Single Catheter for Duodenal Mucosal Resurfacing Demonstrates Similar Safety Profile With Improved Procedure Time When Compared to Original Dual Catheter: Multicenter Study of Subjects With Type 2 Diabetes

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Background

Abnormalities in duodenal mucosa, nutrient absorption, and enteroendocrine cells in patients with type 2 diabetes (T2D) are thought to play pathophysiological roles in the insulin resistance signal. Duodenal Mucosal Resurfacing (DMR) is an endoscopic procedure that resurfaces the duodenal mucosa via hydrothermal ablation exerting metabolic benefit by likely modifying nutrient-mucosa signalling. DMR is being investigated as a treatment for metabolic diseases including T2D. The safety and efficacy of the original DMR dual-catheter system have been previously described[1], and an integrated single-catheter system has since been developed.

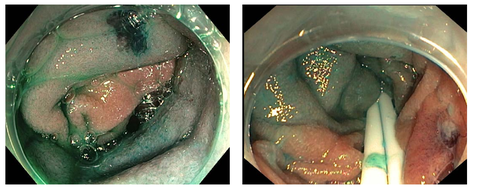
Objective

To compare DMR procedural performance and safety between the two catheter systems in patients with uncontrolled T2D.

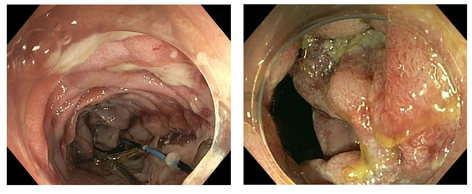
Methods

Duodenal Mucosal Resurfacing

Step 1. Duodenal lumen lifting



Step 2. Mucosal circumferential ablation

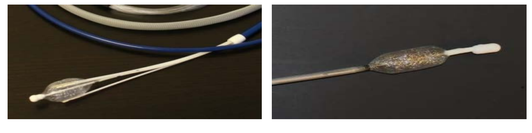


Primary safety endpoints Device/procedure-related serious adverse events (SAEs), Unanticipated adverse device effects (UADEs), Hypoglycemic events

Procedure success 3 and 5 ablations per pt. with dual- and single-catheters

Single-catheter system
Used in REVITA-1b (R1b) & 2nd cohort first-in-human (FIH) trial

Dual-catheter system
Used in REVITA-1a (R1a) trial



Results

Dual-catheter R1a cohort: age 55.4±9 y, BMI 32.3±4.3 kg/m^2, HbA1c 8.5±1.0% (mean±SD)
Single-catheter R1b & FIH cohort: age 58.1±6.8 y, BMI 30.8±4.3 kg/m^2, HbA1c 8.3±1.1% (mean±SD)

- Similar procedure success for both catheters
- Single-catheter (Table 1):
  - Reduced procedure time
  - Numerically lower rate of AEs

One patient experienced a SAE (increased C-reactive protein), possibly related to the procedure and one patient experienced a severe AE (angina due to increased oxygen demand) with unknown relation to device/procedure.

Table 1. Procedure details and AEs

	Single-catheter n (%)	Dual-catheter n (%)
N	23	28
Procedure success	111/115 (97)	80/84 (95)
Mean procedure time (min), IQR	52min, 45	79min, 53
Overall AEs	18 (78.2)	24 (85.7)
Overall SAEs	1 (4.3)	0 (0.0)
Severe AE	1 (4.3)	0 (0.0)
Procedure related AEs	12 (52.1)	16 (57.1)
Possibly procedure related	4 (17.4)	9 (32.1)
Probably procedure related	5 (21.7)	7 (25.0)
Definitely procedure related	3 (13.0)	7 (25.0)
Device/procedure-related SAEs	0 (0.0)	0 (0.0)
Device/procedure-related UADEs	0 (0.0)	0 (0.0)
Hypoglycemia	0 (0.0)	2 (7.1)

Gastrointestinal disorders (abdominal pain, diarrhea, nausea) were the most common AEs which generally occurred within 0-3 days of the procedure and were resolved (Table 2).

Table 2. Most frequent AEs by system organ class

	Single-catheter n (%)	Dual-catheter n (%)
Gastrointestinal disorders	13 (56.5)	17 (60.7)
Musculoskeletal and connective tissue disorders	3 (13.0)	8 (28.6)
Respiratory, thoracic and mediastinal disorders	0 (0.0)	6 (21.4)
General disorders	3 (13.0)	5 (17.9)
Metabolic and nutrition disorders	2 (8.7)	4 (14.3)
Infections and infestations	2 (8.7)	4 (14.3)

Conclusion

The procedure success was comparable between the dual- and single-catheters, with numerical reduction in the procedure time and AEs using the single-catheter.

[1] Rajagopalan, Cherrington et al. Diabetes Care 2016