

# The dome procedure: a new technique for the reconstruction of the umbilicus

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## Abstract

**Purpose** The absence of the umbilicus is, in essence, an aesthetic deformity of the abdominal wall. The goal of reconstructing the umbilicus is to obtain a natural, three-dimensional appearance. In this study, we present a new technique called the “dome procedure” for the reconstruction of the umbilicus.

**Methods** This procedure can be applied under local anaesthesia on an outpatient basis and the drawing of the design is simple. The technique was applied to six patients who presented with an absence of the umbilicus following repair of a large incisional and umbilical hernia.

**Results** No major or minor complications were encountered. Patient satisfaction was high after surgical intervention.

**Conclusions** The dome procedure, which enables the umbilicus to have a natural appearance with sufficient depression and normal-appearing wrinkles, is simple, easy to perform, and safe.

**Keywords** Umbilicoplasty · Umbilical reconstruction · Dome · V–Y advancement flap

## Introduction

The umbilicus is an aesthetic component of the abdominal wall. The physical characteristics that contribute to an ideal umbilicus include size, shape, and location in the abdomen [1]. The shape of the umbilicus and its depth in the abdominal wall are perhaps the most important influential factors for cosmetic purposes and psychological well-being, and its absence, therefore, leads to an unnatural-looking abdomen. A normal umbilicus is located on the cranial tangential line of the bilateral iliac crests and the median line of the abdominal wall. The normal umbilical depression faces forward, not up or down, and a deep depression is preferred. The goal of reconstruction for umbilical loss/absence is to obtain an umbilicus with a natural three-dimensional (3D) appearance and sufficient depression [2]. Many techniques, including methods such as skin grafts and skin flaps, for reconstructing the umbilicus have been reported [3–13].

In this study, we report on a new technique called the “dome procedure” for the reconstruction of the umbilicus that is simple, easy to perform, and safe. We applied this technique to six patients who presented with an absence of the umbilicus following repair of a large incisional and umbilical hernia. Following this procedure, the umbilicus had a natural appearance with sufficient depression and normal-appearing wrinkles.

## Surgical technique

All surgical interventions were performed under local anesthesia. The superior edge of the iliac crest was used to determine the vertical height of the new umbilicus at the midline, and the site of the new umbilicus was

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marked on the abdomen. The umbilicoplasty technique was used to design three skin flaps resembling a dome shape. The procedure is shown comprehensively in Figs. 1 and 2. Using a dome-shaped incision, an inferiorly-based flap (c) of abdominal wall skin was elevated and the abdominal subcutaneous deep tissue was excised up to the fascia. The tip of the flap was then inserted into the abdominal fascia and sutured using 2-0 Vicryl coated (polyglactin 910) sutures. The separated dome-shaped incision was used to create two subcutaneous V–Y advancement skin flaps. The V–Y flaps (a–b) were then advanced to the donor site for the inferiorly-based flap, which was used to form the superior hood of the umbilicus. In other words, one-third of the inferiorly-based flap (c) (the apex of the flap) fitted into the cleft of the separated V–Y flap (a–b) and the adjacent margins were sutured. The donor site for the separated advancement flaps was closed with 3-0 Monocryl (poliglecaprone 25) sutures. The same technique was used in all cases.

## Results

Our case series covered six patients who had undergone an umbilical reconstruction between 2013 and 2014. The reconstructive procedures were undertaken after umbilical loss following previous incisional and umbilical hernia repair in four patients and abdominoplasty with simultaneous incisional hernia repair in two patients. No major postoperative complications, such as total flap necrosis, contracture and poor results, were observed; however,

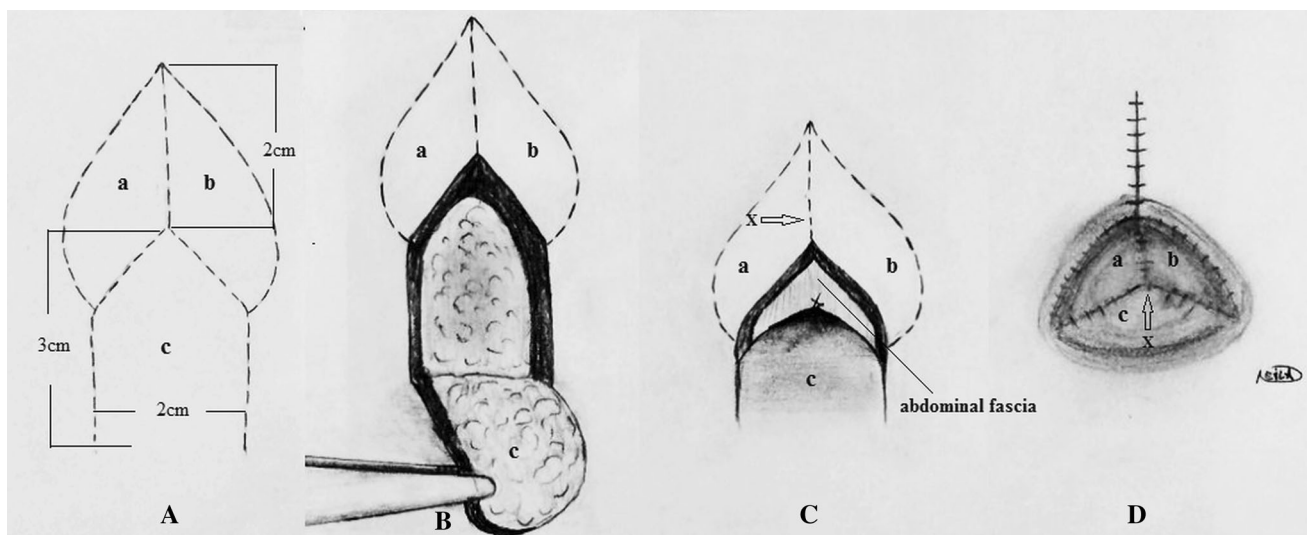
partial flap necrosis was identified in one patient. Patient satisfaction was evaluated using the visual analog scale (VAS) with scores from 1 to 100. Patients' features and VAS scores are summarized in Table 1. All patients were satisfied with their results. A representative case is presented in Fig. 3.

