

## New techniques

### Authors:

Flávio Barbosa Luz<sup>1</sup>

Luciana Antunes Chagas<sup>2</sup>

<sup>1</sup> Associate Professor of Dermatology, Universidade Federal Fluminense (UFF) – Niterói (RJ), Brazil

<sup>2</sup> Sixth year medical student, Universidade Federal Fluminense (UFF)

### Correspondence:

Dr. Flávio Barbosa Luz

Rua Guapiara, 78 - Tijuca

Cep: 20521-180 – Rio de Janeiro – RJ, Brazil

E-mail: flavioluz@Dermatologista.net

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## Post-adjusted M-plasty

### *M-plastia pós-ajustada*

### ABSTRACT

Post-adjusted M-plasty can be used in any surgical defect that can be closed by direct approximation of the borders to avoid the formation of apical protrusions. It is performed without prior planning; the tissue is removed only if the surgeon detects a protrusion during surgery. This method offers the advantage of sparing healthy tissue by adjusting the incisions to each patient's skin's tension lines, wrinkles and junctions of cosmetic units, in addition to the possible use of the "M"'s pedicle as a small advancement flap. This study describes the procedure step by step, highlighting the differences and advantages compared to traditional M-plasty.

**Keywords:** surgical procedures, minor; ambulatory surgical procedures; abdominal wound closure techniques.

### RESUMO

*M-plastia pós-ajustada pode ser usada em qualquer defeito cirúrgico passível de fechamento por aproximação direta das bordas, evitando formação de protrusões apicais. É realizada sem planejamento prévio, sendo retirado tecido somente quando houver protrusão percebida pelo cirurgião no ato cirúrgico. Possui as vantagens de poupar tecido sadio, adaptar as incisões às linhas de força, rugas e unidades de junção cosmética de cada paciente, além da possível utilização do pedículo do M como pequeno retalho de avanço. Neste trabalho, é relatado o passo a passo desse procedimento cirúrgico, evidenciando suas diferenças e vantagens quando comparado à M-plastia tradicional.*

**Palavras-chave:** procedimentos cirúrgicos menores; procedimentos cirúrgicos ambulatoriais; técnicas de fechamento de ferimentos abdominais.

### INTRODUCTION

M-plasty, first described by Webster in 1976,<sup>1</sup> is a surgical closure technique in which an "M-shaped" area is excised on one or both extremities of the surgical wound. It is used to prevent apical protrusions ("dog ears"), which can be caused by drawing together the borders of round lesions; this action compresses the tissue – especially in angulated points – and forces it upward and outward. M-plasty was developed as an alternative to fusiform excision, and results in a smaller loss of healthy tissue and shorter scars.

In 1984, Salasche<sup>2</sup> used the M-plasty technique mainly to repair "dog ears" after the emergence of the protrusions, corresponding to the establishment of the post-adjusted M-plasty.

Improvements have since been introduced to the technique. In 1986,<sup>3</sup> Asken proposed the formation of a brim in the "M" shape after the fusiform excision of the wound. In 1988, Camacho<sup>4</sup> proposed an asymmetry in the size and shapes of the

lateral sections of the “M” in the same extremity of the surgical defect. In 2009, Wisco and Wentzell<sup>5</sup> recommended increasing the distance between the lateral sections of the “M” to more than 30°.

Post-adjusted M-plasty is carried out using the same technique as traditional or modified M-plasty, except that there is no prior planning. In this way, the lesioned tissue is excised normally; tissue elevations in the border are excised using the above-mentioned method if the surgeon notices them at the beginning of the repair procedure. This approach allows not only the elimination of the apical protrusions (as proposed by Salashe<sup>2</sup>), but also an improvement in the positioning of the incisions on the skin's tension lines, wrinkles, or at cosmetic junction units, in addition to saving healthy tissue. This technique variant's main objective is to achieve a better post-surgical aesthetic result.

### TECHNIQUE

The post-adjusted M-plasty method is illustrated by the following sequence of pictures (Figure 1):

A. Surgical defect

B. After the detachment of the tissue around the surgical wound, a central suture is carried out in order to approximate the borders.

C. After the central suture is implemented, the apical protrusions become evident.

D. Lateral incisions are carried out at the appropriate angle in order to minimize healthy tissue loss or to avoid affecting anatomical structures.

E and F. Sections of the triangle and the resulting formation of an “M.”

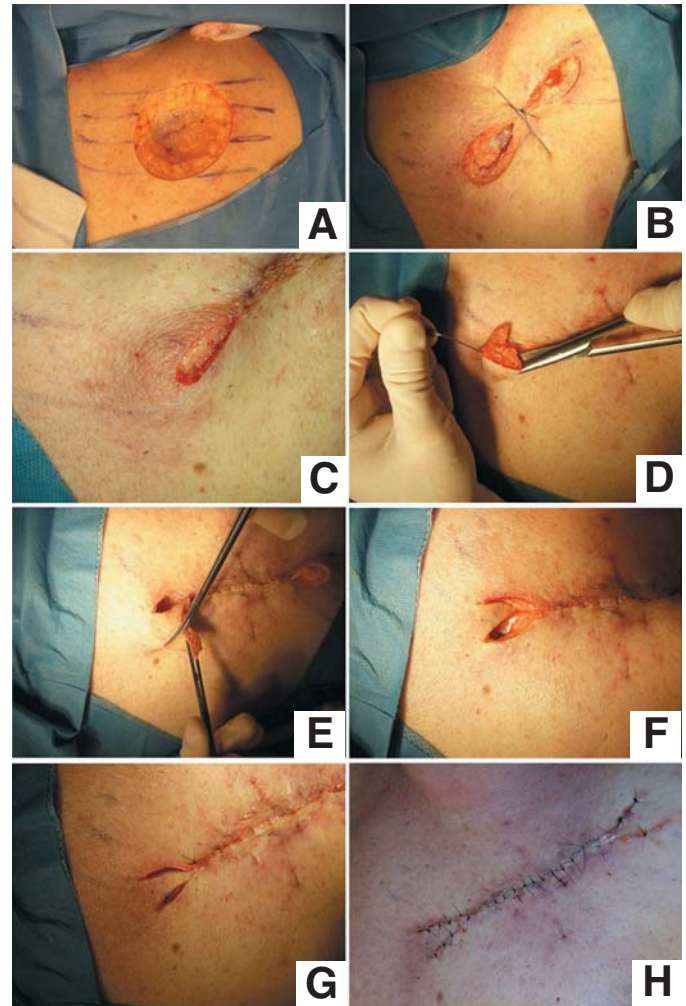
G. Medial approximation and anchorage of the pedicle of the “M” – some tension-based advance can be used.

