

# High-Definition Liposuction in Men



Michael J. Stein, MD, FRCSC<sup>a,b,\*</sup>, Alan Matarasso, MD, FACS<sup>a,b</sup>

## KEYWORDS

- Male plastic surgery • Male aesthetics • Male liposuction • Male body contouring
- High-definition liposuction

## KEY POINTS

- Liposuction has evolved from a procedure whose objective was primarily fat extraction to one which equally sculpts and redistributes fat in order to enhance natural muscular contours and shadows.
- Appropriate patient selection is necessary to perform HDL safely, effectively and reliably.
- Although numerous techniques can be used, the optimal technique is one tailored to the male's specific anatomy.

## INTRODUCTION

Decades of innovation and technical refinement has made liposuction a safe, reliable, and reproducible procedure that is associated with high patient satisfaction.<sup>1</sup> Liposuction is the most common aesthetic procedure performed worldwide, and its popularity is increasing, with a 24% increase from 2014 to 2018.<sup>2,3</sup> In 2018, expenditures exceeded 1.3 billion dollars in the United States alone. Increasing obesity rates, improved visibility through social media, and an increasing number of patients seeking body contouring with minimal downtime has fueled its rapid increase in popularity and broadening indications for use.

Traditional liposuction, which is typically performed in the deep subcutaneous plane, was popularized as an effective way to extract fat and treat moderate to severe lipodystrophy of one or more body areas. Superficial liposuction, or debulking of the fat layer above the fascia superficialis (Scarpas, Colles, or Campers fascia based on its anatomical area), was historically approached with caution, as it was associated with an increase in complications such as

induration, fibrosis, seroma, and contour irregularities.<sup>4</sup> A variety of technological adjuncts emerged over the years, such as ultrasound, laser, power, and radiofrequency-assisted liposuction devices, yet all predominantly targeted fat in the deep subcutaneous plane, and served to facilitate more efficient fat extraction and soft tissue contraction.

Recently, superficial liposuction has re-emerged as a finesse body contouring technique that enhances muscular definition. The idea that differential liposuction could be performed in the superficial plane around muscle groups to enhance aesthetic outcomes was initially described in the 1990s by Mentz,<sup>5</sup> Fodor,<sup>6</sup> and Ersek.<sup>7</sup> This technique, which the investigators referred to as “abdominal etching,” exhibited superior aesthetics in contouring the male abdomen compared to traditional liposuction maneuvers. Specifically, the investigators demonstrated that stubborn subdermal fat was responsible for obscuring the final muscular contour following traditional techniques, and removing differential thicknesses of fat around these muscles illuminated them and enhanced their postoperative

Received: Jan 1, 2022.

<sup>a</sup> Manhattan Eye, Ear and Throat Hospital, 210 E 64th St, New York, NY 10065, USA; <sup>b</sup> Lenox Hill Hospital, 100 E 77th St, New York, NY 10075, USA

\* Corresponding author.

*E-mail address:* mike.stein@nychhc.org

Clin Plastic Surg 49 (2022) 307–312

<https://doi.org/10.1016/j.cps.2022.01.003>

0094-1298/22/© 2022 Elsevier Inc. All rights reserved.

appearance. Although the described techniques were limited to contouring of the male abdomen, the concept that liposuction could now “sculpt” fat, instead of simply removing it, was born, and the demographic of patients presenting for liposuction slowly broadened.

Restricting patient selection to abdominal contouring in men with relatively low body mass indices, a steep technical learning curve, and persistent fear of complications tempered widespread adoption of these early techniques. In the late 2000s, however, Hoyos<sup>8,9</sup> described, and subsequently popularized, a modified, more comprehensive technique, that expanded on original principles to include 3-dimensional contouring of the entire body. “High-definition liposuction” (HDL), now applied to both sexes, at varying degrees of body fat percentages, and used vibration amplification of sound energy resonance (VASER) technology to facilitate enhanced sculpting. VASER-assisted HDL emphasized selective fat retention and removal in both superficial and deep layers to generate more natural and highly defined muscular units. The goal was fat sculpting rather than fat debulking. Fat was first prepared by emulsification, followed by the selective sculpting by gentle extraction aspiration around natural body convexities and concavities. Hoyos emphasized the importance of addressing “dynamic zones” of the body, where surgeons would anticipate the precise muscle movements during physical activity and sculpt the fat in a complementary fashion to avoid artificial-looking results. Increasing evidence over the coming years supporting HDL’s safety, reliability, and aesthetic outcomes lead to its gradual adoption among the plastic surgery community.

