The outcome results in patients with type 2 diabetes mellitus and obesity after either adjustable gastric banding (AGB) or Roux-en-Y (RNY) gastric bypass

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Abstract

The prevalence of the type 2 diabetes and obesity are on the rise globally. Initial interventions for these groups of patients remain diet, exercise and medications. If these measures are insufficient gastrointestinal surgery offers a very good alternative for obesity and type 2 diabetes treatment.

We report the outcome results for patients who underwent either adjustable gastric banding (AGB) or Roux-en-Y (RNY) gastric bypass in the years 2009-2012.

Out of 33 patients (7 men, 26 women, average age 48.4 yrs), 11 underwent AGB and 22 had RNY. Preoperatively there were no statistically significant differences in: weight, excess of weight, Body Mass Index (BMI), HbA1c, blood pressure between AGB and RNY subgroups.

In the AGB subgroup the following results were obtained 6 months after the operation: average loss of weight (LOW) 10.87 kg, 18.18 % achieved 50% estimated weight loss (EWL), 0 % achieved 70% EWL. We observed HbA1c reduction of 5.66 mmol/mol. 12 months after the operation average LOW was 14.8 kg, 9.09 % achieved 50% EWL, 0 % achieved 70% EWL. We observed HbA1c reduction of 7.41 mmol/mol and reduction in BP of 9.6/5.6 mmHg.

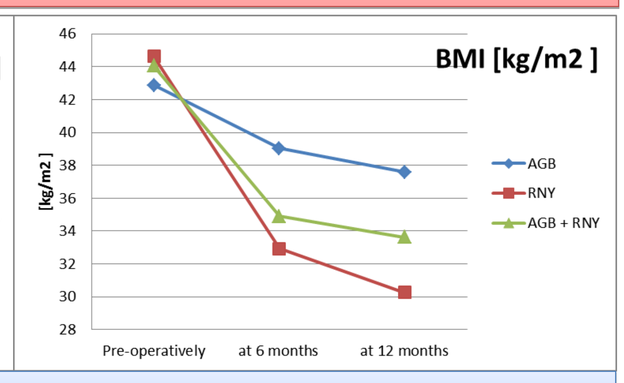
In the RNY subgroup 6 months after operation the results were as follows: average LOW 30.9 kg, 71.43 % achieved 50% EWL, 23.81 % achieved 70% EWL. We observed HbA1c reduction of 24.1 mmol/mol.

12 months after the operation average LOW was 39.95 kg, 100 % achieved 50% EWL, 58.33 % achieved 70% EWL. We observed HbA1c reduction of 13.27 mmol/mol. We observed overall reduction in BP 12.5/4.95 mmHg

The results show significantly better achievement of EWL and reduction in HbA1c in the RNY subgroup. These results were more sustainable in RNY group 12 months after the operation. Our report supports the more favourable outcomes in patients undergoing RNY gastric bypass procedures.

Introduction

Obesity [body mass index (BMI) ≥30 kg/m^2] [1,2], is associated with increased risks of type 2 diabetes, stroke, ischaemic heart disease, liver disease, cancers, osteoarthritis, obstructive sleep apnoea and depression. Initial interventions for patients with obesity remain diet, exercise and medications. If these medical and behavioural approaches are insufficient there is a role for bariatric surgical procedures which become increasingly common worldwide [3].



Following bariatric surgical operations we observed improvement in both HbA1c and blood pressure measurements.

Group characteristics (Pre-operatively)

33 patients (7 males, 26 females)
Bariatric surgery in years 2009-2012 (AGB or RNY)

		AGB	RNY	AGB + RNY
	Number of patients	11	22	33
Average	Age [years]	53.09	46.09	48.4
	Weight [kg]	120.94	121.72	121.46
	Weight excess [kg]	50.2	52.6	51.8
	BMI [kg/m^2]	42.86	44.63	44.04
Avarage values Pre-operatively	Systolic blood pressure (SBP) [mmHg]	136.4	140.2	138.3
	Diastolic blood pressure (DBP) [mmHg]	80.6	83.9	82.2
	HbA1c [mmol/mol]	58.3	62.9	61.42
	HbA1c [%]	7.49	7.9	7.77

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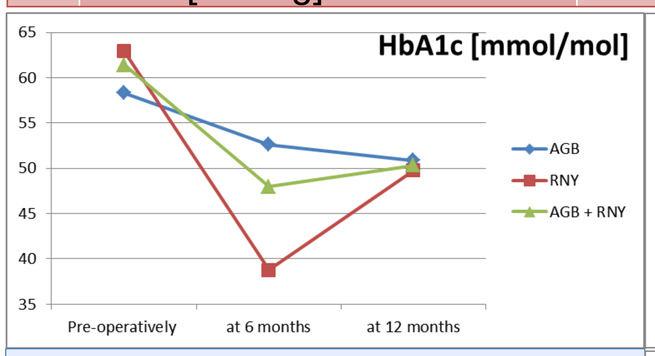
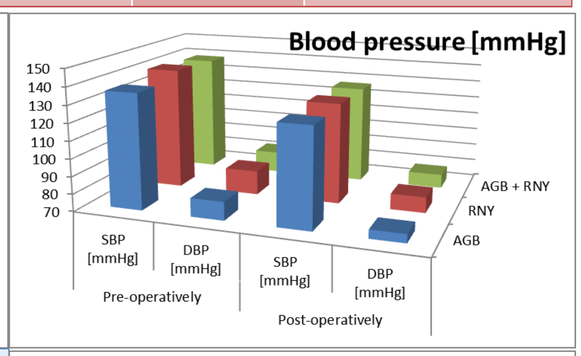
HbA1c and BP improvement after surgery

