

One of the goals of medicine has been to develop techniques for performing “surgical procedures” without opening the patient. Non-invasive surgery would eliminate blood loss, scarring, and infections. Recovery times would be shortened and many in-patient procedures could be done on an outpatient basis under local anesthesia. These attributes result in surgical procedures which are less traumatic to the patient and that are significantly more cost effective. Focused ultrasound (FUS) thermal therapy was proposed in the early 1960s and works by concentrating ultrasonic pressure waves to a point at depth in tissue with minimal heating of tissues proximal to the transducer. The marriage of FUS and MR imaging resulted in a technology capable of delivering therapeutic thermal energy to a volume of tissue under imaging guidance. An overview of the General Electric MRgFUS system, procedures for calibrating the system, and preliminary data acquired over the last nine months will be presented. Preliminary *in vivo* animal results show a targeting accuracy on the order of ± 2 mm, good agreement between energy input with lesion size, and excellent correlation with follow-up pathologic evaluation.