Today, HDL has become common in the public vernacular. Improved visibility via social media has made the procedure increasingly popular, particularly among male patients. Patient perception has colloquially morphed liposuction into 2 separate procedures; the “traditional” or “basic” liposuction for fat extraction and the “new” or “advanced” high-definition technique. In the authors’ practice, we find patients calling to specifically ask if the surgeon performs the “new type” of liposuction. Patients seem to be motivated to seek a surgeon who is equipped with the tools and experience to perform these techniques.

As enthusiasm for this procedure continues to grow, surgeons must equip themselves with the knowledge and techniques to appropriately select patients for the procedure, counsel them accordingly, and execute the procedure safely and effectively. Herein, we present important aspects of

HDL anatomy, patient selection, surgical technique, and outcomes.

## SUBCUTANEOUS FAT ANATOMY

Surgeons performing HDL must appreciate the regional differences in subcutaneous anatomy throughout the human body. The relative thickness of superficial and deep subcutaneous layers and the density of the fibroseptal network within these layers differ topographically across the body. As such, liposuction technique must be modified accordingly.

The superficial subcutaneous layer is characterized by dense fat lobules within an organized and compact strattice of fibroseptal fibers. The deeper layer, which is considerably thicker in areas of fat accumulation such as the abdomen and inner thighs, is characterized by larger and looser fat lobules, and a more haphazard fibroseptal network arrangement.<sup>10</sup>

Key zones of adherence throughout the body must also be recognized to prevent contour irregularities.<sup>11</sup> These include the lateral gluteal depression, gluteal crease, posterior thigh, inferolateral thigh overlying the iliotibial band, and the mid-medial thigh. These zones are characterized by a thin deep subcutaneous layer and dense fibroseptal network attachment tethering the superficial fascia to the deep muscular fascia. The paucity of deep subcutaneous fat in these areas lead to easy cannula misadventure into the superficial plane, increasing the risk for contour irregularities.

The fibroseptal network is also responsible for cellulite, a common presenting complaint of patients presenting for liposuction. While the pathophysiology of cellulite formation is not fully understood, the structural orientation of the collagen septae, as well as hormonal and inflammatory etiologies have been proposed. While cellulite occurs in 80 to 98% of postpubertal women, it is uncommon in males, but can occur when males with androgen deficiency or who take estrogen therapy.<sup>12</sup> Two types of cellulite have been described. Type I cellulite, which is considered genetically predetermined, results from fat hypertrophy around fibroseptal network dermal tether points (classically seen in the legs and buttocks). They are more commonly found in women, occur at a younger age, and are unrelated to the degree of adiposity or overall body shape. Type II cellulite, on the other hand, results from skin laxity and is more common in elderly patients with poor skin quality.<sup>13</sup>

Key intergender and interracial differences in fat distribution also exist. Men classically present with

an android pattern of fat distribution, with an evenly distributed accumulation of fat centrally and a linear shape to the body. They tend to accumulate fat in the abdomen and superolateral hips. Women classically present with a gynoid fat distribution, which is most prominent in the gluteofemoral region posteriorly and inferiorly, resulting in a curvilinear body shape. These distributions must be preserved (and at times enhanced) during liposuction to attain aesthetic results and prevent inappropriate feminization or masculinization of the body. Interracial differences similarly exist. The distribution of body fat for women of the same BMI differs by race in reproductive-aged women, with some ethnic backgrounds accumulating more fat in the buttocks and hips than others.<sup>14,15</sup> It is important to respect these cultural preferences and cosmetic ideals when performing high-definition liposuction in men.

## PATIENT SELECTION

Not all male patients are liposuction candidates, and HDL candidacy is even more selective. Appropriate patient selection and risk stratification is critical to performing the procedure safely and reliably. A thorough past medical and surgical history, and review of medications, supplements, allergies, and social and family histories are all critical in screening for risk factors. In our practice we consider nonobese patients with good skin quality and mild to moderate fat excess. They should have a BMI less than 30, maintain a healthy lifestyle, exercise regularly, have a stable weight for 12 months, and exemplify appropriate expectations. Ideally patients have no medical or psychiatric comorbidities, and if they have a history of smoking, they are asked to refrain for 4 weeks preoperatively. Any comorbidities warrant preoperative assessment and clearance from a primary care provider.

