

MR-GUIDED HIGH-FOCUSED ULTRASOUND TREATMENT OF UTERINE FIBROIDS- REDUCTION IN FIBROID SIZE AND CLINICAL IMPROVEMENT

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Synopsis: Transcutaneous MR-guided High Focus Ultrasound (HIFUS) ablation of uterine fibroids was performed in 38 symptomatic women scheduled for hysterectomy. Accurate targeting of the ultrasound beam and assessment of heat generation were achieved by real-time MRI monitoring. The aim of the present study was to determine the safety, feasibility and clinical efficacy of this novel non-invasive alternative to hysterectomy. This outpatient procedure was well tolerated by all women, with only 4 women subsequently undergoing their scheduled hysterectomy. The treated fibroids demonstrated a statistically significant reduction in size on follow-up MRI, and the majority of women reported an improvement in their symptoms.

Objective: Thermal ablation of uterine fibroids using HIFUS (High intensity focused ultrasound) under MR-guidance was evaluated for feasibility and clinical efficacy.

Materials and Methods: 38 women with symptomatic uterine fibroids of 5-10 cm were included in this study under Helsinki criteria.

Women underwent diagnostic ultrasound and MR studies previous to treatment. MR-guided HIFUS thermal ablations at energies of 1400-3600J were performed. Follow-up MR studies at 1 month (for the first 25 women) and at 4-6 months were performed. Clinical examinations and evaluations were performed monthly after treatment.

Results: Currently 25 women have already completed the study, and the results in this abstract are from this first group. 28 fibroids were treated in 25 women. Mean fibroid volume was 250ml. Mean ablated volume was 30ml and mean non-perfused volume after ablation was 70ml. At follow-up MRI mean fibroid volume decreased to 88% of pretreatment volume at 1 month ($p<0.001$), and to 83.2% at 4-6 months ($p<0.005$). There was a statistically significant correlation between the ablated volume and the reduction in fibroid volume. 15/25 women reported either significant or some clinical improvement in their fibroid-related symptoms. None of the women experienced any significant adverse side effects after the procedure or during the follow-up period. All women were able to return to their daily routine on the day after the procedure.

Conclusions: Non-invasive thermal ablation of uterine fibroids by MR-guided HIFUS induced a significant regression in mean fibroid size and caused clinical improvement in a majority of women at 4-6m after therapy. The correlation between the ablated volume and the reduction in fibroid volume suggests that larger coagulated volumes will result in even better results.