

Evaluating the Outcomes of Fat Grafting for Lipoatrophy Defects in MS Patients Treated with Subcutaneous Disease-Modifying Therapies (DMT)



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Background

Patients with multiple sclerosis are commonly stabilized on disease modifying therapies (DMT), including glatiramer acetate (Copaxone) or interferon-beta (Betaseron, Rebif, Extavia, Avonex). One of the potential side effects is lipoatrophy at the injection site. This results in the loss of that site for injections and a cosmetically displeasing appearance (Figure 1). We have recruited patients to undergo a fat grafting procedure for lipoatrophy at their injection sites. The procedure is well validated and widely used under local anesthetic to correct contour and soft tissue defects. It involves harvesting fat from an area with ample deposits, a purification process, and injecting the fat for volume augmentation in any subcutaneous plane (Figure 2). Volume outcomes using 3D camera imaging have been used successfully in many areas of plastic surgery. However, there is no report of fat grafting in MS patients who have lipoatrophy secondary to treatment with DMT. This study enrolls MS patients prescribed the procedure as part of their clinical care for lipoatrophy. The study involves imaging the injection site using a 3D scanner before the procedure and at 1, 3, 6, and 12 months after the procedure. The study also collects demographic information. Subjects will complete self-esteem and body image satisfaction questionnaires before the procedure and at 1, 3, 6, and 12 months after the procedure.

Objectives

The primary objective is to evaluate the short and long-term changes in subcutaneous tissue volume following fat grafting for lipoatrophy at DMT injection sites in MS patients. Secondary objectives are to evaluate impact of fat grafting on patient-reported self-esteem and body image satisfaction, to correlate self-esteem and body image satisfaction with subcutaneous tissue volume, and have the grafted sites available for potential re-use as injection sites.

Results

Currently 8 patients have undergone the fat grafting procedure. Grafted areas include the abdomen, buttocks, thigh, and upper arm. Patients currently vary in duration since grafting, with the earliest group five months post surgery, and the latest group one month post surgery. The first two patients showed a gain of 4.8cc and 5.5cc of fat at the one month 3D scan, with this volume retained at the 3 month scan (Figures 4-7). Results and analysis of questionnaires are pending.

Conclusions

This study is in the preliminary stages. The ultimate goal is to improve the contour and appearance in defects secondary to DMT injections, as well as allow these sites to be re used as injection sites in future. Preliminary results show that fat injected is retained at the 3 month measurement visits. Numbers are too small for statistical analysis at this stage. We expect to have further results later this year, and continue to actively recruit patients for this study.

