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External Ultrasound-Assisted Lipectomy: Effects on Abdominal Adipose Tissue

Sir:

The use of ultrasound "on the surface" was hypothesized by Scuderi et al. in 1987[1] and resumed by Zocchi in 1996.[2] Ultrasound-assisted liposuction is as a technique that can be associated with suction-assisted lipectomy.[3] This new technique is called external ultrasound-assisted lipectomy. Whereas ultrasound-assisted liposuction emulsifies adipose tissue due to adipocyte membrane lysis, external ultrasound-assisted lipectomy, being less "invasive," induces cell-to-cell contact loss and alters collagenic fibers. This leads to an easier detachment of adipose cells, which remain unaltered and can be mechanically removed. The external ultrasound-assisted lipectomy technique is the transcutaneous application of ultrasound by means of high-frequency ultrasound upon massive infiltrated tissue, followed by traditional liposuction.

Results showed that several different effects were detected on both adipocytes and collagen fibers. In fact, patients treated with a 1-MHz frequency and a potency of 3 W showed no cell destruction, and collagenic fibers were partly conglomerated. In particular, using standard histological methods, it was difficult to distinguish between artifacts, detectable in both treated and control samples, and putative ultrasound destruction. Oil red-O staining, performed on cryosections, is capable of avoiding artifacts and confirmed that in only a small quantity of cases did adipocytes present with rounded membranes, and in limited cases, cells were detached from one another. In fact, immunofluorescence showed that these fibers were either intact or conglomerated, when the ultrasound frequency was 1 MHz (Fig. 1).

In contrast, when the ultrasound frequencies were 2 and 3 MHz with a potency of 3 W, adipocyte alterations were observed. The latter was confirmed using the oil red-O stain, showing complete derangement of fat tissue occurring in biopsies of 3-Mhz-treated patients. In addition, a diffuse collagen fiber retraction, as shown at the immunofluorescence level (Fig. 2), was observed. This was particularly evident when comparing the biopsies of intact controls, which showed normal adipose tissue and intact collagen fibers.

External ultrasound-assisted lipectomy is a good method for the removal of localized fat in patients with moderate obesity.[4] Few studies have been performed up to now with regard to the effects of external ultrasound-assisted lipectomy on adipose cells. A previous study[5] focused on adipose and breast tissue, but it did not take into consideration that adipose cells are subjected to many histological artifacts. In addition, no observations were made of collagen fibers. This is rather important when using external ultrasound-assisted lipectomy, because fat tissue derangement may involve the whole architecture and, primarily, collagen.

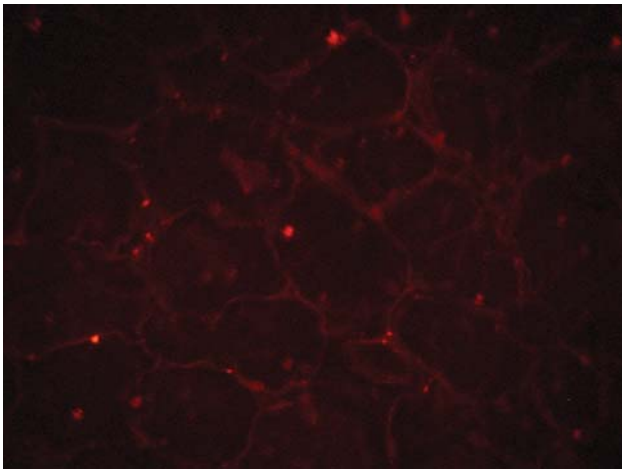

Fig. 1. Abdominal adipose biopsy from a patient treated with 1 MHz. Immunofluorescence phycoerythrin staining for collagen type I fibers showed that they had a normal appearance (original magnification ×200).

In conclusion, we have assessed that when using a frequency of 1 MHz, no alterations or only limited adipocytic alterations are observed, which do not include collagen fibers. Therefore, the technique can be used in aesthetic medicine (localized lipodystrophy, first-degree PEFS), using these frequencies.

Both the 2- and 3-MHz frequencies are able to lead to complete fat tissue disruption, including adipose cells and collagenic fibers and can be indicated for

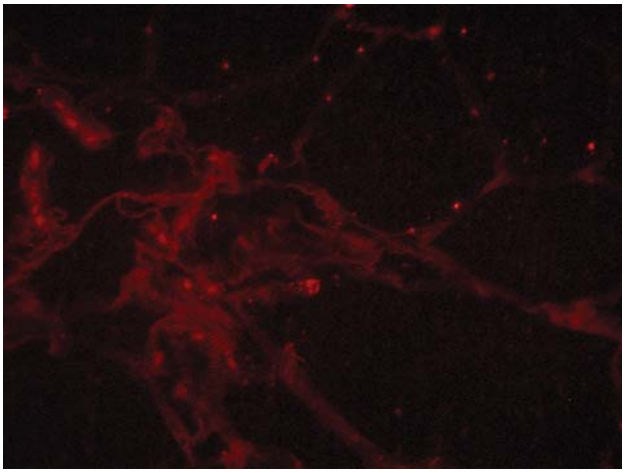

Fig. 2. Abdominal adipose biopsy belonging to a patient treated with a frequency of 3 MHz. Immunofluorescence phycoerythrin staining for collagen type I fibers showed that they were completely retracted (original magnification ×200).

fibrous and inveterate cellulitis (second and third-degree PEFS), in body contouring surgery.
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The Ideal Female Umbilicus?

