

# Periumbilical Fascioplasty Improves Postabdominoplasty Umbilical Perfusion: An Approach to Reducing Umbilical Necrosis

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**Summary:** Abdominoplasty represents one of the most recognized operations performed by plastic surgeons. Despite its long history and ubiquity, the procedure retains a largely individualistic component, affected by a surgeon's artistry as much as by known clinical approaches. Consequently, complication incidence reporting has been variable, particularly that of umbilical dehiscence. This study aims to demonstrate the incorporation of periumbilical fascioplasty to reliably limit umbilical necrosis, particularly in cases where maximal rectus plication is desired. We present a series of 30 patients who underwent abdominoplasty at a single center under 1 surgeon between 2021 and 2024. Abdominoplasties were performed in standard fashion. Following extensive midline abdominal wall plication, the umbilicus is identified deep within the plication. Periumbilical fascioplasty is then performed by incising the anterior rectus fascia circumferential to the position of the umbilicus, releasing any adhesences to the underlying rectus muscle, and suturing the imbricated anterior rectus fascial segment onto the anteriorly exposed fascia, thereby anteriorly transposing the base of the umbilicus. This further eliminates the compression caused by the vertical vector of traditional midline plication while simultaneously displacing the umbilical base anteriorly. Abdominal skin is then transposed, and the umbilicus is externalized in the desired fashion. This approach resulted in 0 cases of umbilical skin necrosis and dehiscence. Although approximately 15 additional minutes are required in this process, the reduced need for follow-up corrective surgery should be considered. In applying this protocol, a surgeon may be more confident that they may achieve maximum midline plication while improving umbilical survivability metrics. (*Plast Reconstr Surg Glob Open* 2025;13:e6585; doi: 10.1097/GOX.00000000000006585; Published online 12 March 2025.)

## INCORPORATING BILATERAL PERIUMBILICAL HEMICIRCULAR FASCIOPLASTY INTO THE ABDOMINOPLASTY

Abdominoplasty is among the most frequently performed operations in plastic surgery, having been honed by generations of surgeons.<sup>1</sup> Appearance of the umbilicus is of particular concern as the center of the abdomen and

a locus for judgment of overall abdominoplasty appearance. Survival of the native umbilicus is often sought; however, umbilical necrosis is a well-known consideration.<sup>2</sup> Risk varies with the incorporation of concomitant operations; ventral hernia repair, in particular, has been associated with 0%–4.2% incidence, whereas overall incidence is as high as 28%.<sup>2–6</sup>

Although the etiology of umbilical dehiscence is contested, variable umbilical stalk perfusion postoperatively plays a role. Traditionally, blood supply is relegated to the umbilical stalk as deep inferior epigastric arteries (DIEAs) or umbilical perforators are disrupted.<sup>3,7</sup> These disruptions have historically been faulted for umbilical necrosis. Other etiologies for umbilical failure may include the traditional midline plication itself via a mechanical

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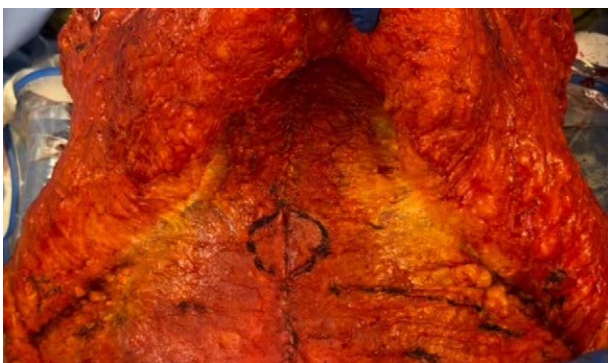
restriction of the blood flow, particularly when a tight plication is sought after.

This pilot study aims to describe the implementation of a distinct method for the preservation of the native umbilicus in a series of abdominoplasties. We believe bilateral periumbilical hemicircular fascioplasty offers improved survivability of the umbilicus in abdominoplasties.

A series of 30 patients underwent abdominoplasty between 2021 and 2024. Three of them underwent a fleur-de-lis approach, whereas the remainder had total abdominoplasties. Concomitant operations included panniculectomy (8), liposuction (7), breast surgery (13), ventral hernia repair (6), inguinal hernia repair (1), thigh lift (1), and DIEP (1).

Abdominoplasties begin in a standard fashion, incising along the lower abdominal marked line and dissecting the skin flap off the fascia along the costal edges to the level of the xiphoid. Periumbilical skin is detached from the umbilical stalk flap using a periumbilical oval incision and then dissected around the umbilical stalk, keeping a base with an approximately 3 cm radius.