Figure 1. Typical Lipoatrophy Defects

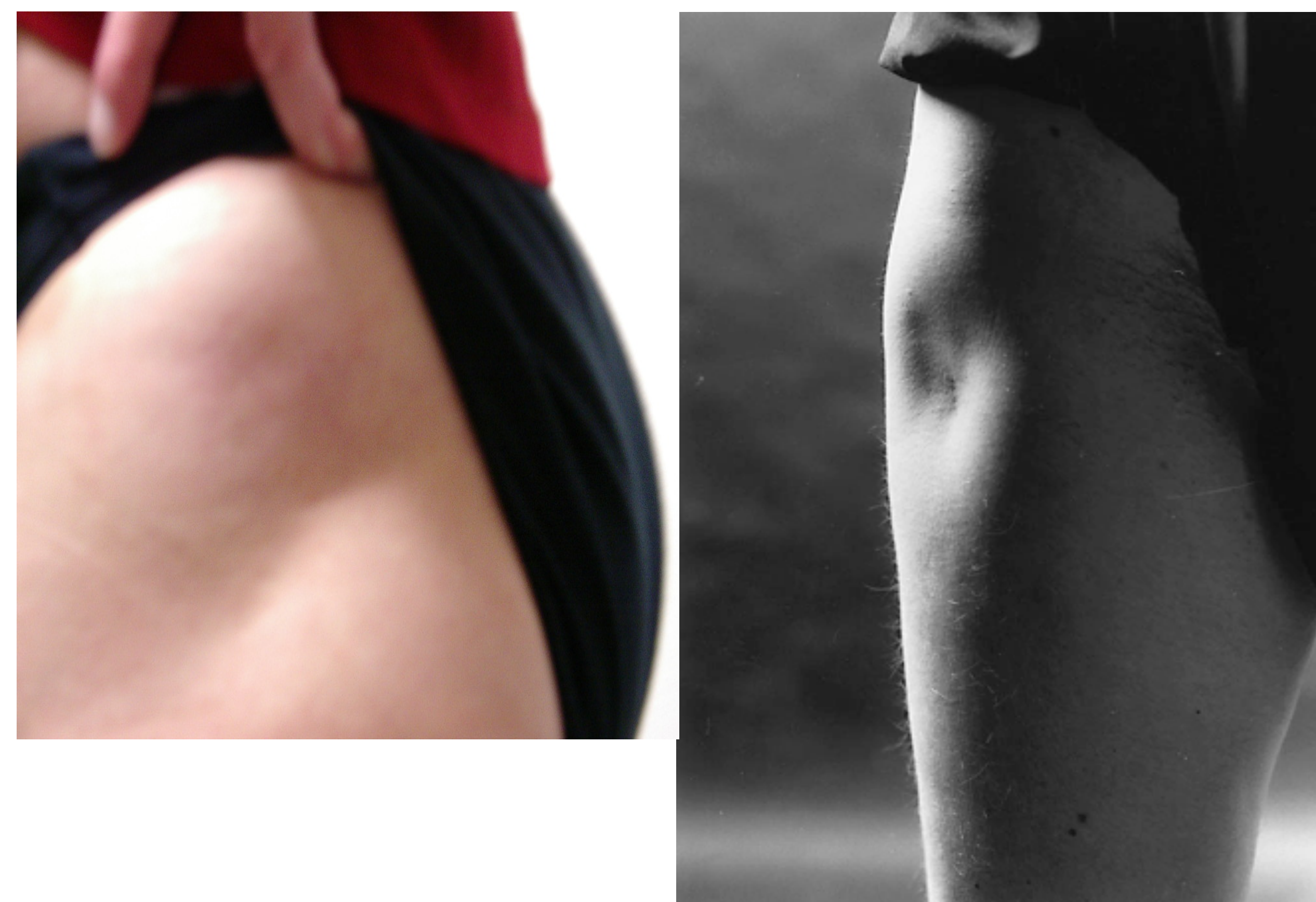


Figure 3. Go!Scan3D



Methods

20 MS patients on DMT will undergo a fat grafting procedure for lipoatrophy at injection sites. Upon enrollment, subjects will complete a paper-based demographic questionnaire. A 3D scanner (Go!ScanTM manufactured by Creaform) is used to measure subcutaneous volumetric data (Figure 3). The scanner captures images and gives three dimensional volume measurements in the area of interest. The amount of fat injected in each patient will be recorded, and analyzed over time to determine the volume that remains at the measured time points. Questionnaires will evaluate self-esteem and body image satisfaction. The study will provide cross-sectional and longitudinal data at multiple time points: before the procedure and at 1, 3, 6, and 12 months post procedure.

