Umbilical Reconstruction with Double Opposing Semilunar Flap, an Appealing Results

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ARTICLE INFO

Keywords:
Umbilical
Reconstruction
Flap

ABSTRACT

Umbilical loss is not a common problem encountered in plastic surgery routine cases. The absence of umbilicus will cause significant effect in total aesthetic appearance of the abdomen, thus making it an essential part of anatomy landmark. Congenital defect, oncologic and abdominoplasty complication are the most often causes, and tremendous psychological trauma will cause patient to seek help. There are many proposed technique for such reconstruction, based on original scar or wound and final expected shape, of course with their advantages and disadvantages. We used a double opposing semilunar flap for our cases. Along with its technical detail, we will present three cases comprises of the defect after omphalocele scar removal, umbilical endometriosis excision and postcentral abdominal tumor excision. Reports will be presented with preoperative and postoperative result.

Although the umbilicus is depressed and adheres to deep planes, it is the only scar in the human body that is acceptable to individuals. Its absence significantly affects the aesthetics of the abdomen, making it an essential part of the anatomy.

The aesthetic appeal of the abdomen is directly related to good umbilical conformation. Reconstruction of the umbilicus either after its loss or for aesthetic reasons must follow the anatomical features to provide a natural appearance after treatment. The new umbilicus should have a good shape and appropriate position; should not have an unaesthetic appearance, stenosis, or enlargement; and should have a natural appearance.

The umbilicus is a depressed scar surrounded by a natural fold of skin approximately 1.5 to 2.5 cm in diameter.^{1,2} Its natural position is at the height of the line joining the highest point of the 2 anterior superior iliac crests; this point is located between the third and fourth lumbar discs.³⁻⁵ The position in the vertical plane is known to vary, and in cases where it is located more anteriorly, the umbilicus provides a more graceful-looking abdomen.³ Regarding the sagittal plane, the umbilicus exhibits laterality up to 8% of the width of the abdomen in 98.3% of subjects.⁴ It is formed by a base, which corresponds to the corrugated part surrounded by a groove or ring. Its upper portion, which surrounds the

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depressed portion, is called the impeller. The umbilicus should be small, have a T-shaped depression, be round or oval, and have a slight fold of skin on its upper portion.^{1,5}

This article reports a technique for the reconstruction of the umbilicus employed in the surgical treatment of two patients.

PATIENTS & METHODS

This study carried out 3 patients that comprise of the defect after umbilical endometriosis excision postcentral abdominal tumor excision, and post congenital defect scar removal. The patients were female, 55, 36, and 8 years old has referred to plastic surgery department to close the defect with umbilical reconstruction.

To reconstruct the umbilicus either because of its absence or for aesthetic reasons, we used 2 parallel rectangular flaps with double opposing semilunar design as previously described by Franco et

al.⁶; the flaps were sutured together and fixed to the aponeurosis of the rectus abdominis muscles. These flaps were 1.5 × 2.0 cm wide but somewhat larger flaps may be used in certain cases. The flaps exhibited a curvilinear-shaped skin transition rather than right angles, with the double opposing semilunar design. (Figure 1).

Figure 1. Marking of the flaps, with a double opposing semilunar design.

Figure 2. Immediate postoperative appearance, Female 57 years old (upper left) – Female 36 years old (upper right) – Female 8 years old (bottom)

The flaps were attached at 2 parallel points that reached the dermis of the flap on both sides and the aponeurosis in its median line. Thus, we obtained the union of 2 flaps, which were slightly compressed in the distal portion.

Next, the fat tissue around the umbilicus was approximated with new points using 1 Vicryl (polyglactin) and a 4 cm needle. The needle must be sufficiently large to include the maximum possible amount of fat tissue. Care must be taken when crossing points to avoid making the sutures too tight, which can cause liponecrosis. The procedure was completed with skin suturing.

RESULTS

Two patients underwent reconstruction of the umbilicus while considering the anatomical units. The formation of all anatomical units was noted, including the base, groove, and impeller, and adequate depth was achieved in all reconstructed umbilical scars.

There were no cases of umbilical stenosis. Similarly, no hypertrophic or keloid scars were observed on the new umbilical, although

pathological scarring occurred in the vertical scar above or below the umbilicus.

The reconstructed umbilical scars had good size and excellent shape, as is observed in Figures 3 to 5.

Figure 3. Female, 57 years old patient, H-19 post Operative.

Figure 4. Female, 57 years old patient, H-26 post Operative.

DISCUSSION

The reconstruction of the umbilicus remains challenging for plastic surgeons. Various techniques are described in the literature, including the use of local flaps.^{4,5} Although these techniques provide some reasonably aesthetic results, they remain unable to yield a natural-looking new umbilicus. In order for the reconstruction to be as close to ideal as possible, the anatomical units of the element to be treated must be suitably reconstructed.

This paper presents a double opposing semilunar flap technique proposed by Franco et al. that involves rebuilding the anatomical units (i.e., base, groove, and impeller) in a stepwise manner.⁶ The base is formed at the aponeurosis by 2 fixing flaps, compressed at the distal edge. Because the dermal layer is included in the suture of the flap, the flaps fold, which gives the appearance of a groove.

Figure 5. Late postoperative appearance. Female 57 years old (upper left) - Female 36 years old (upper right) - Female 8 years old (bottom).

The proximity of the adjacent fat tissue to the new umbilicus raises the edges around it, thus providing the required depth. The sutures should not be too tight at those points in order to avoid necrosis of the adjacent tissue and liponecrosis. Because the flaps are short, there is a bend in the skin around the new umbilicus, which forms the impeller. Therefore, all anatomical structures are rebuilt, giving a natural final appearance. Some ptosis is expected to occur on the skin located in the upper portion of the umbilicus over time, forming a discreet fold that gives a more natural look to the final reconstruction. Using

flap sizes of 1.5 to 2.0 cm ensures that a small and smooth umbilicus is obtained.

The major difficulty of the reconstruction of the umbilicus is making the new umbilicus sufficiently deep, particularly when the patient presents a scarce adipose panniculus. By ensuring the adjacent fatty tissue is included, the present technique resolves this issue. Maintaining a curve in the base of the flap rather than a right angle to the approach avoids the formation of edges, thereby achieving a more rounded umbilicus and avoiding one that is elongated and closed.

CONCLUSIONS

The technique for reconstruction of the umbilicus presented here accounts for the anatomical units, provides a very natural look, and generates slight excess of skin on the upper part over time, giving a more graceful appearance. The resultant umbilicus exhibits

appropriate features of depth and size. This technique avoids the appearance of scarring and secondary stenosis by hiding the circular scar incision and maintaining its position in the middle of the new form.

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