Original Article

Vertical relocation of the umbilical scar in abdominoplasty of Bozola and Psillakis Group IV cases – standardization of procedures

Realocação vertical da cicatriz umbilical em abdominoplastias do grupo IV de bozola e psillakis – padronização tática

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ABSTRACT

Introduction: The navel is the only natural visible scar on the body. It is an essential part of abdominal aesthetics, making umbilicoplasty critical for the success of abdominoplasty. The position and natural contour are the two important factors that are most relevant in evaluating the aesthetic result of the umbilical scar. Classifications and standards are important tools to improve the diagnosis and refine the treatment of abdomen aesthetic disorders. Furthermore, it has facilitated appropriate reproduction of the procedure and served as a basis for comparative studies. Objectives: This study presents the author's experience with procedure standardization for repositioning and re-implantation of the umbilical scar in abdominoplasty group IV cases. The study demonstrates the navel vertical relocation technique, along with details of the new position, and assesses the quality of results obtained and the degree of patient satisfaction. **Methods:** Twenty female patients underwent the procedure between May 2010 and May 2012. The minimum follow-up period was thirty days and the maximum follow-up period was two years. **Results:** Most results were considered excellent, with a high level of patient satisfaction and no major complications. There was no need for re-intervention. The technique was shown to be safe, simple and easy to perform. **Conclusion:** The marking and surgical planning, with a proposed maximum end limit for repositioning of the umbilical scar, can be valuable both in aiding the most complex diagnoses of aesthetic abdomen defect types and evaluating the technical aspects of abdominoplasty that are most appropriate for treatment.

Keywords: Umbilicoplasties; Abdominoplasties; Navel; Umbilical Scar; Omphaloplasty.

RESUMO

Introdução: O umbigo é a única cicatriz natural visível do corpo. É parte essencial da estética abdominal, fato que torna a umbilicoplastia fundamental no sucesso da abdominoplastia. A posição e a naturalidade de contorno são os dois fatores mais relevantes na avaliação do resultado estético da cicatriz umbilical. Classificações e padronizações têm sido ferramentas importantes para aprimoramento do diagnóstico e refinamentos no tratamento dos distúrbios estéticos do abdome. Além disso, têm facilitado a reprodutibilidade dos procedimentos e servido de base para estudos comparativos. Objetivos: Apresentar a experiência do autor com uma pa-

Institution: Work conducted in the Nilton Lins Hospital (NLH) and in the Outpatient Hospital, both in Manaus City, with patients at the private clinic of the author.

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dronização tática para o reposicionamento e reimplante da cicatriz umbilical em casos de abdominoplastias do grupo IV. Demonstrar a tática de realocação vertical do umbigo com detalhamento da nova posição, avaliar a qualidade do resultado obtido e o grau de satisfação das pacientes. **Métodos:** Vinte pacientes, todas do sexo feminino, foram submetidas ao procedimento entre maio de 2010 e maio de 2012. O período mínimo de acompanhamento foi de trinta dias e o máximo, de dois anos. Resultados: A maioria dos resultados foi considerada excelente, atingindo alto nível de satisfação das pacientes, sem apresentar grandes complicações. Não foram necessárias reintervenções. A técnica mostrou-se segura, simples e de fácil execução. **Conclusão:** A marcação e o planejamento cirúrgico, com a proposta de um limite caudal máximo para o reposicionamento da cicatriz umbilical, podem ser de grande valia tanto no auxílio aos diagnósticos mais complexos dos tipos de defeitos estéticos do abdome quanto nas indicações das técnicas de abdominoplastias mais adequadas ao tratamento.

Descritores: Umbilicoplastias; Abdominoplastias; Umbigo; Cicatriz Umbilical; Onfalopastia.

INTRODUCTION

Ratings and standards are fundamental tools for the development and dissemination of knowledge in diverse areas. Plastic surgery has historically used these strategies to consolidate itself as a real science and as an effective method of studying and learning.

Since the late 19th century, abdominoplasty with wide transverse resection[1] has been performed and improved by surgeons worldwide. However, in 1988, Bozola and Psillakis[2] developed a classification of existing aesthetic variations (according to anatomical errors) in abdomens, and consequently, this surgical procedure was cemented as a practice of scientific and reproducible character.