Vertical abdominal wall plication is performed by suturing the anterior rectus fascia at moderate tension with multiple interrupted figure-of-8 sutures using 0-ethibond, followed by a simple continuous suture along the anterior rectus fascia from the level of the xiphoid to 2 cm above the superior aspect of the umbilicus; an additional simple continuous suture is placed starting from 2 cm below the caudal aspect of the umbilicus to the pubic tubercle. Plication is conducted with care to maintain symmetry and equal tension on either side. Following abdominal wall plication along the midline, the umbilicus is identified as deep and tight within the plication. In the setting of umbilical invagination or rectus contour irregularity, the bilateral hemicircular fascioplasty is marked (Fig. 1) and the anterior rectus fascia is incised. The incision along the anterior rectus fascia is performed approximately 2 cm from the midline plication representing anatomically the fascia closer to linea semilunaris. This allows the preservation of vascular perforators arising from the superior epigastric or DIEA with less compression and kinking. The medial invaginated anterior rectus



**Fig. 1.** An intraoperative photograph showing xiphoid to umbilicus and umbilicus to pubis midline plication of the linea semilunaris with markings for fascial incision placed along the anterior rectus fascia circumferential to the umbilicus.

## Takeaways

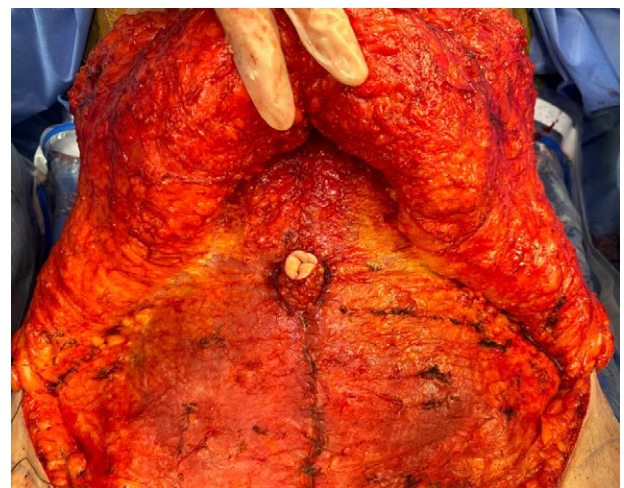
**Question:** Can reliable native umbilicus preservation be achieved in abdominoplasties via periumbilical hemicircular fascioplasty? We describe the implementation of our approach in a series of abdominoplasty cases, aiming to achieve more reliable survivability of the umbilicus.

**Findings:** A series of 30 patients underwent abdominoplasty at a single center under 1 surgeon between 2021 and 2024. All patients aimed for maximal waist reduction. No cases of umbilical necrosis or dehiscence occurred.

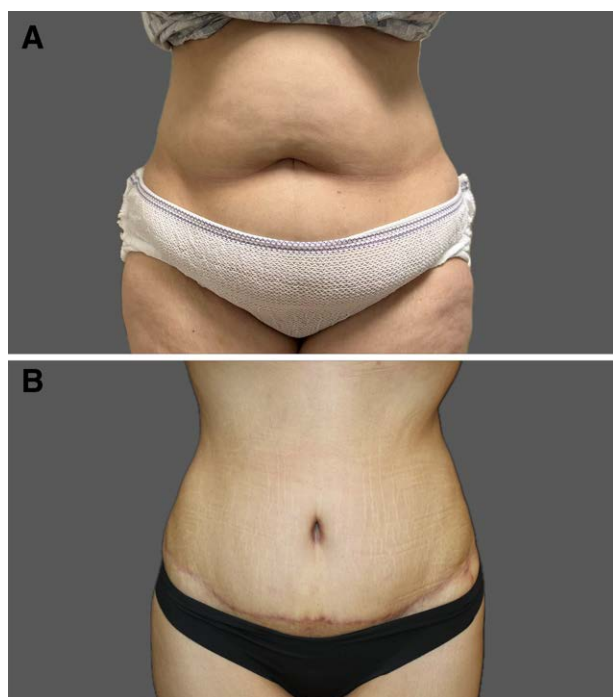
**Meaning:** Periumbilical fascioplasty eliminates compression caused by the vertical vector of traditional midline plication while simultaneously displacing the umbilical base anteriorly.

fascia is anchored onto the lateral anteriorly exposed fascia with interrupted figure-of-8 sutures with 0-ethibond. The circular nature of the hemicircular fascioplasty eliminates compression in the vertical vector of the traditional midline plication while displacing the umbilical base anteriorly (Fig. 2). The abdominal skin is then transposed, and the umbilicus externalized in the desired fashion. The author prefers the inverted “u” technique. (See Video [online], which displays the described methodology from vertical wall plication to umbilical externalization.)