H. Suture of the entire surgical defect with simple stitches.

### DISCUSSION

Post-adjusted M-plasty can be performed whenever the direct approximation of the tissue borders is possible. This technique can also be used in situations where there is considerable tension, provided that there is extensive detachment of the adjacent tissue. The main objectives of this technique are: 1) to spare healthy tissue from being excised during the reconstruction, 2) to reduce the size of the scars, and 3) to improve the aesthetic result by better positioning of the scars.

Webster<sup>1</sup> recommended a maximum 30° angle for the cutting of the triangles in excisions with smaller apical angulations in order to prevent the formation of “dog ears,” despite the greater loss of healthy tissue. According to Wisco and Wentzell,<sup>5</sup> this original M-plasty technique does not take into account the tissues' dynamic movements. Salashe<sup>2</sup> observed that the surgical defect often assumes an oval shape after its closure, due to the skin's natural tension lines. After the distribution of this tension following the central suture and detachment of adjacent tissues, the amount of tissue to be excised and the appropriate angle of the “M” become evident. Therefore, it is best to perform the M-



**Figure 1:** A. Surgical defect; B. Central suture for the approximation of the borders; C. Apical protrusions (“dog ears”) are formed; D. Lateral incisions; E and F. Triangle sections and resulting formation of the “M”; G. Medial approximation and anchoring of the M's pedicle; H. Wound's synthesis

plasty after this initial spontaneous adjustment of the tissue, allowing the post-adjusted M-plasty's main objectives to be reached.

Wisco and Wentzell<sup>5</sup> initially proposed that M-plasty should be conducted using Webster's approach,<sup>1</sup> however with the lateral sections of the “M” located at a similar or greater distance as the surgical defect's height. Increasing the distance between the M's lateral sections widens the apical angle, thus progressively diverging the site's tension vectors and decreasing the compressive forces in the brims.

In modified M-plasty,<sup>3</sup> a fusiform excision is initially carried out with a subsequent incision parallel and lateral to the surgical defect, in one or both poles, depending on the location of the lesion. A brim is then formed in the desired extremity, according to the M-plasty approach, shortening the excision and better adapting the scars to the local tension lines. This is particularly important in the periorbital areas, to avoid distor-

tions in the surrounding tissue and the nasal region, where the scar's contraction can lead to a deformity in the wing of the nose.

Camacho<sup>4</sup> proposed another alteration to traditional M-plasty, which has a good aesthetic outcome: a modification in the size and shape of the M's lateral sections in a single extremity of the wound, which allows the removal of two triangles of different sizes. This approach allows the maintenance of the tissue in its natural position and adapts to each patient's natural folds.

Another important point is the use of the M's pedicle as a small advance flap. Wisco and Wentzell<sup>5</sup> also describe the attachment of the pedicle towards the center of the surgical wound after its central closure (not advancing the pedicle more than is necessary for its accommodation). With the medial advance of the brim as a flap, there is a decrease in the tension in the region near the center of the surgical wound, which provides a better accommodation of the tissue and results in a more aesthetic surgical scar.

Unlike the proposals by Webster<sup>5</sup> and Star<sup>6</sup> in 2001, "a vertical mattress tip stitch" was used in the post-adjusted M-plasty to anchor the pedicle. This method provides a better closure, without causing protrusions in the tip of the brim, and keeps the pedicle's vascular supply intact and prevents the eversion of the wound's border. The suture is started using a far-far pattern and must be located in the reticular dermis, a few millimeters from

the surgical border. When returning, the near-near pattern is used; the sutures are made 1 mm from the wound's border and do not cross the deep papillary dermis. The M's brim tip must be horizontally transfixed in the near-near stage, reaching the opposite border.

In general, post-adjusted M-plasty corresponds to the modifications suggested by Asken<sup>3</sup> and Camacho<sup>4</sup> to the "dog ears" repair technique proposed by Salasche.<sup>2</sup> If this concept is expanded, the M's pedicle could be possibly pulled towards the center, working as a small advancement flap to decrease the tension medially in the scar. As a result, post-adjusted M-plasty not only repairs "dog ears," but also has an active role in the reconstruction of the wound, in the dissipation of the tensions involved, and in the better positioning of the surgical scars.

## CONCLUSION

Post-adjusted M-plasty allows a greater amount of untouched tissue to be spared. As in the attempt to avoid apical protrusions, there is no previous marking and the protruding tissue area is excised as necessary. Since this procedure is tailored according to the skin's tension lines, the technique can be adjusted to each patient, resulting in greater precision in the repair. Moreover, it is possible to use the M's pedicle as a small advancement flap, resulting in a more aesthetic scar. ●

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