



Body Contouring

Video Article

Improving Umbilical Aesthetics in Abdominoplasty Surgery: A Step-by-Step Technique Guide

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Abstract

Background: The umbilicus is a central aesthetic element of the abdomen. A natural-appearing, well-positioned, and inconspicuous umbilicus is essential for optimal abdominoplasty outcomes.

Objectives: To describe a reproducible umbilicoplasty technique that enhances umbilical aesthetics while minimizing visible scarring.

Methods: Between October 2021 and October 2024, 223 female patients underwent abdominoplasty using a standardized umbilicoplasty method. The approach includes an oval incision around the native umbilicus, repositioning at the midpoint between the xiphoid process and pubic symphysis, and an inverted crescent-shaped excision at the new site. The umbilicus is fixed to the rectus fascia, Scarpa's fascia is approximated, and the new umbilicus is shaped with precision. Postoperative care involves paraffin gauze and silicone plugs to preserve contour and prevent stenosis.

Results: The resulting umbilicus was small, vertically oval or circular, with superior hooding and a concealed scar. Patient satisfaction was high: 72.6% reported being highly satisfied, 21% satisfied, and 6.27% neutral. No cases of stenosis or necrosis were observed.

Conclusions: The authors described umbilicoplasty technique consistently produces aesthetically pleasing results, characterized by a small, vertically oval or circular umbilicus with superior hooding and a concealed scar. The high patient satisfaction rates suggest that this technique is effective in achieving a natural-looking umbilicus in abdominoplasty surgery.

Level of Evidence: 4 (Therapeutic)

The umbilicus, often referred to as the belly button, is the human body's first natural scar, forming after the healing of the umbilical cord at birth. Despite its origin, its size, shape, and position significantly contribute to the aesthetic harmony of the abdominal wall.^{1,2} Recent trends, including the increasing popularity of crop tops, bikinis, and social media, have heightened the visibility and aesthetic importance of the navel.³ Consequently, achieving a natural and inconspicuous umbilicus has become a critical goal in abdominoplasty procedures. The "ideal" umbilicus is influenced by several factors, including its position, size, depth, shape, and the visibility of scar tissue.^{2,3} Furthermore, its appearance evolves with age and parity; younger individuals typically present with a more vertically oriented umbilicus, which tends to become horizontal with advancing age, weight gain, or multiple pregnancies. Numerous techniques for creating an aesthetically pleasing umbilicus have been described in

the medical literature.⁴⁻¹⁰ However, many existing approaches often result in a circular scar, which can betray the surgical nature of an abdominoplasty.

This video article introduces the authors' technique for umbilicoplasty, aimed at minimizing scarring and replicating the

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characteristics of a natural umbilicus. The method replicates the ideal characteristics of a natural umbilicus adequate shape and size, a visible base with internal creases and folds, and a funnel-like structure while being straightforward to perform and delivering consistently natural-appearing results.

METHODS

Experience and Outcomes

A total of 223 female patients underwent abdominoplasty with the authors' umbilicoplasty technique between October 2021 and January 2025 and with specific shaping and suturing of the umbilicus. All procedures were performed under general anesthesia. This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. The study has been approved by the Gene Bandhu Ethics Committee (reference ECG014/2024). All patients provided written informed consent for their surgical procedures and the use of their de-identified clinical data and images for research and publication purposes. Detailed preoperative planning and precise surgical execution were consistently employed.

Surgical Technique

Preoperative Markings and Liposuction

Preoperative markings were performed with the patient in both standing and supine positions, consistent with standard abdominoplasty markings. All markings for placement and shaping of the umbilicus were performed intraoperatively (Video, available online at <https://doi.org/10.1093/asjof/ojaf164>).

After induction of General Anaesthesia, the patient was initially positioned prone, followed by supine. SAFE (Separation, Aspiration, Fat Equalization) liposuction was then performed on the lower back and abdomen. Subsequently, the abdominal flap was raised, and the umbilical stalk dissected. An oval periumbilical incision was made to circumferentially dissect the umbilicus, preserving excess periumbilical skin for later trimming. Supraumbilical dissection, rectus plication, and removal of the excess skin were then performed.