In recent years, several factors have led to major changes in the profile of patients that are candidates for abdominoplasty. More comprehensive and early access to plastic surgery has resulted in an increase the number of younger female patients whose aesthetic changes were more moderate and whose demands for less invasive procedures and more natural results were higher.

In this context, the importance of group IV abdominoplasty grew not only through increased usage but also through the demands for greater technical refinement, mainly in relation to navel scars. Such epidemiological changes have resulted in an increase in the number of complicated diagnoses due to borderline anatomical differences between two groups of classification, especially between groups IV and V—a situation that imposes complex decision-making upon the surgeon on whether or not a surgical scar around the navel should be generated.

Within the aesthetic composition of the abdomen, the navel occupies a prominent position. Thus, umbilicoplasty plays a fundamental role in the success of any abdominoplasty[3]. Several omphaloplasty techniques[4-11] have been described. However, there has never been any great emphasis on the repositioning of the umbilical scar, as its position is maintained in most cases. Aesthetic contour is also a concern, including the depth and quality of the periumbilical surgical scar. In the treatment of group IV abdomens only, in which the navel occupies a high position and causes injury to the portion between the supra- and infraumbilical segments, we observe a real and effective change in the umbilicus scar position. The umbilicus is mobilized together with the abdominal flap, which made it unnecessary to make the scar on mini-T and resulted in a horizontal scar that is lower and of better quality.

Our objectives are to present the author›s personal experience in a series of twenty cases with abdominoplasty group IV. Umbilicoplasty (reimplantation of the umbilicus scar) was performed following a specific standardization proposal for the redefinition of two important naval aesthetic characteristics—vertical position and contour. Details of the vertical relocation of the umbilicus scar with a proposal for a minimum height are described. The quality of the results were evaluated together with the patients by assigning classifications (excellent, good, fair and poor) for the abdominoplasty as a whole and the navel alone.

METHODS

Between May 2010 and May 2012, 20 female patients aged 26 to 42 years (mean, 34 years) with a history of at least one pregnancy were selected for the operation. Other inclusion criteria were the desire of the patient for abdomen cosmetic improvement and an aesthetic classification of group IV of the abdomen by a surgeon after a detailed physical examination.

Patients were excluded if they were males, did not have any history of pregnancy, had previous abdominal surgery, or had an aesthetic classification of the abdomen that was not group IV.

All patients were subjected to a set of routine preoperative tests, were evaluated for surgical risk by a cardiologist, and attended a pre-anesthetic consultation.

The procedures were performed in private hospitals in Manaus, by the same surgeon and staff. All patients received anesthesia through an epidural block with 2% levobupivacaine and intravenous sedation with midazolam. The average duration of surgery was four hours, depending on whether concomitant liposuction was also performed on the same day. Based on preoperative risk stratification, all patients wore pneumatic compression boots intermittently and were subjected to other necessary measures to prevent thromboembolism.

Techniques

A marking with a dermographic pen was made with the patient standing (inguinal folds) and sitting with a slightly flexed trunk to highlight natural skin folds of the abdomen and enable the demarcation of the suprapubic incision. While standing, the midline of the abdomen was marked from the xiphoid process to the pubic symphysis. With the patient in the supine position, the longitudinal length of the abdomen (xiphoid-symphysis) was measured, recorded, and demarcated in the midline. The position corresponding to one-third of this measure from the pubic symphysis was termed point "U" (Figure 1). This point denotes the lowest position at which the umbilical scar can be reimplanted after removal of the skin fuse to prevent disfigurement by poor positioning of the navel. The difference between the symphysis-navel distance and the symphysis-point U distance is that the distance between point U and the original umbilical scar is a much better estimate of amount of the skin fuse to be removed by abdominoplasty. However, the exact definition of the fuse size varies between patients according to sagging, skin type, the presence of streaks, and, especially, the amount of skin to be removed after detachment.

