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The Sculptor: An Ergonomic Tool for Enhanced Precision in High-definition Liposculpture

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Summary: The Sculptor is an innovative surgical instrument designed to improve precision, reproducibility, and surgeon comfort in high-definition (HD) liposculpture. Traditional liposculpture techniques rely heavily on the surgeon's manual and tactile skills, introducing potential variability in outcomes and contour deformities. Held in the surgeon's nondominant hand, the Sculptor guides the cannula for controlled fat removal. The Sculptor is compatible with traditional and power-assisted liposuction cannulas, but its use is contraindicated with energy-based devices. Its function is to provide a stable surface for contouring anatomical zones such as the linea alba, semilunar lines, and deltopectoral groove. By enhancing the contrast between positive and negative spaces, it contributes to more defined musculature in HD procedures. Since its introduction in 2021, the Sculptor has been used in 60 consecutive HD liposculpture procedures. Inclusion criteria were male or female patients with ectomorphic or mesomorphic morphology, a body mass index of less than 28 kg/m^2, and regular physical activity. Outcomes were assessed through clinical evaluation and patient-reported satisfaction at 6 and 12 months. No revision procedures were needed, and satisfaction was 100% at 1 year. Ten surgeons used the device without reported complications, and substituting the nondominant hand alleviated physical strain, improving comfort and focus. Preliminary observations suggest improved intraoperative ergonomics, reduced physical strain, and more reproducible outcomes. These initial findings are promising, but further comparative studies with larger cohorts and standardized methodology are needed to validate the observed benefits. *(Plast Reconstr Surg Glob Open 2025;13:e7061; doi: 10.1097/GOX.0000000000007061; Published online 13 August 2025.)*

INTRODUCTION

The Sculptor is an ergonomic instrument designed to enhance the precision and comfort of liposculpture procedures (Fig. 1). It has been developed over 2 years, involving research, development, and testing phases to ensure its effectiveness, safety, and ease of use in clinical settings.

On the upper section, 3 finger grips offer a stable, comfortable hold. The tool measures 12.05 cm in length and 3.78 cm in height, with a base shaped to mimic human surface contours and ensure a comfortable grip and control.

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The Sculptor is compatible with a broad range of traditional liposuction and power-assisted liposuction cannulas, but its use is contraindicated with energy-based devices, as the combination poses a risk of tissue burns due to heat accumulation. Energy-based devices can, however, be used before and after using the Sculptor.

During the procedure, the Sculptor is held in the nondominant hand and positioned over the preoperative markings (Fig. 2). The dominant hand guides the liposuction cannula through short (2–4 cm), low-amplitude mechanical movements, kept parallel to the muscle aponeurosis. The device preserves the structured technique described by Hoyos and Prendergast.[1]

The lower edge of the Sculptor serves as a physical guide, allowing the cannula to glide along its surface while limiting depth, thereby preventing unintended penetration.

Disclosure statements are at the end of this article, following the correspondence information.

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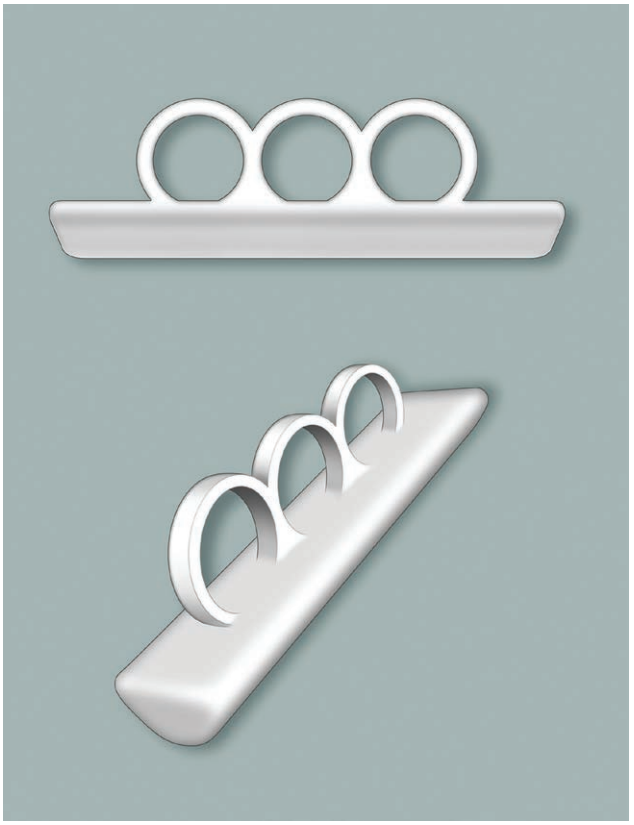