Umbilical Creation and Tension Sutures

The new umbilicus position was marked as an inverted crescent shape at the midpoint between the xiphoid process and pubic

Table 1. Patient Satisfaction Levels With Umbilical Appearance Following Abdominoplasty

Satisfaction level	No. of patients (n = 223)	Percentage (%)
Highly satisfied	162	72.6
Satisfied	47	21.1
Neutral	14	6.3
Dissatisfied	0	0.0
Very dissatisfied	0	0.0

symphysis. An inverted crescent-shaped section of skin was excised of 2 mm height and 1.5 cm width, over this marking. The upper edge of this inverted crescent is placed at the markings. This is followed by subcutaneous lipectomy to create a natural peri-umbilical depression. The lipectomy is done just below this incision and not around the umbilicus.

The umbilical stalk was then fixed to the rectus fascia at the 2 o'clock and 10 o'clock positions using 2-0 PDS sutures (Ethicon, Johnson & Johnson, New Brunswick, NJ). Progressive tension sutures were applied using barbed PDS from the xiphoid process toward the umbilicus along the midline to create a natural linea alba. Additional sutures were placed at the 12 o'clock and 6 o'clock positions of the umbilicus between the rectus fascia and Scarpa's fascia using 2-0 PDS sutures (Ethicon, Johnson & Johnson, Raritan, NJ) to create a natural depression at the new umbilicus position, which ensures the final suture line is concealed on the sloping wall of the umbilicus. This step also creates adequate depth for the umbilicus and effectively prevents the formation of a protruding or "outie" umbilicus.

Final Closure and Aesthetic Outcome

Once delivered through the abdominal flap, the separated umbilical stalk was sutured circumferentially using 3-0 Monocryl (Ethicon, Somerville, NJ) interrupted simple sutures. At this stage, any excess skin surrounding the umbilicus was precisely excised. Umbilicus excess skin is incised at 12, 6, 3, and 9 o'clock positions and appropriate tailor tacking of virgin umbilical skin is sutured. The initial skin edges of the umbilical opening, which may have been manipulated during handling, were trimmed to ensure that only virgin, untraumatized umbilical skin was used for the final closure at the new umbilical position. Finally, the abdominal wall closure was completed in layers. This technique consistently yielded aesthetically pleasing results characterized by minimal visible scarring, closely mimicking a natural umbilical appearance while ensuring functional integrity.

RESULTS

Postoperative Care

Postoperatively, the umbilicus is plugged with paraffin gauze for the first week to facilitate proper healing of the suture line. After 1 week, umbilical silicone plugs are inserted and left in place for a duration of 6 weeks to maintain the shape of the umbilicus and prevent stenosis.

Patient satisfaction and cosmetic results were assessed postoperatively. Satisfaction levels were measured using a 5-point Likert scale at the 6-month postoperative follow-up, with results

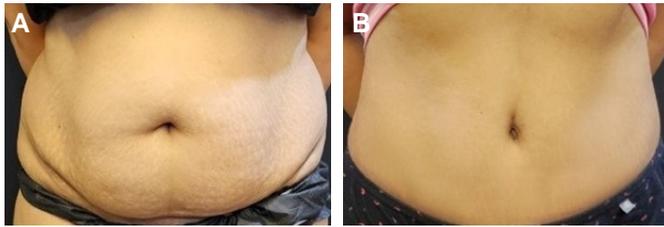


Figure 1. (A) Preoperative and (B) 24-week postoperative images of a 38-year-old female following abdominoplasty. Preoperatively, the umbilicus appeared “sad”-shaped with excess surrounding skin and fat. Postoperatively, the umbilicus demonstrates a youthful, vertically oriented shape with no visible suture line or scar.

detailed in [Table 1](#). Follow-up evaluations were conducted at 48 hours, 6 weeks, and 6 months to monitor healing and aesthetic outcomes ([Figures 1-3](#)).

Postoperatively, the findings demonstrated high satisfaction: none of the patients reported being very dissatisfied or dissatisfied with the outcome. The majority, 72.6% ($N = 162$), were highly satisfied with the aesthetic appearance of their umbilicus, while 21.0% ($N = 47$) were satisfied, and 6.3% ($N = 14$) remained neutral ([Table 1](#)). These results collectively underscore the effectiveness of our technique in achieving a natural and pleasing umbilical appearance.