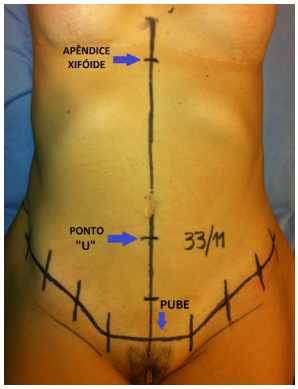

Figure 1: *Average xypho-pubic line (33 cm) and point "U" (1/3 of the distance; 11 cm from the pubis).*

In cases where there were thicker adipose tissues in the anterior abdominal face and/or presence of localized fat in the back and flanks, wet liposuction was conducted in these regions after infiltration of a 1:500,000 solution of epinephrine.

The abdominoplasty was initiated with an incision in the suprapubic region up to the side of the demarcation and, following the usual sequence, an opening was made by detaching the planes and abdominal flap in the supra-aponeurotic plane to the navel area. The umbilical pedicle was carefully isolated (Figure 2) by blunt dissection and, where possible, major paraumbilical arteries were preserved. After isolation of the pedicle, the navel was disengaged in the fair-aponeurotic anatomical plane. Special care was taken with the possible presence of small umbilical hernias, which were properly treated at this stage.

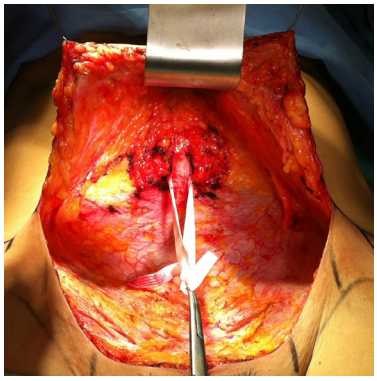

Figure 2: *The dissected umbilical pedicle is carefully repaired to allow detachment and treatment of any hernias.*

After detachment of the umbilical scar, detachment continues cranially to the xiphoid process. In cases where liposuction was not performed on the anterior face of the abdomen (thin adipose tissue), detachment had the same amplitude as that carried out in abdominoplasty of Group V abdomens. In patients with a thick panniculus, prior liposuction limited the detachment to a tunnel on the xifoumbilical middle line, whose lateral limits were the middle edges of the rectus abdominis muscle, as recommended by Leão[12]. To complete the detachment, a plication of the rectus abdominis muscles with two rows of suture was performed—one with simple points and separated by "X" and another with crossed continuous points—using non-absorbable monofilament nylon suture thread with a gauge of 0, for correcting the diastasis. With the patient in a mild flexion position (15°), the detached abdominal flap was mobilized in the craniocaudal direction and the excess skin was removed.

Umbilicoplasty (navel reimplantation) - standardized tactic

After resection of the skin fuse, the umbilical scar was repositioned and reinserted in the aponeurosis in the linea alba. The definition of the new position of the navel was made according to the reduction of abdominal flap after the removal of excess skin. However, this position should never be more caudal (lower) than the previously marked point U. That is, the distance between the pubic symphysis and the new position of the umbilical scar should never be less than 1/3 of the abdominal longitudinal length (xiphoid-symphysis distance), since this would result in major aesthetic damage.

The method of attachment (reimplantation) of a stan-

dard navel in this study consisted of only one anchored point made with monofilament nylon thread with a gauge of 2.0 and supported by a 1/4 piece of sterile gauze soaked in antibiotic ointment and shaped into a ball. The points of needle transfixation in the abdominal flap corresponded to the side edges (left and right) of the transverse diameter of the navel.

Figure 3: *Needle transfixation points at A in the abdominal flap.*

The distance between the point of entry and exit of the needle passing through the aponeurosis was similar to the skin. Thus, larger and wider navels had transfixation points that were located further apart, thus maintaining the original features of the navel circumference. (Figure 3)

After the umbilicoplasty, hemostasis was attempted, the adhesion points of the flap to the aponeurosis (Baroudi points) were noted, and the suction drain was positioned. The abdominoplasty was closed with suture in the layers of the abdominal flap, with particular attention to the suture plan of the superficial fascia to prevent scar retraction and depression. The drain was removed within 5–10 days (mean, 7 days) after the procedure and the anchoring point was removed around day 15 postoperatively. After the first 30 days, patients were asked about their satisfaction with the resulting aesthetics of the abdomen and navel and to assign a rating of "bad", "good", "very good" or "excellent". The surgeon also evaluated the operation.