Poor candidates for HDL have unrealistic expectations, may exhibit features of body dysmorphia during the consultation, and have a history of massive weight loss or poor skin quality. Patients with skin excess will be disappointed with HDL alone. While select patients with mild skin excess and laxity can be treated effectively with radiofrequency-assisted devices during HDL, most cases require concomitant or delayed excisional procedures to attain the optimal aesthetic. Patients should be counseled accordingly.

We provide a list of medications and supplements to prospective patients that are associated with an increased risk for bleeding or clotting, or which may interfere with lidocaine metabolism. We require all patients to seize supplementation

and/or hormonal therapy for at least 4 weeks before surgery. If the patient takes nonsteroidal antiinflammatories, they are held for 2 weeks before surgery. We calculate a Caprini score for each patient to assess their risk of venous thromboembolic event (VTE) and anticoagulate patients and/or refer them to a hematologist as necessary.

## SURGICAL TECHNIQUE

A “one-size-fits-all” approach to HDL must be avoided. Optimizing results requires the surgeon to tailor their technique to the specific body type and anatomy. Body biotype, metabolic state, patient age, race, sociocultural factors, and preoperative expectations all must be considered to prevent unnatural results.<sup>16</sup> Small volume HDL cases can be performed under local or general anesthesia based on patient health status and comfort level. HDL in the context of high-volume liposuction, concomitant procedures, or 2 or more areas are performed under general anesthesia. Cases are done in an ambulatory fashion with lipoaspirate volumes kept less than five liters.

### *Patient Preparation*

Patients are dressed in a surgical gown and compression stockings, and standardized preoperative photographs are taken. The patient is then marked in the standing position, with black to indicate anatomic landmarks such as bony prominences, green to indicate areas of volume reduction where liposuction is primarily done in the deep plane, and red to demarcate inscriptions (ie, *linea semilunaris*, *linea alba* and transverse inscriptions) and zones of transition (also known as negative spaces or shadow areas), where liposuction is done more superficially. Blue cross-hatches are placed in areas that will be augmented with fat grafting. In males, it is particularly important to ask them to contract muscle groups in different body positions to help illuminate “dynamic zones”<sup>17</sup>. Zones of transition are therefore not marked as distinct lines but a rectangle reflecting muscle position in resting versus contracted states. Without marking dynamic muscle contraction, liposculpting in males looks artificial and unnatural. After marking the patient, standardized photographs with markings are repeated in the same views.

Patients are prewarmed with a Bair Hugger and premedicated with antiemetic and nonsteroidal antiinflammatories. A lower body Bair Hugger is placed on the operating room bed, under a sterile blue drape. Sequential compression devices are placed upon entering the room. A surgical pause

is performed, at the end of which we review and post on the operating room monitor the patient's weight, maximal allowed volume of tumescent solution using a maximum limit of 35 mg/kg, and the planned volume of infiltration (total and per area). A cephalosporin antibiotic is administered at the start of the case and redosed as necessary.

### ***Surgical Technique***

---

The least number of incisions to facilitate maximal access to the treated area is chosen. Having said this, men commonly require more incisions than women to gain access to inscriptions, and surgeons should not compromise the surgical result by limiting access points. Where possible, incisions are strategically placed in skin creases or along undergarment lines. If incisions cannot be hidden, such as in the central back in men, we purposefully place incisions asymmetrically. Tumescent infiltration is performed with a roller pump through an exploded tip cannula MicroAire hand-piece (Surgical Instruments, Charlottesville, VA), using the simultaneous separation and tumescent technique (SST). A solution of 1000 mL Ringers Lactate, 1mL of 1:1000 epinephrine, 50 mL of 1% lidocaine (500mg) and 10 mL of 8.4% sodium bicarbonate is used. Although it has been shown that the optimal waiting time until maximal hemostatic effect is 26 minutes,<sup>18</sup> we typically wait 10 minutes before proceeding with aspiration. Fat emulsification using the VASER probe has been championed by investigators such as Hoyos and allows for smooth and effective fat extraction. In our practice, aesthetic results can be achieved with power-assisted liposuction (PAL) alone, which we find decreases operative time, surgical costs, and risk of skin burns. VASER is preferentially used for secondary liposuction cases in which there is more tissue fibrosis. Aspiration is performed in the deep plane with a Mercedes cannula, the size of which depends on the body area (4–5 mm for trunk, 3–4 mm for extremities). Next, controlled deformities are created over inscriptions in the superficial plane with an exploded tip cannula. This is tapered laterally in order to accentuate zones of transition. Unlike in women, who are best treated with gradual tapering, the male aesthetic requires sharper and more obvious transition zone around muscle groups. The nondominant hand guides the cannula trajectory, and pinch tests are used to assess thickness and symmetry between sides.