Postoperative follow-up occurred in a standard fashion: weekly for 4 weeks, at 3 months, and at 1 year. This approach resulted in 0 cases of umbilical necrosis or dehiscence at 3 months. The patient umbilicus is depicted preoperatively and 1-month postoperatively (Fig. 3). No bulging or umbilical complications occurred, and no take-backs to the operating room were required. Postoperative complications included abdominal seroma ( $n = 3$ , 10%) and superficial skin necrosis along the abdominal line ( $n = 2$ , 6.6%).



**Fig. 2.** An intraoperative photograph showing an unstricted, anteriorly transposed, broad-based umbilicus following the bilateral hemicircular fascioplasty.



**Fig. 3.** A patient included in the operative cohort at presentation in clinic. A preoperative (A) and 1-month postoperative (B) photograph of a patient's umbilicus following the use of the described technique during abdominoplasty.

## DISCUSSION

Although various approaches for minimizing the likelihood of umbilical necrosis in abdominoplasty exist, there is no 1 true standard. A comprehensive review of umbilical necrosis incidence is unfortunately limited by its frequent listing as a minor wound complication.<sup>2,8</sup>

Our approach draws on fundamentals, preserving a wide base of the umbilical stalk for improved blood supply, and mitigates direct compression from a vertical plication that would otherwise diminish arterial perfusion; limit venous outflow, increasing congestion; and place the umbilical vascularization at risk. This encourages retention of the perforating branches from the DIEA until collateral flow can be reestablished postoperatively.<sup>2,9</sup> The additional steps taken to incise the rectus sheath and release laterally the fascia that was imbricated deep—thereby bringing the umbilical base out—act as a “safety rail,” preventing compression of the umbilical stalk by the approximated rectus abdominis and any medially compressive forces.

Application of our protocol in this cohort of abdominoplasties resulted in an umbilical necrosis rate equivalent to or better than that found in the literature.<sup>4–6</sup> When accounting for the underappreciation of this complication, our 0% incidence of umbilical necrosis more notably serves as a benchmark for comparison versus other approaches. Postoperative follow-up indicating no umbilical necrosis in 26 patients at 12 months and the same result at 3 months in the 4 most recent patients has affirmed our decision to continue using this technique—though long-term data including the use of control groups will

be required for stronger validation. Though our method did result in approximately 15 additional minutes of time spent operating, the assurance of a reduced need for take-back operations should be considered.

Incorporation of periumbilical anterior rectus fascioplasty offers a valuable tool for enhancing both aesthetic outcomes and vascular preservation in abdominoplasty, particularly in cases requiring extensive abdominal wall plication, such as patients with massive weight loss or multiparity. By releasing and reconfiguring the fascia, this technique addresses muscular contour irregularities, reduces constrictive vascular pressure, and ensures smooth rectus muscle function. Its application above the arcuate line minimizes risks, such as iatrogenic hernia, while maintaining umbilical survivability within favorable benchmarks. Further research and long-term data are essential to validate its efficacy and refine understanding of its role in managing this common complication in abdominoplasties.

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## DISCLOSURE

*The authors have no financial interest to declare in relation to the content of this article.*

## REFERENCES

1. Kelly HA. Report of gynecological cases (excessive growth of fat). *Johns Hopkins Med J.* 1899;10:197.
2. Lari A, Curings P, Person H, et al. Abdominoplasty with simultaneous laparoscopic umbilical hernia repair: a practical approach to preserve the umbilical vascularization. *Ann Chir Plast Esthet.* 2019;64:237–244.
3. Zingaretti N, Intini SG, Albanese R, et al. Umbilicus necrosis during mesh repair of rectus diastasis for abdominoplasty: practical tips for prevention and treatment. *Aesthetic Plast Surg.* 2023;47:28–31.
4. Neaman KC, Armstrong SD, Baca ME, et al. Outcomes of traditional cosmetic abdominoplasty in a community setting: a retrospective analysis of 1008 patients. *Plast Reconstr Surg.* 2013;131:403e–410e.
5. Kroll SS. Necrosis of abdominoplasty and other secondary flaps after TRAM flap breast reconstruction. *Plast Reconstr Surg.* 1994;94:637–643.
6. McCarty JC, Lorenzi-Mendez R, Fruge S, et al. Does concomitant umbilical hernia repair increase the risk of complications in abdominoplasty? A propensity score matched analysis. *Aesthet Surg J.* 2023;43:986–993.
7. Sava D, Nittari G, Gibelli F, et al. Survival of umbilicus on a superiorly based flap after fleur-de-lis abdominoplasty: a case report. *Medicine (Baltimore).* 2022;101:e29115.
8. Winocour J, Gupta V, Shack RB, et al. Abdominoplasty: risk factors, complication rates, and safety of combined procedures. *Plast Reconstr Surg.* 2015;136:597e–606e.
9. O'Dey DM, Heimburg DV, Prescher A, et al. The arterial vascularisation of the abdominal wall with special regard to the umbilicus. *Br J Plast Surg.* 2004;57:392–397.