RESULTS

The patients in this study rated the results of abdominoplasty as good (5%), very good (35%), or excellent (60%). When asked specifically about the navel, an absolute majority (90%) classified the aesthetic appearance of the umbilical scar as excellent. Factors such as natural contour and absence of scars were the aspects that were considered most important to the success of umbilicoplasty.

In all cases, there was a very significant improvement of the aesthetics of the abdomen and corrections of anatomical errors were successful. In 90% of patients, the umbilicoplasty technique used here allowed the maintenance of existing skin folds on the inner face of the umbilical scar, which contributed to the satisfaction of the patients. In 2 cases (10%), there was an associated umbilical hernia, leading to an elimination of these folds and a less natural navel in relation to other patients.

In this study, no serious complications were recorded. We observed only 1 case (5%) of seroma, which was addressed using three punctures and local compression, and no surgical reintervention was necessary.

DISCUSSION

Abdominoplasty is a plastic surgery procedure that has a wider range of technical options for its implementation. Over the last century[4], several methods have been developed, enhanced, and modified. Umbilicoplasty, a continuously fundamental part of abdominoplasty, has also been the subject of many studies and technical refinements, as patients have increasing demands regarding the cosmetic results of the umbilical scar in abdominal correction procedures.

Many publications have presented a variety of techniques, but most of them use neo-omphaloplasty, where the skin around the navel or umbilical scars is incised[4–9,16,17] or completely removed, creating a "false navel" [10,11]. However, in cases classified as group IV, external incisions around the navel can and should be avoided. In such cases, the position of the umbilical scar undergoes a change, with displacement in the craniocaudal direction, which is paramount in defining the new position of the navel. Several authors have attempted to define the ideal position of the umbilical scar[13–16]. Since there is no consensus, based on a literature review, we proposed a caudal point limit (minimum height) for repositioning the navel, while allowing the removal of a greater amount of skin without disfigurement.

Surgeons performing abdominoplasty with umbilicoplasty are faced with two major challenges: correct diagnosis and the achievement of more natural results[17].

Even with the establishment of a classification system for anatomical variations of abdomens, dividing them into five groups,[2,18] and guidance in the diagnosis of aesthetic disorders, there are situations where the line separating one group from another is very tenuous. Less experienced surgeons may encounter many pitfalls. In this context, making the correct diagnosis becomes difficult and the search for objective criteria that lead to the best decision is important. In the demarcation presented in this work, the rough estimate of the maximum amount of skin that can be removed without damage to navel repositioning prevents greater errors in diagnosis and serves as support for the framework of the abdomen in a group IV or V abdomen or in cases that fall between the two groups. This measurement is obtained from the original position of the umbilical scar and the point U—the lowest point for reimplantation. The mathematical definition of the umbilical scar position is also valuable, and allows the surgeon to identify whether the case belongs to group IV and to exclude cases where the original position of the umbilical scar was equal to or less than 1/3 of the xiphoid-pubis distance.

To achieve a natural result, the standardized umbilicoplasty technique in this study is extremely effective, since the navel retains its own characteristics after reimplantation. A normal navel has "skin folds" in its inner face, due to the "prints" left by vascular structures connected at this site during the fetal stage of development. Reimplantation of the navel, made through a single anchored point[18], was not only very

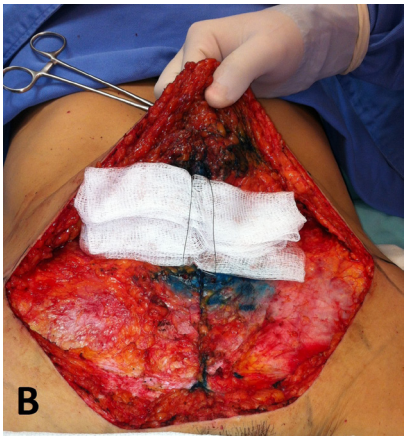

Figure 4: *Passing of the wire at B through the abdominal flap and aponeurosis in the linea alba.*

secure, fast, and easy to implement, but was also very effective in maintaining these folds, resulting in significantly more natural results. The absence of external scars also allowed the gradual re-establishment of the characteristic "hood top" present in umbilical scars[19] by gravity (Figure 4).