In cases where fat grafting augmentation is added to the procedure, we prepare the fat by decantation and transfer them into syringes for manual injection. All fat grafting is performed in

the subcutaneous and not the intramuscular plane, irrespective of anatomic area. The pectoralis and deltoid muscles, so-called male "alpha" muscles, require volume to further exentuate the transition zone created with HDL. The rectus muscles on the other hand, seldom requires fat grafting as HDL alone will accentuate contour sufficiently. If performed, modest volumes are injected, as the recti quickly adopt an artificial static appearance, discordant with their dynamic contraction. Following fat grafting, all incisions are closed with a deep dermal monocryl sutures followed by nylon simple interrupted sutures. Drains are only used in high-volume liposuction cases.

### ***Postoperative Care***

---

Foam cut outs are placed over inscriptions and areas of superficial liposculpting, and a compression garment is placed over top. This garment is worn continuously for 48 hours and then taken off for the first shower. The patient is encouraged to shower daily and begin lymphatic massages at this point. For 2 weeks the patient is encouraged to use the foam cut outs and surgical compression garment. After 2 weeks they can remove the foam and wear the compression garment of their choosing. It is worth noting that the patient must try on their own compression garment at a follow-up visit so it can be assessed by their surgeon. Inappropriately fitted garments can lead to hyperpigmentation, skin irritation, and even full-thickness skin necrosis.

Select patients who undergo concomitant procedures or high-volume liposuction are monitored overnight. Otherwise, patients are discharged with a chaperone and encouraged to ambulate immediately and regularly. All patients are discharged with an information packet about their postoperative course, a list of red flags to look out for, and contact information should they have any concerns postoperatively.

### ***High-Definition Liposuction as Concomitant Procedure***

---

HDL is increasingly being used concomitantly with excisional procedures, such as abdominoplasty,<sup>19,20</sup> gynecomastia surgery,<sup>17,21</sup> brachioplasty,<sup>22</sup> and fat grafting.<sup>23–25</sup> Although it can be performed before or after skin excision, our practice is to perform it first, as it helps facilitate maximal skin resection. If HDL is performed first, the surgeon must mimic the vector of skin redraping following excision and mark inscriptions and transition zones accordingly. For instance, during the male abdominoplasty, the skin flap is cheated medially upon closure to avoid "dog ear" formation. If rectus

diastasis is performed, the rectus abdominis muscles will also be medialized. If HDL is performed without consideration of these post-resection changes, sculpted inscriptions and transition zones will be inappropriately positioned. Preoperative markings must mimic anticipated vectors of skin advancement and the HDL performed accordingly. In the author's practice we have adopted HDL as a routine adjunct to male abdominoplasties, brachioplasties and gynecomatstia surgeries.

## OUTCOMES

The most common complications following HDL are seroma and contour irregularities. Bruising, and rarely, hematoma are possible. Rare major complication of liposuction in general includes VTE, fat embolism, skin necrosis, lidocaine toxicity, and visceral perforation.<sup>26,27</sup>