## Discussion and conclusion

In this study we presented a new technique called the “dome procedure” for the reconstruction of the umbilicus.

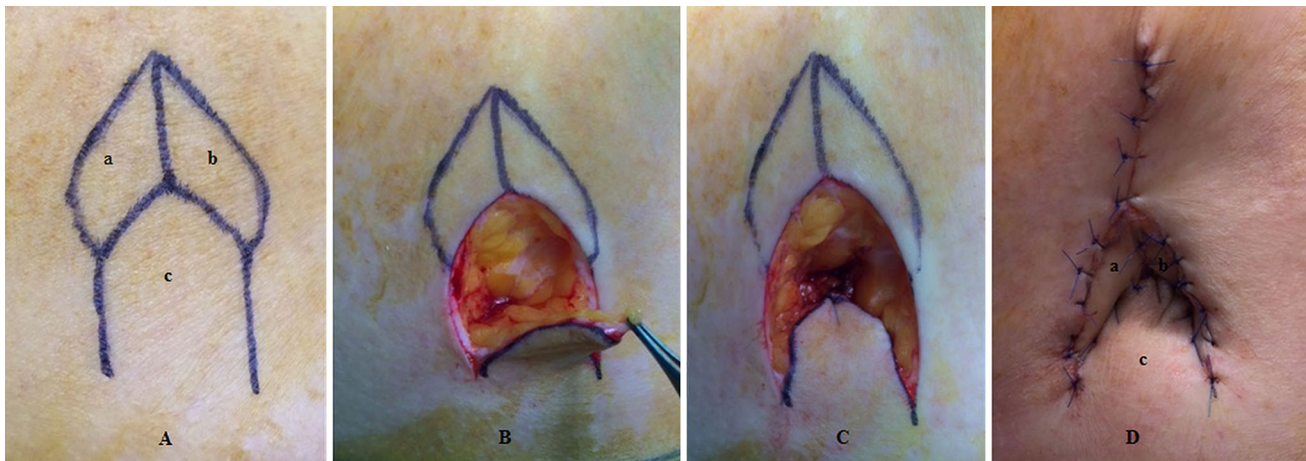
The important features of an aesthetically pleasing umbilicus include a central sulcus, vertical orientation, and a superior hood [1]. While inferior-based flaps provide a central sulcus and vertical orientation, advancement flaps allow the creation of a natural shape with a superior hood. The technique is simple and does not require the use of complicated skin flaps. The purpose of this simple technique is to create an umbilicus of adequate size, orientation and depth together with a natural shape.

The umbilicus is essential to the aesthetic appearance of the abdomen and its absence leads to an unnatural abdominal appearance. The physical characteristics that contribute to an ideal umbilicus include size, shape, and abdominal location [1]. A normal umbilicus is located on the cranial tangential line of the bilateral iliac crests and the median line of the abdominal wall, and has an umbilical depression facing forwards, rather than up or down. A deep umbilicus is considered ideal [2]. However, opinions differ on what a normal umbilicus should look like [1].



**Fig. 1** Schematic of the surgical procedure. **A** Design of the dome procedure. **B** Elevation of an inferiorly-based skin flap and excision of the subcutaneous tissue. **C** Transposition of the skin flap to the

abdominal wall fascia. **D** Creation of a superior hood with a separated V–Y advancement flap and the closure of the donor site defect



**Fig. 2** Intraoperatively view of the surgical procedure. **A** Design of the dome procedure. **B** Elevation of an inferiorly-based skin flap and excision of the subcutaneous tissue. **C** Transposition of the skin flap

to the abdominal wall fascia. **D** Creation of a superior hood with a separated V–Y advancement flap and the closure of the donor site defect

**Table 1** Patients' features and VAS scores

Patient	Cause of umbilicus loss	Major complication	Minor complication	VAS score	Follow-up time (months)
1	Incisional hernia	None	None	85	12
2	Umbilical hernia	None	None	80	9
3	Umbilical hernia	None	Partial necrosis	65	12
4	Abdominoplasty complication	None	None	75	12
5	Umbilical hernia	None	None	80	12
6	Incisional hernia	None	None	80	9