The proposition of a «minimum height» (most caudal point) for navel repositioning, presented in this work, is an important tool in group IV abdominoplasty. It can be used as an objective reference for both the maximum magnitude of traction to be excised in the flap and the range of skin fuse resection.

CONCLUSION

The specific standardization proposal in this study allows the highly safe execution of abdominoplasty in group Iv abdomens as described by Bozola and Psillakis. The techniques and technical refinements presented for umbilicoplasty (marking and implementation) will be of great importance for both the diagnosis and the achievement of more natural results.

REFERENCES

1. Kelly HA. Excision of fat of the abdominal wall lipectomy. Surg Gynec Obstet. 1910; 10: 229.
2. Bozola AR, Psillakis JM. Abdominoplasty: a new concept and classification for treatment. Plast Reconstr Surg. 1998; 82(6): 983-93.
3. Akbas H, Güneren E, Eroglu L, Uysal AO. Natural-looking umbilicus as an important part of abdominoplasty. Aesth Plast Surg. 2003; 27: 139-42.
4. Lee MJ, Mustoe TA. Simplified technique for creating a youthful umbilicus in abdominoplasty. Plast Reconstr Surg. 2002; 109(6): 2136-40.
5. Pfulg M, Van de Sijpe K, Blondeel P. A simple new technique for neo-umbilicoplasty. Br J Plast Surg. 2005; 58(5): 688-91.
6. Massiha H, Montegut W, Phillips R. A method of reconstructing a natural-looking umbilicus in abdominoplasty. Ann Plast Surg. 1997; 38(3): 228-31.
7. Furtado IR. Onfaloplastia: técnica "infinito". Rev Bras Cir Plást. 2011; 26(2): 298-301.
8. Daher JC, Benedik A, Faria CA, Amaral JL, Rodrigues-Neto JN, Cosac OM, et al. Umbilicoplastia: experiência com a técnica do minicirculo de pele. Rev Bras Cir Plast. 2011; 26(2): 302-5.
9. Freitas JOG, Guerreiro V, Sperli AE. Neo-onfaloplastia na dermolipectomia abdominal: tecnica do duplo "V". Rev Bras Cir Plast. 2010; 25(3): 504-8.
10. Ng JAA. Abdominoplastias: neo-onfaloplastias sem cicatriz e sem excisão de gordura. Rev Bras Cir Plast. 2010; 25(3): 499-503.
11. Amud RJM. Neo-onfaloplastia sem cicatriz. Rev Bras Cir Plast. 2008; 23(1): 37-40.
12. Leão C. Curso de abdominoplastia. Chair man: Bozola AR: In: Anais do XXXVII Congresso Brasileiro de Cirurgia Plástica; 2000 nov 11-15; Porto Alegre-RS, Brasil.
13. Abhyankar SV, Rajguru AG, Patil PA. Anatomical localization of the umbilicus: an Indian study. Plast Reconstr Surg. 2006; 117(4): 1153-7.
14. Bozola AR. Abdominoplasty: same classification and a new treatment concept 20 years later. Aesth Plast Surg. 2010; 34: 181-92.
15. Leão C. Lipodorsoabdominoplastias: 10 anos de experiência. Rev Bras Cir Plast. 2010; 25(4): 688-94.
16. Pallua N, Markowicz MP, Grosse F, Walter S. Aesthetically pleasant umbilicoplasty. Ann Plast Surg. 2010; 64(6): 722-25.
17. Mazzochi M, Trignano E, Armenti AF, Figus A, Dessy LA. Long-term results of a versatile technique for umbilicoplasty in abdominoplasty. Aesth Plast Surg. 2011; 35(4): 456-62.
18. Bozola AR, Bozola AC. Abdominoplastias. In: Melega JM, Baroudi R, eds. Cirurgia plástica fundamentos e arte: cirurgia estética. Rio de Janeiro: Medsi; 2003. p. 609-23.
19. Koshy CE, Taams KO. Umbilicoplasty. Plast Reconstr Surg. 1999; 104(4): 1203-4.

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