

Assessment of Reduction in Subcutaneous Fat Thickness after Liposuction Using Magnetic Resonance Imaging.

Eric Swanson MD

Purpose

Adipose tissue is recognized to have important metabolic functions, including production of triglycerides and inflammatory cytokines. Liposuction is a common technique used to reduce subcutaneous fat. However, this reduction has not been rigorously quantitated. This study evaluates changes in the thickness of the subcutaneous fat layer after liposuction of the lower body and the time course for resolution of swelling.

Methods

Three women underwent MRI scans before surgery and at intervals up to 1 year after surgery. A total of 15 MRI scans were performed. All patients underwent ultrasonic liposuction of the lower body (abdomen, flanks, buttocks, thighs, and medial knees), using a superwet technique. The thickness of the subcutaneous fat layer of the abdomen, flanks, and outer thighs was measured on axial and coronal T1-weighted images.

Results

The mean age was 27.7 years (range, 24 to 33). The mean patient weight was 149 lbs. (range, 121 to 170 lbs.). The mean body mass index was 25.5 kg/m^2 (range, 23.7 to 27.5 kg/m^2). The average infusion volume was 3,150 cc (range, 2,800 cc to 3,400 cc). The average total aspirate volume was 2,917 cc (range, 2,500 cc to 3,250 cc). MRI images of one patient are presented in figures 1 and 2.

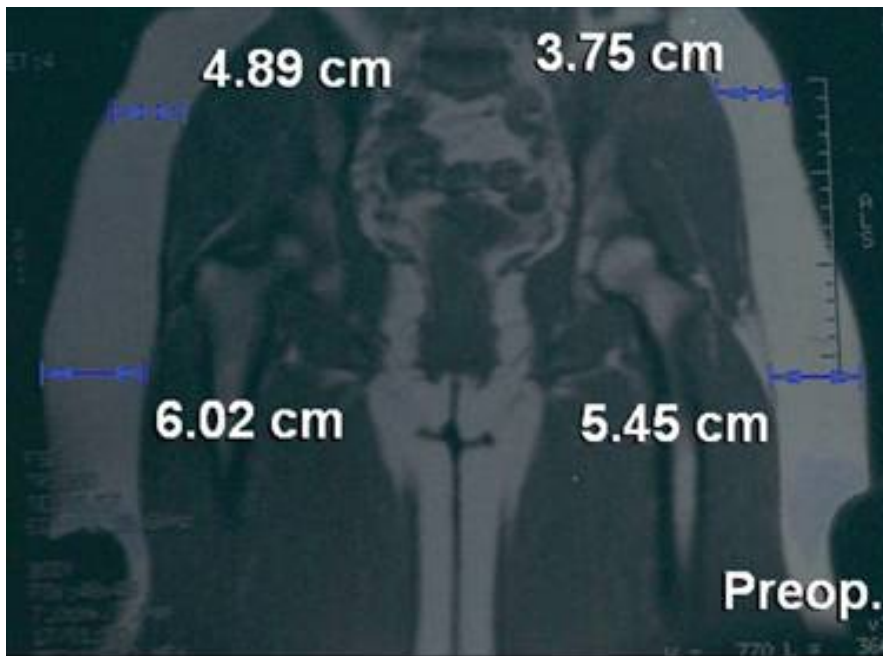


Fig. 1. Preoperative coronal MRI scan of a 33-year-old woman with a BMI of 27.5 kg/m^2

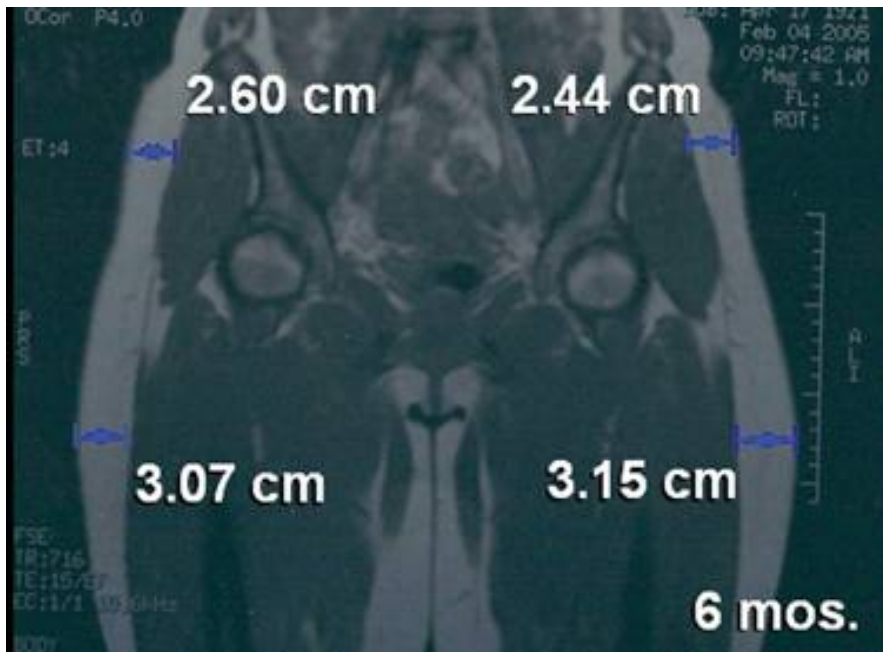


Fig. 2. Coronal MRI scan of the same patient 6 months after ultrasonic liposuction of the lower body, arms and axillae. The total aspirate volume was 3,000 cc. The reduction in subcutaneous fat is indicated at the flanks and outer thighs.

The combined data (combining all 5 anatomic sites) yielded the following reductions in fat thickness: at 1 month, 29.7 percent; 3.3 months, 39.4 percent; and 9.3 months, 45.6 percent ($p = 0.001$). Measurements revealed about one-third swelling 1 month after liposuction and 15 percent swelling at 3 months' follow-up.

Conclusions

Using a new coronal-measurement technique and the proven efficacy of magnetic resonance imaging, this study quantitates changes in fat thickness after liposuction, and provides the time course for resolution of swelling. Liposuction effectively reduces the thickness of the fat layer, by about 45 percent. This information is relevant not only from a cosmetic standpoint, but also as it relates to the metabolic benefits of liposuction.