Fig. 1. An illustration of the Sculptor, front and three-quarter view.

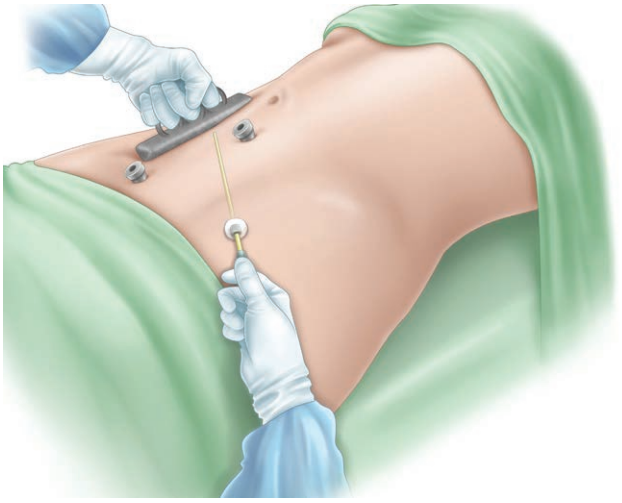

Fig. 2. An illustration of Sculptor usage during liposculpture, top view.

By enabling controlled, variable pressure on the skin and subcutaneous tissue, the device facilitates precise sculpting of contours and anatomical shadows, enhancing the contrast between positive and negative spaces for improved muscle definition.

The device is applicable for use in both male and female patients—primarily for moderate to extreme high-definition (HD) liposculpture in men and for select cases of extreme definition in women. However, HD liposculpture remains a niche procedure, with relatively few men pursuing aesthetic surgery and few women requesting pronounced muscular definition.

Anatomical zones targeted with the Sculptor include the linea alba, semilunar lines, tendon intersections of the rectus abdominis, oblique muscles, inguinal ligaments, "angel wings," the subpectoral region, lateral chest area, interpectoral zone, deltopectoral groove, and the erector spinae muscles along the medial and lateral borders.

Takeaways

Question: How can the precision, reproducibility, and aesthetic outcomes of traditional liposculpture be enhanced while reducing the physical strain on surgeons?

Findings: The Sculptor improved intraoperative control, reduced surgeon fatigue, and yielded consistent results with 100% patient satisfaction and no revisions at 1 year.

Meaning: The Sculptor may enhance surgical outcomes and reproducibility in high-definition liposculpture by improving control, consistency, and surgeon comfort.

DISCUSSION

According to the latest annual report from The Aesthetic Society, liposuction remains the most performed cosmetic procedure in the United States.[2] A 2024 systematic review and meta-analysis highlighted that contour deformity, with a prevalence of 2.35%, is the most frequent complication and leads to patient dissatisfaction.[2] Various techniques have been developed to address this issue, including separation, aspiration, and fatty equilibration liposuction, introduced by Wall and Lee,[3] which aims to optimize fat redistribution and reduce contour irregularities.