DISCUSSION

Abnormal scarring or malposition of the umbilicus after abdominoplasty can lead to considerable distress and dissatisfaction among patients. Therefore, careful consideration must be given to its placement, dimensions, and form when repositioning the umbilicus during abdominoplasty.

Position of Umbilicus

The umbilicus's new position is determined by measuring half the distance between the xiphoid process and the pubic symphysis. This ensures that the ratio of the distance from the xiphoid to the umbilicus and from the umbilicus to the pubic symphysis is maintained at approximately 1:1, mimicking natural anatomy. Various authors have proposed different measurements and anatomical landmarks to guide its ideal positioning. Vernon recommended positioning the umbilicus 4 cm below the waistline.⁹ Abhyankar et al¹⁰ studied the anatomical localization of the umbilicus in 75 Indian female nulliparous patients under 30 years of age, with heights ranging from 145 to 165 cm. Their findings suggested that the ratio of the distance between the xiphisternum and the umbilicus to the distance between the umbilicus and the pubic symphysis is approximately 1.6:1, and the ratio of the distance between the umbilicus and ASIS and the interASIS distance is 0.6:1.² Dubou and Ousterhout¹¹ in his study of Placement of the Umbilicus in an Abdominoplasty on 100 non-obese subjects found that in 96 cases, the umbilicus aligns with the level of the iliac crest, which is approximately the midpoint between the xiphoid and the pubic symphysis. Similarly, in our technique, we position the umbilicus by measuring half the distance between the xiphoid process and the pubic symphysis. This ensures that the ratio of the distance from the xiphoid to the umbilicus and from the umbilicus to the pubic symphysis is maintained at approximately 1:1 closely following the original study by Dubou.

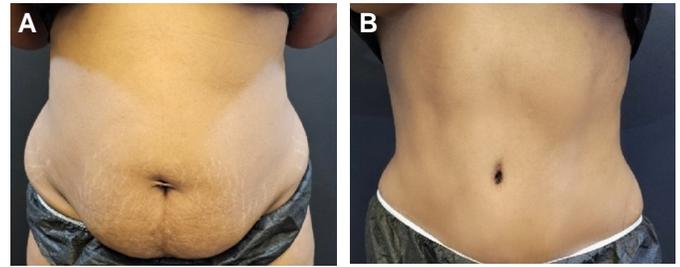


Figure 2. (A) Preoperative and (B) 24-week postoperative images of a 42-year-old female following abdominoplasty. Preoperatively, the umbilicus appeared distorted with skin overhang. Postoperatively, it demonstrates a youthful vertical orientation with the scar concealed along the sloping umbilical wall.

Incision Around the New Umbilicus Position

We use an inverted crescent shape incision, which specifically helps create a superior overhang or hooding and significantly enhances the aesthetic appearance of the umbilicus.¹² Similar outcome has been achieved by using crescentic excision of skin. Joseph et al¹³ in his systematic review of creating the perfect umbilicus showed the most variation in the incision shape on the abdominal flap for umbilical reinsertion with the most frequent patterns being round, inverted “V,” or inverted “U” incisions. Mejia in his technique of Colombian Clover umbilicoplasty described taking a cross incision in 1 cm radius.⁷ Thus, our technique closely resembles the ones followed in literature.

Size of Umbilicus

We believe that the opening created at the new umbilicus position should be sufficiently large to accommodate at least one finger's width. This ensures that the eventual umbilicus created is not overly small, maintaining a natural and visually appealing size. Various papers have described a wide range in the ideal size of the umbilicus. According to Lee et al,¹⁴ the ideal navel is oval, measuring about $5\% \pm 1\%$ of abdominal length (xiphoid to vulva). Visconti et al² found an average vertical-to-horizontal ratio of 1.4 ± 0.46 , indicating a vertically oriented navel with a shorter transverse diameter. Pallua et al¹⁵ reported an average navel size in women of 0.66 cm width and 1.05 cm height. Yu et al¹⁶ found larger values, with a mean height of 2.1 ± 0.6 cm and width of 2.3 ± 0.7 cm in young women. Studies like Hespe et al,¹⁷ Rozen et al,¹⁸ and Visconti et al,² create navels measuring 1.3-2.5 cm, which is comparable in size to the small finger (~1 cm) up to the thumb (~1.9-2.2 cm). Fell et al³ reviewed various articles to determine the ideal umbilical size and found that a smaller umbilicus is considered more aesthetically attractive. He now designs the umbilicus at 1 cm in length and 0.5 cm in width, which was identified as the smallest size that balances aesthetics with adequate hygiene.

