

Conceptual Paper: Abdominoplasty and Liposuction in Systemic Sclerosis

Naim Mahroum MD^{1,6}, Magdi Zoubi MD¹, Abdulla Watad MD^{1,6}, Howard Amital MD MHA^{1,6}, Josef Haik MD MPH^{2,6,7}, and Yehuda Shoenfeld MD FRCP MaACR^{3,4,5,6}

Departments of ¹Medicine B and ²Plastic and Reconstructive Surgery, and ³Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center, Tel Hashomer, Israel

⁴Ariel University, Ariel, Israel

⁵Laboratory of the Mosaics of Autoimmunity, I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University), Moscow, Russia

⁶Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

⁷Institute for Health Research, University of Notre Dame Australia, Fremantle, Western Australia, Australia

ABSTRACT Surgical interventions in patients with systemic sclerosis (SSc), in particular plastic procedures, might cause undesired consequences. Notably, liposuction seems to possess greater risk as adipose tissue has been shown to play an important role in treating wounds and ulcers in patients with SSc. While anticentromere antibodies were found to be correlated with vasculopathy in SSc, patients with SSc and anticentromere antibodies might be more vulnerable to surgical wound complications following liposuction. A 46-year-old female patient, who had been diagnosed with SSc at the age of 31 years, had antinuclear as well as anticentromere antibodies. She underwent abdominoplasty with liposuction and developed severe skin necrosis of the abdomen following the procedure and at the site of liposuction. The correlation with anticentromere and the role of liposuction in skin necrosis in SSc are presented.

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KEY WORDS: abdominoplasty, anticentromere antibodies, autoimmunity, liposuction, systemic sclerosis (SSc)

Immune activation and vascular damage are key factors in the pathogenesis of systemic sclerosis (SSc) [1]. These factors interfere with the process of tissue repair and wound healing, which raises concerns about the consequences of surgical procedures in patients with SSc [2]. Patients with SSc manifest different types of autoantibodies; each was shown to correlate with specific clinical presentations [3]. For example, anticentromere antibodies were found to be correlated with vasculopathy, which contributes to the appearance of digital ulcers in SSc patients [4]. In other words, patients with SSc with anticentromere antibodies might be at greater risk for complications of surgical wounds as the vasculature needed for wound healing is damaged [5]. The situation is further complicated due to the fact that adipose tissue was shown to accelerate the healing process of digital ulcers in patients with SSc [6]. Therefore, plastic surgery procedures, particularly those including liposuction in patients with SSc with anticentromere

antibody, might have hazardous effects. We present a case of severely affected surgical wound following abdominoplasty and liposuction in a patient with SSc.

PATIENT DESCRIPTION

A 46-year-old woman worked as a cosmetician. She was diagnosed with SSc at the age of 31 years and had two pregnancies and deliveries after which she showed abdominal obesity. She presented herself to a plastic surgeon complaining of abdominal obesity and was advised to have a belly stretching surgery, including liposuction of about 1000 ml. The surgeon was informed by our patient about her known diagnosis of SSc.

The history of SSc in our patient began about 15 years prior to the liposuction. In the same year she delivered a baby at the 36th week of pregnancy by caesarean section. Her pregnancy was complicated with preeclampsia. At the start of the disease the patient was admitted to the vascular surgery department due to digital ulcers on the left hand. Afterward, Raynaud's phenomenon appeared. She was treated with Iloprost, a synthetic analogue of prostacyclin, which led to no improvement. Blood tests found antinuclear antibody (ANA) was positive in a titer of 1:160 and anticentromere antibodies (ACA) measuring 93 IU/ml. Anti-Scl 70, anti-DNA, and anti-polymerase were not detected. Furthermore, the patient complained about dysphagia to solids during this year. Gastroscopy demonstrated esophageal lesions suitable with gastroesophageal reflux disease (GERD), together with positive manometry and defective motility of the esophagus. The patient started to complain of dyspnea.

In the 3 years before the abdominoplasty with liposuction, digital ulcers extended and involved both hands. Dyspnea appeared at rest and sclerodactyly of the heel hindered her from working. The symptoms of SSc continued after the abdominoplasty with liposuction. On a plain X-ray of the hands acro-osteolysis due to digital ulcers were diagnosed, as well as

calcification of soft tissue of the finger. Furthermore, suspected calcinosis over the right elbow and telangiectasia were observed. In blood tests ACA was still positive.

