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Background

Abnormalities in duodenal mucosa, nutrient absorption and enteroendocrine cell population are thought to play a pathophysiological role in the development of insulin resistance in patients with type 2 diabetes (T2D). Duodenal Mucosal Resurfacing (DMR) is an endoscopic procedure that has been shown to improve glycaemic control at 6 months in T2D patients in a single centre first-in-human study.¹

Objective

To report the 6 and 12 month safety and efficacy data of the first multicentre study involving DMR.

Methods

Study Single arm, open label, prospective, multicentre study.

Subjects Patients with T2D (HbA1c 7.5-10.0%; age 25-75y; BMI 24-40kg/m²) using only oral glucose lowering medication.

Intervention Endoscopic DMR procedure entailing catheter based, post-papillary (clip marking, Fig 1) duodenal mucosal lifting (Fig 2) followed by circumferential hydrothermal ablation over 9-10 centimetres (Fig 3).



Glucose lowering medication Stable for ≥ 6 months post DMR. Adjusted according to care guidelines thereafter.

Follow-up measurements Adverse events, glycaemic control (HbA1c and fasting plasma glucose [FPG]), insulin resistance (HOMA-IR), and liver enzymes (AST and ALT) were determined at baseline and 1, 3, 6, 9, 12 months post DMR.

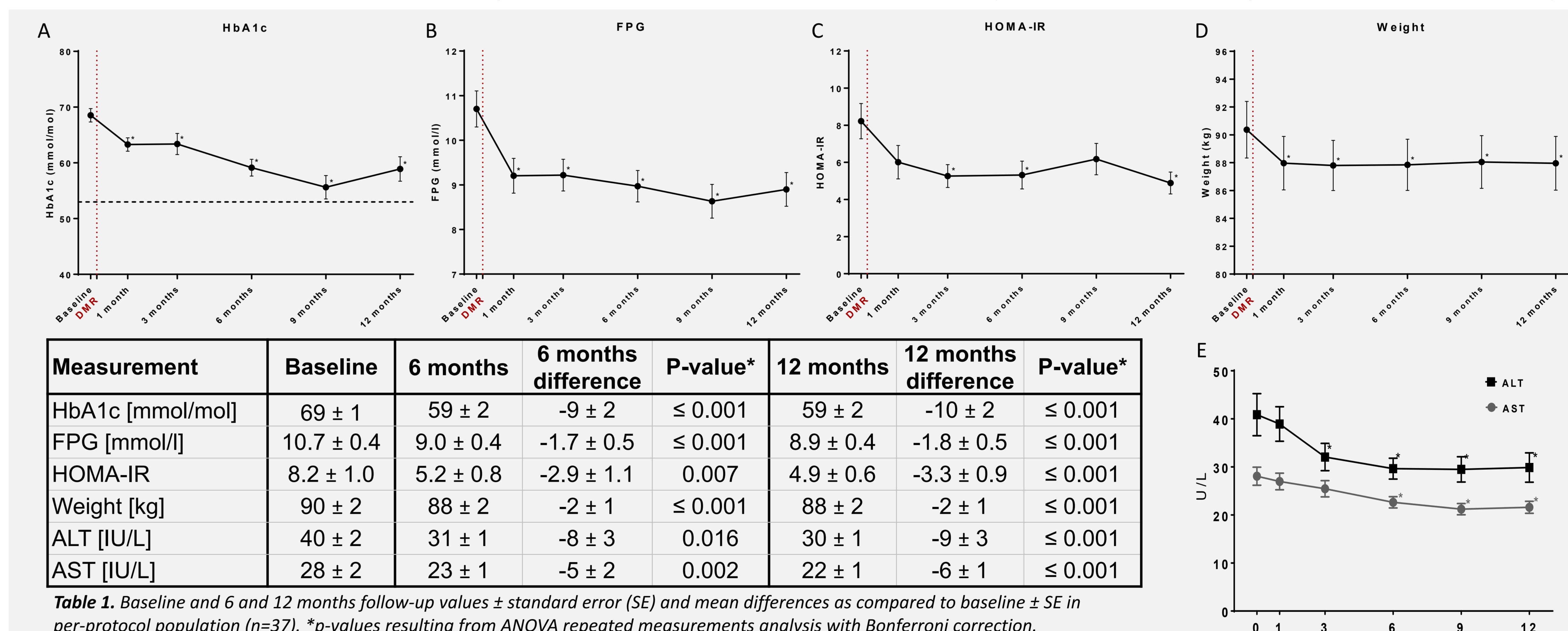
Statistical analysis ANOVA for repeated measurements with Bonferroni correction. Values are mean ± SE.

Results

Baseline characteristics (n=46) are 63% male, mean age of 55 years [range 31-69], mean T2D duration of 6 years [range 0.1-12]), and mean BMI 31.6±4.3 kg/m². DMR (9-10 centimeters of duodenal ablation) was complete in 37 subjects (per-protocol population, efficacy analysis).

Safety DMR was well tolerated in all 46 patients. Eight serious adverse events (SAEs) were reported. Non were considered device-related. One was considered procedure-related: Mildly elevated body temperature (38°C) with an increase in C-reactive protein starting one day post-DMR (one extra day of hospitalization for observation).

Efficacy Metabolic indices improved after DMR. Baseline, 6 and 12 month post DMR follow-up values of HbA1c, FPG, HOMA-IR, weight, ALT and AST with absolute differences and significance levels (as compared to baseline) are shown in Table 1. Figure A-E show the course of these parameters during 12 months follow-up.



Conclusion

Endoscopic DMR was found to be safe and effective in patients with suboptimally controlled T2D using oral glucose lowering medication. DMR elicited a substantial improvement in parameters of glycaemia as well as a decrease in liver transaminase levels up to 12 months post-procedure, suggesting considerable potential of DMR for the treatment of T2D.