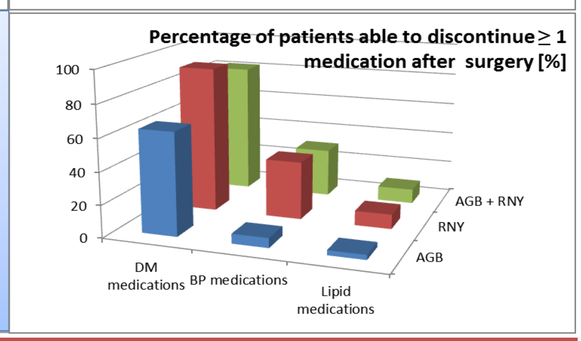
		AGB	RNY	AGB + RNY
Average	**6 months**			
	HbA1c [mmol/mol] reduction	5.66	**24.1**	13.46
	12 months			
	HbA1c [mmol/mol] reduction	7.41	**13.13**	11.09
	BP after operation			
	SBP [mmHg] reduction	9.6	**12.5**	11.5
	DBP [mmHg] reduction	5.6	4.95	4.2





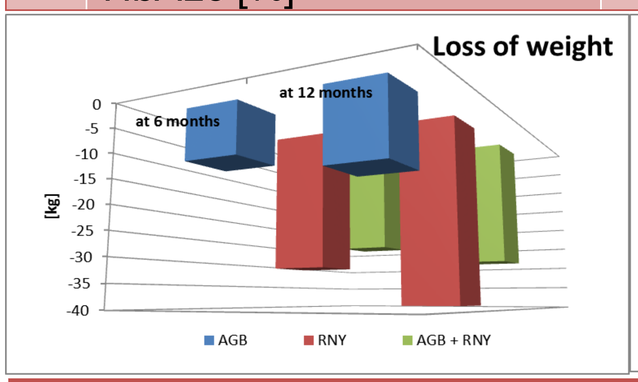
RESULTS

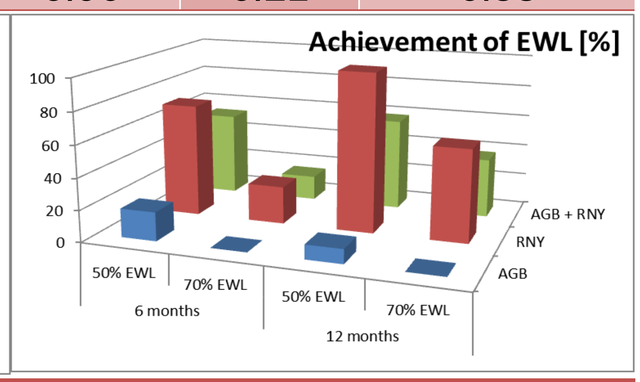
Bariatric surgery enabled some of the patients to discontinue treatment for their diabetes, blood pressure and lipid profile. Patients in RNY subgroup were able to discontinue significantly more medications comparing with AGB subgroup.



6 months after surgery

		AGB	RNY	AGB + RNY
Average	Weight [kg]	110.06	90.63	96,9
	Weight loss [kg]	10.87	30.9	24.3
	BMI [kg/m^2]	39.04	32.92	34.9
	50% estimated weight loss (EWL) achieved [%]	18.18	**71.4**	53.1
	70% EWL achieved [%]	0	**23.81**	15.6
	HbA1c [mmol/mol]	52.64	38.8	47.96
	HbA1c [%]	6.96	6.21	6.53





12 months after surgery

		AGB	RNY	AGB + RNY
Average	Weight [kg]	106.05	82.87	93.78
	Weight loss [kg]	14.88	39.35	28.8
	BMI [kg/m^2]	37.59	30.26	33.62
	50% EWL achieved [%]	9.09	**100**	58.3
	70% EWL achieved [%]	0	**58.33**	37.5
	HbA1c [mmol/mol]	50.89	49.78	50.3
	HbA1c [%]	6.8	6.72	6.76

Discontinued medications after surgery

		AGB	RNY	AGB + RNY
Average number of medications/patient	Discontinued medications for DM	0.64	**1.41**	1.15
	Discontinued medications for BP	0.27	**0.41**	0.36
	Discontinued medications for lipid control	0.09	0.09	0.09

Discussion

Our results support bariatric surgery as a beneficial procedure in management of patients with obesity and diabetes when medical and behavioural approaches prove insufficient. This is concordant with reports from other authors [4, 5, 6].

Our results show significantly better outcomes in the RNY subgroup in achievement of EWL, reduction in HbA1c and systolic blood pressure. These results are also more sustainable in RNY group 12 months after the operation.

RNY subgroup patients were able to discontinue significantly more medications taken prior to operation, especially for diabetes and blood pressure control, when compared with AGB subgroup. This particular outcome has significant impact on the life long savings on medications cost.

Our report supports the more favourable outcomes in patients undergoing Roux-en-Y (RNY) gastric bypass procedures compared with adjustable gastric banding (AGB).

References:

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