Many studies have reported on various techniques for the reconstruction of the umbilicus using methods such as skin grafts, skin flaps, and others [3–15]. Umbilical reconstruction using a skin graft is an effective method; however, the creation of a natural-looking umbilical wrinkle is difficult. The use of an inferior-based flap is similar to Hazani et al., but two advancement flaps were used instead of a skin graft in our technique [5]. Umbilical reconstruction with grafts requires both additional surgery and meticulous postoperative care. Therefore we believe that umbilical reconstruction using skin flaps would yield a better outcome than skin grafts.

A great concern in umbilical reconstruction is whether the structure is likely to flatten over the course of time. Our procedure provides a satisfactory depth to the umbilicus, allowing it to retain its shape in the long term.

Another challenge to successful umbilical reconstruction is the difficulty of creating a 3D natural-looking shape on a flat surface. Alternative flap techniques have been described, ranging from an islanded abdominal flap, a

superior-based single triangular flap, an inverted C–V flap, transverse flaps, and an inferior-based vertical flap, to a combination of skin flap and skin grafts [3–15]. Although various methods have been used for umbilical reconstruction, the ideal method has not yet been defined. Thus, studies of new techniques for reconstructing the umbilicus are urgently needed.

A large proportion of umbilical reconstructions result in an accompanying periumbilical scar on the skin of the abdominal wall [3, 7, 12, 13]. The only periumbilical scar resulting from our technique was a small vertical scar in the donor area for the advancement flaps.

Loss of the umbilicus, especially in women, is a psychologically unsatisfactory situation. Three local flaps, in the form of a dome, were used to perform umbilicus reconstruction in our study. This technique was applied to six patients. No major complications, such as total flap necrosis, contracture and poor results, were encountered. The results were found to be clinically and aesthetically satisfactory for all six patients.



**Fig. 3** Case 1 54-year-old female patient who underwent a complete excision of the umbilicus. **a** Preoperative view. **b** Design of the dome procedure. **c** Immediate postoperative view. **d** View at 6 month postoperative follow-up. The umbilicus appears to be well constructed with a good shape and acceptable scarring

We suggest, therefore, this simple dome technique, which yields satisfactory cosmetic results, for immediate or delayed umbilical reconstruction.

#### Compliance with ethical standards

**Conflict of interest** SŞ declares no conflict of interest, AÖ declares no conflict of interest, KG declares no conflict of interest and DE declares no conflict of interest.

#### References

1. Craig SB, Faller MS, Puckett CL (2000) In search of the ideal female umbilicus. *Plast Reconstr Surg* 105:389
2. Choudhary S, Taams KO (1998) Umbilicosculpture: a concept revisited. *Br J Plast Surg* 51:538
3. Yotsuyanagi T, Nihei Y, Sawada Y (1998) A simple technique for reconstruction of the umbilicus, using two twisted flaps. *Plast Reconstr Surg* 102:2444
4. Sugawara Y, Hirabayashi S, Asato H et al (1995) Reconstruction of the umbilicus using a single triangular flap. *Ann Plast Surg* 34:78
5. Hazani R, Israeli R, Feingold RS (2009) Reconstructing a natural looking umbilicus: a new technique. *Ann Plast Surg* 63:358
6. Borges AF (1975) Reconstruction of the umbilicus. *Br J Plast Surg* 28:75
7. Masuda R, Takeda A, Sugimoto T, Ishiguro M, Uchinuma E (2003) Reconstruction of the umbilicus using a reverse fan-shaped flap. *Aesthetic Plast Surg* 27:349
8. Bartsich SA, Schwartz MH (2003) Purse-string method for immediate umbilical reconstruction. *Plast Reconstr Surg* 112:1652
9. Itoh Y, Arai K (1992) Umbilical reconstruction using a cone-shaped flap. *Ann Plast Surg* 28:335
10. Marconi F (1995) Reconstruction of the umbilicus: a simple technique. *Plast Reconstr Surg* 95:1115
11. Ozbek S, Ozcan M (2005) Umbilicus reconstruction with modified ‘unfolded cylinder’ technique. *Br J Plast Surg* 58:500–503
12. Pfulg M, Van de Sijpe K, Blondeel P (2005) A simple new technique for neo-umbilicoplasty. *Br J Plast Surg* 58:688–691
13. Shinohara H, Matsuo K, Kikuchi N (2000) Umbilical reconstruction with an inverted C–V flap. *Plast Reconstr Surg* 105:703–705
14. Teixeira Cesar, Nogueira DSC (2012) A new umbilical reconstruction technique used for 306 consecutive abdominoplasties. *Aesth Plast Surg* 36:1009–1014
15. Lee Y, Lee SH, Woo KV (2013) Umbilical reconstruction using a modified inverted C–V flap with conjoint flaps. *J Plast Surg Hand Surg* 47:334–336