

#492; USE OF THE MEDTRONIC 780G HYBRID CLOSED-LOOP SYSTEM DURING LAPAROSCOPIC GASTRECTOMY. A CASE REPORT.

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Background and Aims

Bariatric surgery is a well-established treatment option for people with type 1 diabetes and obesity but peri-operative management of blood glucose is challenging. Here we report continued use of the Medtronic 780G advanced hybrid closed-loop system during laparoscopic sleeve gastrectomy.

Methods

A 45-year-old woman with type 1 diabetes for 38 years, treated proliferative retinopathy and hyperlipidaemia. HbA1c dropped from 8.0% to 7.3% on commencing MiniMed™ 780G closed-loop system. After gaining 6Kg, she weighed 81Kg with worsening obesity and BMI 34.4Kg/m², she opted for laparoscopic sleeve gastrectomy (LSG). Two weeks before surgery, she commenced the liver shrinkage diet. SmartGuard™ target changed from 110mg/dL to temporary target 150mg/dL, active insulin time remained 2 hours. Ambulatory glucose profile reviewed remotely every week.

Results

After liver shrinkage diet, TIR 73% from 62% with TBR 1% from 0% (**Figure 1**). Average sensor glucose 152mg/dL from 173mg/dL. GMI 6.9% from 7.4%. Coefficient of variation 32.8% from 38.3%. On day of surgery, she continued temporary SmartGuard™ target 150mg/dL (**Figure 2**). Intra-operative hyperglycaemia resolved on returning to SmartGuard™ target 110mg/dL postoperatively. One day post op, TIR 92% without hypoglycaemia (**Figure 3**). There has been continued improvement in her AGP following surgery (**Figure 1**). Total daily insulin dose dropped gradually from 80.9units to 21.8units. Carbohydrate ratio increased from 6 to 10 and SmartGuard™ target changed from 110mg/dL to 120mg/dL. Active insulin time remained 2 hours. 3 months after surgery, HbA1c 6.8%, weight 69Kg and BMI 29Kg/m².

Figure 1 – Summary of AGP Pre- Peri- and Post-Surgery

	Pre liver shrinkage diet	Post liver shrinkage diet	Day of operation	1 day post LSG	2 weeks post LSG	4 weeks post LSG
Time in range	62%	73%	61%	92%	94%	88%
Time below range	0	1%	0	0	1%	0
Glucose Management Indicator	7.4%	6.9%	-	-	6.3%	6.6%
Coefficient of variation	38.3%	32.8%	-	-	27.9%	25.5%
Total daily dose insulin	80.9units	68.8units	-	-	23.7units	21.8units

Figure 2 –Day of surgery

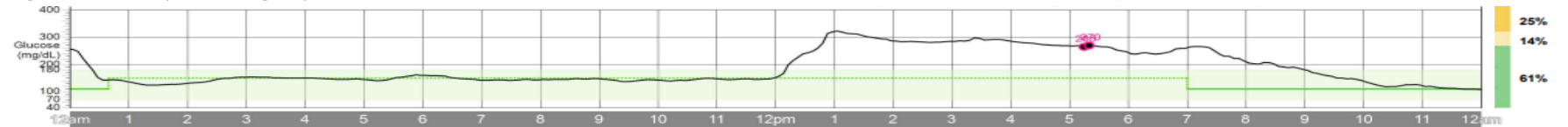
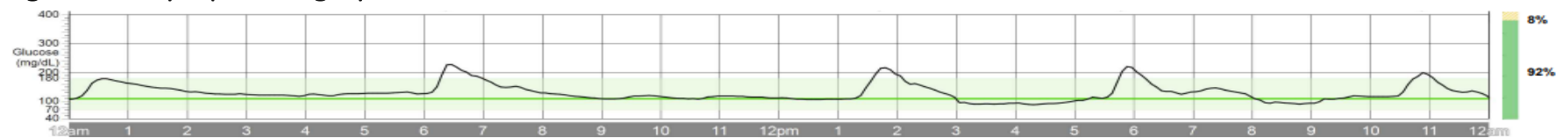


Figure 3 –Day 1 post surgery



Conclusions

This case demonstrates successful use of a hybrid closed-loop system in a person with type 1 diabetes undergoing weight loss surgery. Further research in a larger cohort of patients is required.