A month after the consultation with the plastic surgeon, the patient underwent abdominoplasty and liposuction (1050 ml) of the abdomen. The course of the surgery and post anesthesia recovery were with no unusual incidents. The following day she was discharged home with an abdominal support belt and analgesics as needed. On the 15th postoperative day, a dry skin necrosis of 6 × 4 cm was seen during a visit to the postoperative clinic [Figure 1]. No secretion or suspected infection was described at that time. However, a debridement of the necrotic skin was performed until a vital tissue was reached. Thereafter a bandage soaked in physiologic solution was applied. Eight days later (23rd postoperative day) granulation tissue was documented. On the 30th postoperative day, due to lack of improvement and continuation of the skin necrosis [Figure 3], a vacuum assisted closure (VAC) therapy machine was instituted. The VAC device was applied for 5 months and was removed eventually considering an improvement of the crater. Almost 2 years following the liposuction, multiple scars with centrally depressed skin were noticeable [Figure 4].

COMMENTS

As patients with SSc require special perioperative considerations due to the systemic and vital organ involvement [7], the consequences of plastic surgery procedures for aesthetic reasons might be unfavorable in these patients. While adipose tissue plays an extremely important role in tissue and wound healing [8], liposuction may be an additional risk in those patients [9].

Vasculopathy, notably of small-sized vessels, is a key factor in the pathogenesis of SSc. Endothelial cell injury and remodeling of affected vessels constitute the basis of vascular disorder [4]. Small-sized vasculopathy can be demonstrated in the digits by capillaroscopy [10] and was postulated to be involved in avascular necrosis seen in patients with SSc [11].

As the disease progresses, vasculopathy leads to circulation defects, the emergence of Raynaud’s phenomenon, and the development of digital ulcers [12]. In turn, autoantibodies detected in patient with SSc have been shown to have a significant correlation with those pathogenetic mechanisms as well as the clinical features seen in patients with SSc [3]. For example, anticentromere antibody was found to be more prevalent in female patients and was associated with vasculopathy and digital ulcers [13]. As digital ulcers cause tremendous pain and require frequent treatments, they have great impact both on the patients and the treating physicians [14].

Adipose tissue derived stem cells, also called mesenchymal cells, have been recruited to assist in the healing of non-clos-

Figure 1. Dry skin necrosis, 15th postoperative day



Figure 2. Extension of skin necrosis, 23rd postoperative day



Figure 3. Abdominal wall opening, 30th postoperative day



Figure 4. Multiple scars, 2 years after the abdominoplasty with liposuction



ing wounds in animal models [15,16]. Clinical studies in humans have also been conducted. Scuderi and colleagues [17] showed a significant improvement in skin tightening after autologously transplanting cultured adipose tissue-derived stromal cells aimed to treat cutaneous manifestations in patients affected by SSc. The cells were isolated from the subcutaneous adipose tissue of those patients. In addition, a double-blind randomized experiment [18] evaluated the effect of adipose tissue-derived stem cells when injected into digital ulcers of patients with SSc. Stem cell recipients were compared with patients who were given a saline solution. The procedure was performed in 25 and 13 patients, respectively. Healing was observed in 23 of 25 patients in the stem cells group compared to 1 of 13 in the saline injection group. The latter group received salvage therapy afterward. The authors concluded that adipose tissue in the skin of scleroderma patients is important in healing wounds and cuts of the skin. Unsurprisingly, in our patient the abdominoplasty with liposuction led to an aggravation and non-healing of the surgical wound and inspired the necrosis of the skin [Figure 2]. In fact, autologous fat grafting was found effective and safe in the treatment of skin manifestations and digital ulcers in patients with SSc improving both objective and subjective findings. Moreover, the direct correlation between liposuction and the formation of skin necrosis was illustrated by Galeazzi and co-authors [9]. The authors presented a young female patient who developed typical lesion of skin sclerosis following abdominoplasty with liposuction and limited to the area of liposuction. Prior to the appearance of this lesion, the patient presented with Raynaud's phenomenon, similar to our case, and also had anticentromere antibodies. The rest of the serology was negative. The authors pointed to a trauma (liposuction) as a trigger mechanism in the appearance of skin lesions in which a pre-sclerosis condition became significant sclerosis after liposuction.

CONCLUSIONS

Non-life-saving surgical procedures, especially esthetical ones based on reduction of adipose tissue, should be avoided in patients with SSc in general and in those with anticentromere antibodies in particular. Such patients are more susceptible to tissue repair failure and surgical wound healing defects. Plastic surgeons and doctors dealing with aesthetics should consider this vulnerability and consult with rheumatologists before considering such procedures.

Correspondence

Dr. Y. Shoenfeld

Zabludowicz Center for Autoimmune Diseases, Sheba Medical Center, Tel Hashomer 5265601, Israel

Phone: (972-3) 530-8070

email: yehuda.shoenfeld@sheba.health.gov.il

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It is not titles that make men illustrious, but men who make titles illustrious.

Niccolo Machiavelli (1469-1527), political philosopher and author

**If life's lessons could be reduced to single sentences,
there would be no need for fiction.**

Scott Turow (born 1949), author and lawyer