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# Abdominoplasty with Circumferential Liposuction, DVT, Local Anesthesia

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## Abdominoplasty with Circumferential Liposuction: A Review of 1000 Consecutive Cases

***Sir:***

We read with interest the article authored by Sozer et al. describing their vast experience with abdominoplasty with concurrent circumferential liposuction.[1] Their aesthetic results are exceptional and their concept of approaching the entire trunk as an aesthetic unit is indeed how the abdominoplasty patient should be approached.

We had already described the same central unit approach to abdominoplasty with circumferential liposuction, an approach we have been practicing since the 1990s and published in a series of articles regarding liposuction abdominoplasty.[2,3] Our articles described abdominoplasty with concurrent circumferential liposuction, performed under local anesthesia with sedation, an approach we continue to prefer as a means of preventing deep venous thrombosis/pulmonary embolism. In a series now totaling more than 600 consecutive patients since 1996, we have successfully prevented and avoided deep venous thrombosis/pulmonary embolism.

Our approach to abdominoplasty with circumferential liposuction is identical to that of Sozer et al.; however, our operations are more complex and our patient population is at least as challenging. The mean body mass index of our patients was 29.34 kg/m$^2$. The mean amount of supernatant fat removed was 2174.7 ml (maximum, 8200 ml); 59.1 percent underwent concurrent procedures and additional contouring; 16.3 percent underwent buttock fat grafting; and 52 had massive weight loss, necessitating body uplifts, and so on. Our flap undermining extends beyond the costal margin to the inframammary crease, higher and wider than that described by Sozer et al., and 90 percent of our abdominoplasties would be classified as extended abdominoplasties using the classification system of Sozer et al. Our abdominoplasty technique uses a rich network of vessels lining the flap's deep surface to distribute blood supply to the undermined flap, resulting in an increased flap excursion and obviating the need for vertical incisions. Our complications included a seroma rate of 2 percent, an infected seroma rate of 1 percent, and one hematoma.

Fifteen of Sozer's patients sustained deep vein thromboses despite anticoagulant prophylaxis; three of the 15 experienced pulmonary emboli and one of the three died (one per 1000 deaths). Thus, despite following practice recommendations, venous thromboembolism still occurred. This raises questions about the validity of practice recommendations on deep vein thrombosis prevention. Furthermore, anticoagulants in abdominoplasty have risks. Dini et al. sustained a serious bleeding complication rate of 29.6 percent and had to discontinue their study of anticoagulants in abdominoplasties.[4] We sustained one hematoma—the only time we used anticoagulants. In contrast, we have never experienced deep vein thrombosis in the more than 600 abdominoplasties performed since 1996 and in hundreds of additional body contouring procedures performed since 1990.

Although abdominoplasty is a known risk factor for deep vein thrombosis, and which is likely potentiated by general anesthesia, abdominoplasty under local anesthesia with sedation has been largely overlooked. Under general anesthesia, muscle tone is reduced (lessening the effectiveness of the muscle pump mechanism), and positive-pressure ventilation lessens the effectiveness of the respiratory pump, further reducing venous return.[5] Sedation better maintains muscle tone and enables evaluation of abdominal laxity under truer physiologic conditions, preventing abdominal wall overtightening, respiratory dysfunction, and a further increase in intraabdominal pressure.[6] Safety data for the year 2012 from Florida and Alabama implicating abdominoplasties under general anesthesia in surgical deaths and the information in this letter back our call to readers to consider abdominoplasty under local anesthesia.

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## DISCLOSURE

*None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this communication.*

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## Fate of Free Fat Grafts with or without Adipogenic Adjuncts to Enhance Graft Outcomes

***Sir:***

We read with great interest the article by Tang et al. entitled "Fate of Free Fat Grafts with or without Adipogenic Adjuncts to Enhance Graft Outcomes."[1] This article assessed the fate and origin of the tissue at harvest at 6 and 12 weeks by injecting human lipoaspirate into the scalps of immunodeficient mice while using specific markers. Meanwhile, the authors also investigated the potential for added stromal vascular fraction and/or a porcine fat-derived extracellular matrix (Adipogel) to see whether the graft outcome could be enhanced by adding these adipogenic facilitators.

The results were inspiring, and we admire the achievements they have made in researching the fate of free fat grafts and the positive effects of adipogenic adjuncts, which might be another reflection of the regeneration of fat grafts. However, there are a few questions and perspectives that we would like to put forward.

First, the authors introduced the immunostaining method for different components of the tissue, in which the peripheral neoadipogenesis was identified as murine (host) origin because it stained for perilipin but not for human vimentin. However, we could not help thinking that the negative marker for neoadipogenesis has relatively lower specificity in comparison with the positive marker. In addition, the murine adipose-derived stem or stromal cells were not identified. The newly formed adipocytes might come from grafts but not stain for vimentin. In fact, Qiu et al. have constructed a similar animal model, where human adipose grafts were harvested and injected into the backs of the mice. The newly formed smaller adipocytes surrounding the fibrous membrane were also found. By using a monoclonal antibody against a human mitochondrial protein that does not react with mouse, the result of immunofluorescence showed that the newly formed fat was derived from the human graft.[2]

Second, the authors harvested the implanted tissue at 6 and 12 weeks after the implantation surgery. Nevertheless, according to the study by Suga et al.,[3] adipocytes tend to undergo apoptosis 24 hours after transplantation, whereas adipose-derived stem cells initiate adipogenesis or angiogenesis in 3 days. Generally, the whole degeneration, regeneration, and stabilization process would last for 3 months to 1 year or more. Therefore, the timing of harvest and observation during research might not be accurate enough for us to see the dynamic changes of the adipose-derived stem cells and adipocytes during the postimplantation process.

Third, in the experiment, the lipoaspirate was sourced from a healthy 45-year-old woman whose body mass index was 29 kg/m$^2$, which could be medically defined as overweight or obesity. It was widely perceived that an obese or fat person had a higher risk of possessing adipose tissue, with a lower chance of survival.[4] This argument was evidenced by the mild inflammatory and ischemic environment found in adipose tissue in obese people, which posed negative effects on vitality of adipocytes and adipose-derived stem cells.[4,5] For this reason, we expect to witness identical results from the grafts harvested from more patients with diverse body mass indexes.

Fourth, we are grateful that the authors conducted this experiment, which profoundly uncovered the possible mechanism and the fate of fat grafts and laid a great foundation for further investigation and research in this field. The existence of live adipocytes outside the fibrous membrane with mostly dead clusters inside could be an indication that formed fibrous membrane have encompassed most of the grafted tissue but not all of it.[6] Further understanding of the mechanism behind the formation of fibrous membrane might shed new light on the survival and regeneration of adipose graft. We are looking forward to the unveiling of the characteristics of peripheral adipocytes and factors that could drive the observed distribution and contouring of the grafted components.

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