7,00	3,23	

Diameter of the Anastomosis after the 3rd Coagulation (mm)	No	489	12,00	2,22	0,006
	Yes	4	7,00	3,54	
Final Diameter of the Anastomosis (mm)	No	503	12,00	3,89	0,566
	Yes	51	10,00	1,63	
Reduction of the Anastomosis (mm)	No	503	14,86	7,24	0,369
	Yes	51	17,03	4,79	
Weight after Last Coagulation	No	503	81,88	14,44	0,007
	Yes	51	74,55	15,66	
BMI after Last Coagulation	No	503	28,07	3,95	0,001
	Yes	51	26,89	4,70	
Weight Loss between 1st and Last Coagulation (%)	No	503	13,37	7,82	<0,001
	Yes	51	19,31	7,21	
BMI Reduction	No	503	4,59	7,30	<0,001
	Yes	51	6,87	4,21	
Reduction Anastomosis (Between 1st and 2nd Coagulation) (mm)	No	525	5,92	2,25	0,001
	Yes	29	12,75	8,48	
Reduction Anastomosis (Between 2nd and 3rd Coagulation) (mm)	No	507	4,20	0,79	0,801
	Yes	47	2,50	7,78	
Coagulation to Anastomosis Less or Equal to 12mm	No	381	11,88	0,54	0,087
	Yes	51	10,23	0,44	

Patients with dilation in the 1st application		
	N	%
No	525	94,77
Yes	29	5,23
Total	554	100,0
Patients with dilation in the 2nd application		
	N	%
No	507	96,58
Yes	18	3,42
Total	525	100,0
Patients with dilation in the 3rd application		
	N	%
No	489	99,18
Yes	4	0,82
Total	493	100,0

Conclusion

Argon Plasma Coagulation (APC) has been shown to be an effective and safe endoscopic technique for the reduction of gastroenteric anastomosis in patients undergoing bariatric surgery who have regained weight with dilation of the anastomosis. The reintroduction of the patient to the multidisciplinary team is mandatory in cases of weight regain and loss to postoperative follow-up. A psychological and/or psychiatric evaluation is mandatory, as

well as nutritional therapy and encouragement of physical activity. The monitoring of food intake and body weight, closer follow up of the operated patients, appropriate choice of technique according to the patient and the experience of the surgeon, and a good learning curve are all factors that can reduce the failure rate of bariatric surgery. The reintroduction of the patient to the multidisciplinary team is mandatory if better results and sustainable weight loss and comorbidity control are to be obtained.

Acknowledgement

None.

Conflict of Interest

No conflict of interest.

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