Fixation to Rectus Fascia

Nahas et al fixes the umbilical pedicle to the anterior rectus sheath. According to Nahas et al, it gives the surgeon the ability to control the pedicle height and it also prevents the umbilicus from floating to the level of the abdominal skin flap. He also mentions the shortest pedicle height to be not less than 0.4 cm ie, 0.4 cm of free umbilical pedicle between the fixation of the aponeurotic pedicle and the skin.¹⁹ Similarly in our technique, the umbilical stalk is securely fixed

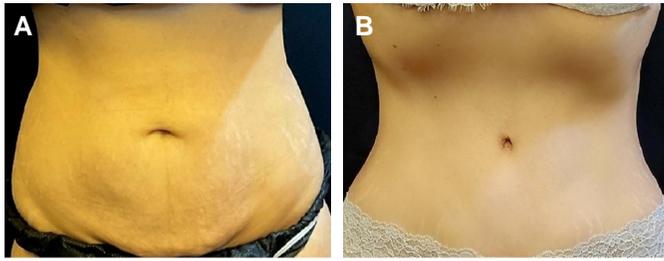


Figure 3. (A) Preoperative and (B) 24-week postoperative images of a 36-year-old female following abdominoplasty. Preoperatively, the umbilicus appeared “sad”-shaped with skin overhang. Postoperatively, it demonstrates a natural vertical orientation with no visible scar.

to the rectus fascia at the 2 o'clock and 10 o'clock positions. This crucial step creates adequate depth for the umbilicus and effectively prevents the formation of a protruding or “outie” umbilicus. Malic et al²⁰ also sutures the umbilical stalk with the rectus fascia, but at 6 o'clock position using monocryl 3-0.

Progressive Tension Suturing

We perform progressive tension suturing both superior and inferior to the umbilicus. This involves placing PDS sutures between the Scarpa's fascia in the abdominal flap and the rectus fascia. This maneuver helps create a concavity around the umbilicus, enhancing its visual appeal and natural appearance. Furthermore, it ensures the final suture line lies within the sloping wall of the umbilicus, thereby making it less visible. Hoyos et al in his technique of Dynamic Definition Mini-Lipoabdominoplasty takes a running suture that anchors the flap and umbilicus to the muscular fascia. From the xiphoid to the umbilicus, larger bites incorporating both superficial and deep fat (including Scarpa's fascia) are taken, which enhance midline definition, while below the umbilicus, sutures engage only the deep fat.²¹

Umbilicus Suturing

Once the umbilicus is delivered through the skin incision, any excess periumbilical skin is precisely excised. This approach ensures that virgin, native skin is used for the final closure, promoting better wound healing and a refined aesthetic outcome.

Strengths and Limitations

This study has notable strengths. It reports the patient series using the described umbilicoplasty technique in abdominoplasty, performed in a standardized manner by a single surgeon. Importantly, the technique had been developed and refined prior to the formal patient enrollment period (October 2021–October 2024), thereby minimizing confounding related to the surgical learning curve.

The limitations of this study include its retrospective cohort design, single-center and single-surgeon experience, absence of a control group, lack of blinded aesthetic evaluation, and restriction to female patients only, as no males were included in the cohort. Furthermore, although patient satisfaction with umbilical appearance was assessed using a self-created 5-point Likert scale, a validated patient-reported

outcomes instrument such as the Body-Q was not employed, and no statistical validation measures were applied to this scale.

CONCLUSIONS

The authors described umbilicoplasty technique consistently produces aesthetically pleasing results, characterized by a small, vertically oval or circular umbilicus with superior hooding and a concealed scar. The high patient satisfaction rates suggest that this technique is effective in achieving a natural-looking umbilicus in abdominoplasty surgery.

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