Sir:

The aesthetic appeal of differing types of the female umbilicus was assessed by Craig et al. in the January 2000 issue ("In Search of the Ideal Female Umbilicus").[1] A total of 147 photographs were categorized by the authors and then scored by a panel of 21 (predominantly male) examiners. A T-shaped umbilicus was the most prevalent and also scored highest on aesthetic appeal. The presence of hooding was shown to increase the score, whereas a protruding, large, or distorted umbilicus scored lower.

But does this reflect the opinion of the general public? And is there a variation in preference with gender? Are we, therefore, as (predominantly male) plastic surgeons reconstructing the most appealing female umbilicus?

We conducted a survey by setting up a Web site depicting color photographs of five female umbilical shapes (Fig. 1). All photographs were matched for size,

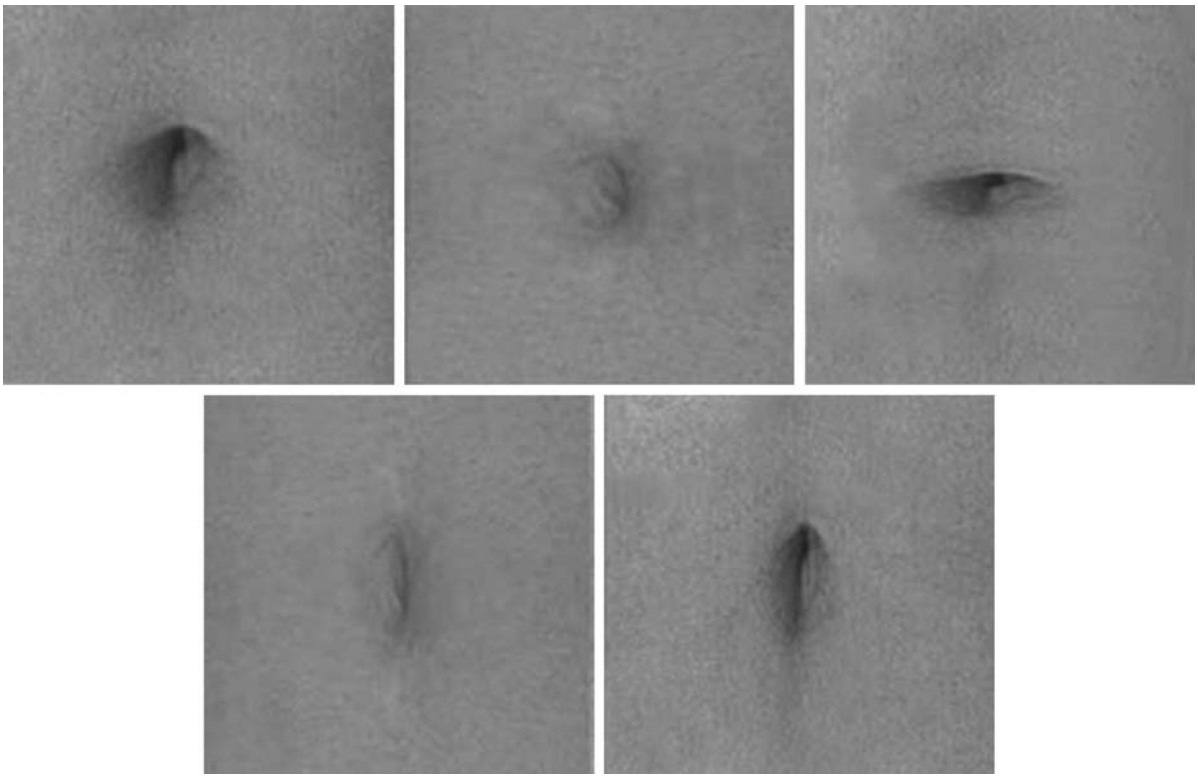

Fig. 1. Color illustrations of the differing umbilical shapes shown here in black and white appeared on the Web site. Participants were required to make a "one-click" choice indicating both their gender and their preference: (*above, left*) hooded oval; (*above, center*) oval; (*above, right*) horizontal; (*below, left*) vertical; and (*below, right*) hooded vertical.