High intensity focused magnetic therapy evaluated by Magnetic Resonance Imaging (MRI): safety and efficacy study of a dual tissue effect based non-invasive abdominal body shaping

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Objective: physicians are facing increasing demand for body contouring, creating pressure for emergence of innovative methods to deliver aesthetic improvement non-invasively to a wide range of patients. This study evaluates the efficacy of a high intensity focused magnetic technology (XXX, BTL Industries, Boston MA) for abdominal body shaping as a new way of treating patients in aesthetic practices.

Materials and Methods: in total 13 patients (5 female, 8 male, average age 36.0, BMI 24.8 kg/m2) received 4 treatments over umbilicus, 30 minutes each, separated by 2-3 days. Anthropometric evaluations were recorded and digital photographs were taken. The MRI without contrast determined by vertebrae T12 and S1 (FIESTA and FSPRG sequences) was used to measure fat and abdominal muscle thickness before the treatments and 2 months (±10 days) after the last procedure, in order to assess anatomical changes in abdominal tissues as a consequence of the application.

Results: all patients tolerated the treatments well with no adverse events. Two patients reported mild muscle fatigue one day after the treatment. Analysis of the same MRI slices verified by tissue artefacts showed a statistically significant average 18.1±9.1% reduction of adipocyte tissue and 14.4±7.9% increase in muscle mass ($p<0.001$), coupled with measurable circumferential reduction. Fat changes were visible in all patients; one patient didn't have any muscle growth reaction. The weight of the subjects didn't change significantly.

Conclusion: MRI considered as a highly precise diagnostic method revealed significant simultaneous muscle growth and fat reduction 2 months post treatments, unrelated with dieting. This suggests the therapy as a unique solution for patients whose aesthetic problem isn't driven by fat mass only, but also by the underlying muscle structure. This positions the treatment next to existing technologies, and opens physicians' access to a completely new segment of patients who aren't ideal candidates for stamping or suction based fat removal treatments.