Outcomes following HDL have been recently described in multiple retrospective reviews. Saad's retrospective case series of 50 men undergoing HDL categorized cases into high definition, moderate definition, and mild definition. The high-definition group had the highest patient satisfaction but the highest incidence of minor complications (21%).<sup>28</sup> High patient satisfaction with minimal morbidity was also noted in reviews of HDL cases by Nidaam<sup>29</sup> and Saad.<sup>30,31</sup> Danilla reviewed 417 patients who underwent HDL, 333 (80%) of whom were men, and 29% of those who underwent concomitant procedures. Most patients (94%) were happy with their results, there were no major complications, and minor complications included hyperpigmentation, seroma, nodular fibrosis, unsatisfactory definition, unnatural appearance, and VASER-related burns.<sup>32</sup> A large series by Agochukwu-Nwubah of 512 male HDL cases noted the only complication being contour defects in only 3 patients, with no infections, skin necrosis, or seroma.<sup>33</sup> Recently, a systematic review by Escandon reviewed data from 13 studies and 1280 male patients undergoing HDL. Most studies used power-assisted liposuction alone (6 studies) followed by conventional liposuction (4 studies) and VASER-assisted liposuction (3 studies). Overall satisfaction was high (84%–100%), and the most common complications were seroma, hyperpigmentation, contour irregularities, anemia, and port dehiscence.<sup>34</sup>

## SUMMARY

The market for male aesthetic surgery has increased exponentially over the last two decades. Male liposuction candidates historically included those with moderate to severe

lipodystrophy seeking a weight loss procedure. Now the demographic has morphed into one dominated by young, athletic men with mild to moderate lipodystrophy and high expectations for a sculpted and enhanced muscular appearance. A review of the literature supports a safe, reliable, and reproducible procedure in the appropriately selected patient. Surgeons can achieve favorable results with appropriate patient selection, preoperative counseling on realistic expectations, and adherence to the technical principles described in the literature.

## CLINICS CARE POINTS

- High-Definition Liposuction (HDL) is not suitable for all male patients. Careful patient selection is a critical prerequisite to ensure safe and reliable results.
- Surgeons must appreciate the unique anatomical characteristics of the fat, fibroseptal network and muscle groups in the area being treated. Liposuction of transition zones, dynamic contraction zones and unique muscular inscription arrangements is necessary to create a natural-appearing result.
- When HDL is performed concomitantly with excisional procedures, it is performed before skin resection. In order to ensure appropriately placed muscular inscriptions and transition zones following HDL, the preoperative markings must anticipate skin mobilization following closure.

## DISCLOSURE

Dr M.J. Stein and Dr A. Matarasso have no disclosure.<sup>13</sup>

## REFERENCES

1. Mendez BM, Coleman JE, Kenkel JM. Optimizing patient outcomes and safety with liposuction. *Aesthet Surg J* 2019;39(1):66–82.
2. Cosmetic surgery national data bank statistics. *Aesthet Surg J* 2017;37(suppl2):1–29.
3. American Society of Plastic Surgeons. Plastic surgery statistics report 2019: ASPS national clearinghouse of plastic surgery procedural statistics 2019. Available at: <https://www.plasticsurgery.org/documents/News/Statistics/2019/plastic-surgerystatistics-full-report-2019.pdf>. Accessed December 20, 2021.
4. Avelar J. Regional distribution and behavior of the subcutaneous tissue concerning selection and indication for liposuction. *Aesthetic Plast Surg* 1989; 13(3):155–65.