Figure 4. Baseline 3D Scan Patient 1

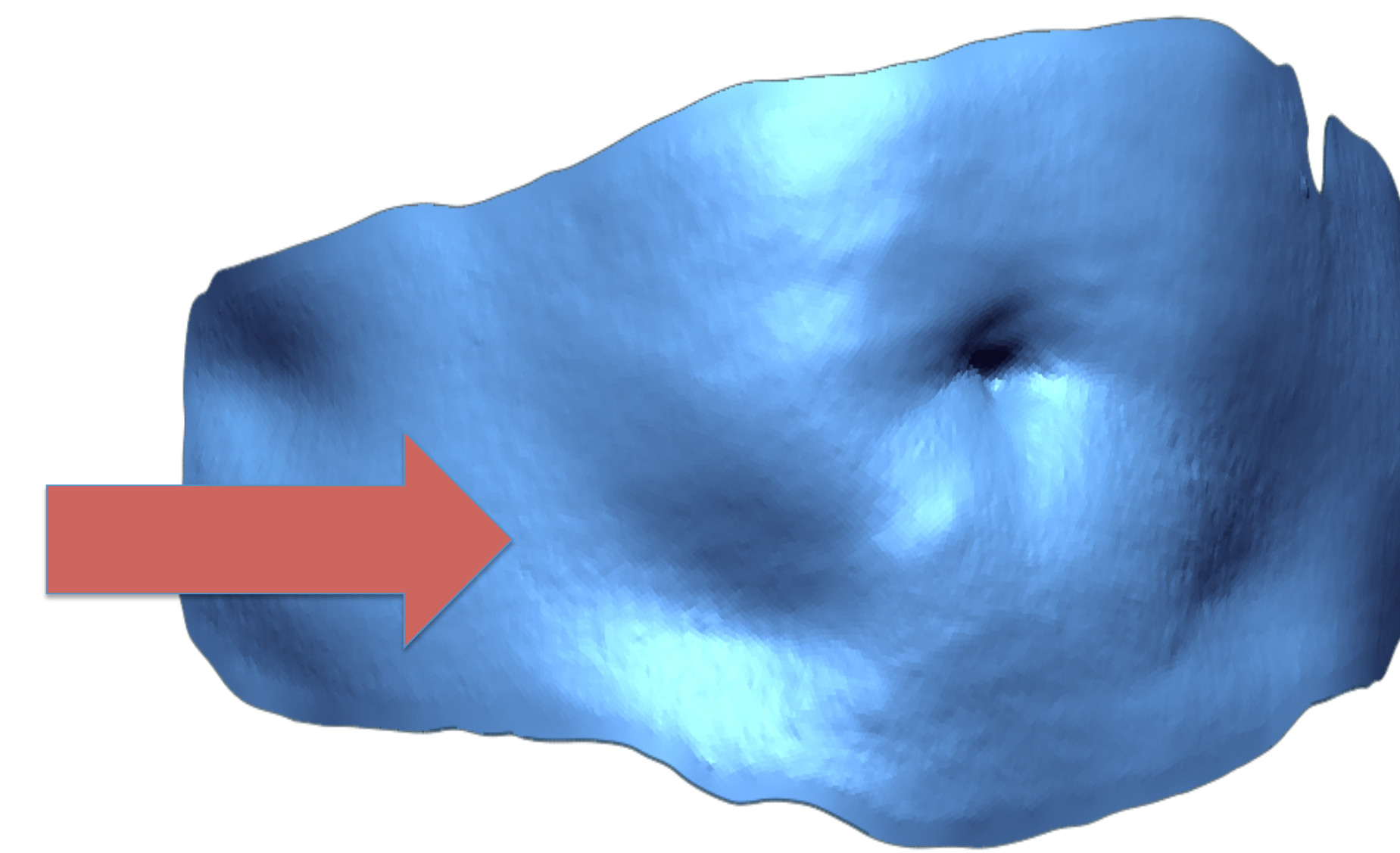


Figure 5. 3 Month 3D Scan Patient 1 : Recipient Area Right Abdomen

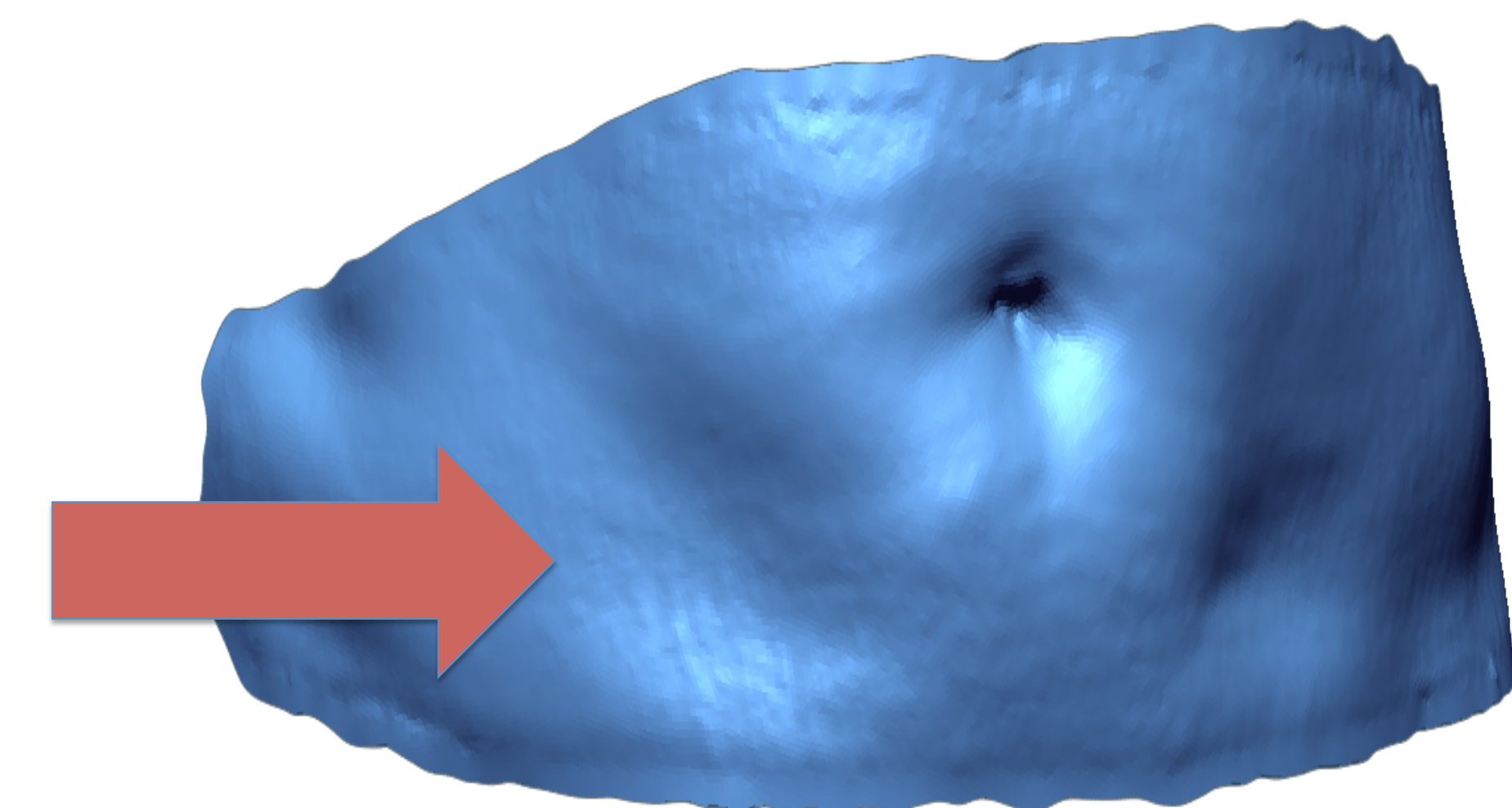


Figure 6. Baseline 3D Scan Patient 2

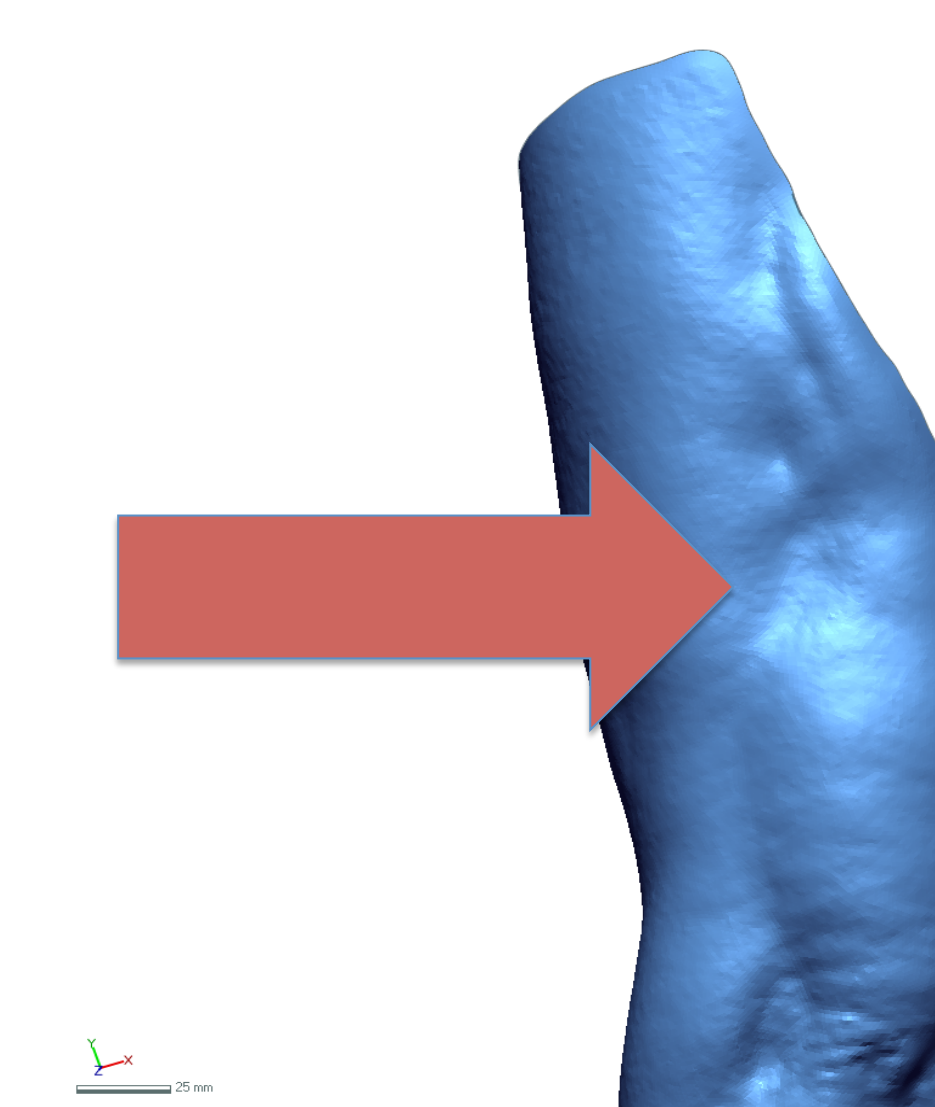
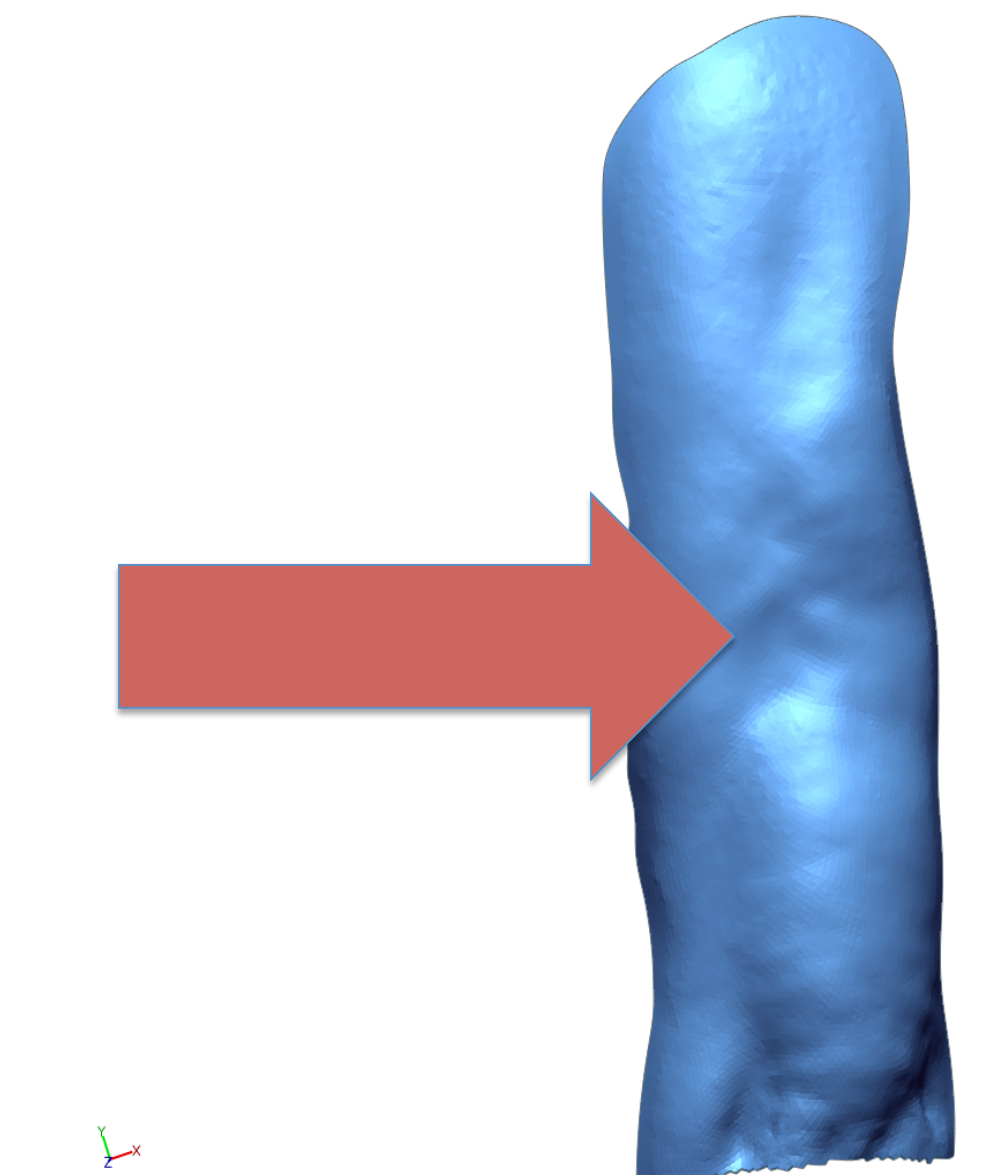


Figure 7. 3 Month 3D Scan Patient 2: Recipient Area Right Thigh



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Disclosures

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Discussion

Fat grafting is a common procedure in plastic surgery. It is used to improve soft tissue and contour defects with many applications, including cosmetic surgery such as facelifts, lip injections, and breast augmentation, but also for lipoatrophy defects, such as in HIV patients. This is the first study to our knowledge evaluating this therapy for contour defects in patients with MS. We are in the early stages of our project, with final results of the first group expected at the end of this year. At this early stage we show that the first two patients have retained the fat that was injected at the 3 month stage.



Figure 2. Typical Fat Grafting Set