Additionally, plastic surgeons often experience significant physical challenges during procedures, including chronic musculoskeletal pain and fatigue.[4] The primary causes are poor posture and suboptimal ergonomics in the operating room, contributing to neck, back, and shoulder pain.[4,5]

In the specialized field of liposculpture, traditional methods for achieving detailed muscle contouring are labor-intensive and require considerable surgical expertise, notably for sculpting the rectus abdominis contours and their tendon intersections.[1,6] Typically, surgeons use the ulnar edge of their hand and the palm of their thumb to exert the necessary pressure for tissue modeling.[1,6] This method presents challenges, including inherent hand unevenness, which affect the precision of liposculpture, and the physical discomfort and strain from maintaining such hand positions during extended periods.

The Sculptor has been used in 60 consecutive HD liposculpture procedures since its clinical introduction in late 2021. The device was applied for moderate to extreme abdominal definition in male patients and occasionally in women for extreme definition.

Fig. 3. Preoperative view of a 46-year-old male patient before high-definition liposculpture.

Fig. 4. Postoperative view of a 46-year-old male patient 6 months after liposculpture of the abdomen, flanks, pectorals, and shoulders, using the Sculptor for sculpting the linea alba, semilunar lines, the rectus abdominis segments, and the subpectoral and interpectoral areas. Intramuscular fat grafting of the pectorals and shoulders was also performed.

Inclusion criteria were age 18–55 years, ectomorphic or mesomorphic body type, a body mass index of less than 28 kg/m^2, and regular physical activity (>3 h/wk).

Although there were no formal contraindications, patients with endomorphic morphology, sedentary lifestyle, or a body mass index greater than 28 kg/m^2 were excluded due to a reduced likelihood of maintaining results.

Postoperative outcomes were assessed via the following:

- Clinical visual evaluation at 1, 3, 6, and 12 months.
- Patient-reported outcomes, including the Apollon scale at 6 and 12 months and a standardized satisfaction rating at 12 months.
- Retouch rate within the first year.

The Sculptor improved intraoperative workflow by replacing the nondominant hand. Its stable surface allows the cannula to glide along a fixed guide, reducing the need for constant hand repositioning and minimizing physical strain. To date, 10 surgeons have used the Sculptor, all reporting improved comfort and concentration during procedures, especially during long operations, as less counterpressure and hand stabilization are required.

By stabilizing the cannula's trajectory and limiting its depth, the Sculptor reduces pressure variability and improves control over fat removal. This minimizes the risk of contour deformities, skin retraction, and asymmetries. The device enhances the contrast between positive and negative spaces, resulting in more consistent, well-defined musculature (Figs. 3, 4).

Perforation is a risk in all liposuction procedures.[7] Although the Sculptor removes tactile sensation, it provides indirect feedback. Preventing visceral injury requires keeping the cannula parallel to the abdominal wall and maintaining spatial awareness of both cannula and instrument. (**See Video 1 [online]**, which demonstrates the Sculptor on the linea semilunaris.) (**See Video 2 [online]**, which demonstrates the Sculptor on tendon intersections of the rectus abdominis.)

Among the first 60 patients treated with the Sculptor, no revision procedures were required within the first postoperative year. Satisfaction was high, with 100% of patients being "completely satisfied" at 1 year. No complications or adverse events related to the device were observed.

This preliminary report is based on early experience with a limited patient sample. No formal statistical analysis was conducted to compare outcomes with or without the device. Future studies, including controlled comparisons and larger sample sizes, are needed to validate these initial findings and further quantify the device's clinical benefits.

The Sculptor has shown consistent benefits in precision, efficiency, and patient outcomes in HD liposculpture. In our series of 60 patients, it contributed to improved ergonomics, enhanced contour definition, and a 100% satisfaction rate at 1 year, with no revision requests.

By standardizing sculpting maneuvers, the device addresses key limitations of traditional techniques. Although

these early results are encouraging, larger comparative studies are needed to validate its impact and assess long-term outcomes. The Sculptor seems to be a promising tool in refining HD body contouring.

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DISCLOSURES

The author is the inventor of the Sculptor and may benefit financially from its commercialization. The author entirely funded the development of the Sculptor and the preparation of this article.

PATIENT CONSENT

All patients provided informed consent for using their images in this publication.

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