5. Mentz HA 3rd, Gilliland MD, Patronella CK. Abdominal etching: differential liposuction to detail abdominal musculature. *Aesthet Plast Surg* 1993;17(4):287–90.
6. Fodor PB. Superficial liposuction. *Aesthet Surg J* 1993;13:10–4.
7. Ersek RA, Salisbury AV. Abdominal etching. *Aesthetic Plast Surg* 1997;21:328–31.
8. Hoyos AE. High definition liposculpture. Presented in the XIII International Course of Plastic Surgery. Bucaramanga, Colombia, October 9, 2003.
9. Hoyos AE, Millard JA. VASER-assisted high-definition liposculpture. *Aesthet Surg J* 2007;27(6):594–604.
10. Markman B, Barton FE Jr. Anatomy of the subcutaneous tissue of the trunk and lower extremity. *Plast Reconstr Surg* 1987;80(2):248–54.
11. Rohrich RJ, Smith PD, Marcantonio DR, et al. The zones of adherence: role in minimizing and preventing contour deformities in liposuction. *Plast Reconstr Surg* 2001;107(6):1562–9.
12. Avram MM. Cellulite: a review of its physiology and treatment. *J Cosmet Laser Ther* 2005;6:181–5.
13. Mendez BM, Mendez BM, Coleman JE, Kenkel JM. Optimizing Patient Outcomes and Safety With Liposuction. *Aesthet Surg J*. 2019 Jan 1;39(1):66–82. *Aesthet Surg J*. 2019. <https://doi.org/10.1093/asj/sjy151>.
14. Kanaley JA, Giannopoulou I, Tillapaugh-Fay G, et al. Racial differences in subcutaneous and visceral fat distribution in postmenopausal black and white women. *Metabolism* 2003;52(2):186–91.
15. Rahman M, Temple JR, Breitkopf CR, et al. Racial differences in body fat distribution among reproductive-aged women. *Metabolism* 2009;58(9):1329–37.
16. Hoyos AE, Perez ME, Domínguez-Millán R. Variable sculpting in dynamic definition body contouring: procedure selection and management algorithm. *Aesthet Surg J* 2021;41(3):318–32.
17. Hoyos A, Perez M. Dynamic-definition male pectoral reshaping and enhancement in slim, athletic, obese, and gynecomastic patients through selective fat removal and grafting. *Aesthet Plast Surg* 2012;36(5):1066–77.
18. McKee DE, Lalonde DH, Thoma A, et al. Optimal time delay between epinephrine injection and incision to minimize bleeding. *Plast Reconstr Surg* 2013;131(4):811–4.
19. Hoyos A, Perez ME, Guarín DE, et al. A report of 736 high-definition lipoabdominoplasties performed in conjunction with circumferential VASER liposuction. *Plast Reconstr Surg* 2018;142(3):662–75.
20. Simão TS. High definition lipoabdominoplasty. *Aesthet Plast Surg* 2020;44(6):2147–57.
21. Hoyos AE, Perez ME, Domínguez-Millán R. Gynecomastia treatment through open resection and pectoral high-definition liposculpture. *Plast Reconstr Surg* 2021;147(5):1072–83.
22. Hoyos A, Perez M. Arm dynamic definition by liposculpture and fat grafting. *Aesthet Surg J* 2012;32(8):974–87.
23. Steinbrech DS, Sinno S. Utilizing the power of fat grafting to obtain a naturally-appearing muscular “6-pack” abdomen. *Aesthet Surg J* 2016;36:1085–8.
24. Hoyos AE, Perez ME, Domínguez-Millán R. Male aesthetics for the gluteal area: anatomy and algorithm for surgical approach for dynamic definition body contouring. *Plast Reconstr Surg* 2020;146(2):284–93.
25. Danilla S. Rectus abdominis fat transfer (RAFT) in lipoabdominoplasty: a new technique to achieve fitness body contour in patients that require tummy tuck. *Aesthet Plast Surg* 2017;41(6):1389–99.
26. Lehnhardt M, Homann HH, Daigeler A, et al. Major and lethal complications of liposuction: a review of 72 cases in Germany between 1998 and 2002. *Plast Reconstr Surg* 2008;121(6):396e–403e.
27. Kaoutzanis C, Gupta V, Winocour J, et al. Cosmetic liposuction: preoperative risk factors, major complication rates, and safety of combined procedures. *Aesthet Surg J* 2017;37(6):680–94.
28. Saad A, Altamirano-Arcos CA, Nahas Combina L, et al. Power-assisted liposculpture in male patients: a spectrum of definitions. *Aesthet Surg J* 2021;41(6):NP447–55.
29. Niddam J, Hersant B, Aboud C, et al. Postoperative complications and patient satisfaction after abdominal etching: prospective case series of 25 patients. *Aesthet Plast Surg* 2020;44(3):830–5.
30. Saad AN, Arbelaez JP, de Benito J. High definition liposculpture in male patients using reciprocating power-assisted liposuction technology: techniques and results in a prospective study. *Aesthet Surg J* 2019;40(3):299–307.
31. Saad A, Combina LN, Altamirano-Arcos C. Abdominal etching. *Clin Plast Surg* 2020;47(3):397–408.
32. Danilla S, Babaitis RA, Jara RP, et al. High-definition liposculpture: what are the complications and how to manage them? *Aesthet Plast Surg* 2020;44(2):411–8.
33. Agochukwu-Nwubah N, Mentz HA. Abdominal etching: past and present. *Aesthet Surg J* 2019;39(12):1368–77.
34. Escandón JM, Vyas KS, Manrique OJ. High-definition lipoplasty in male patients: a systematic review of surgical techniques and outcomes. *Aesthet Surg J* 2022;42(1):68–85.