

Z-plasty: method of tension release in contracted scars secondary to burn

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Case Report

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Background: The skin is a protective barrier against external factors and its damage leads to a loss of its integrity, increasing the risk of multiple complications. An adequate recovery from a wound results in the formation of a flat, shiny and flexible scar, however the degree of initial damage, as well as factors dependent on the patient himself, can cause hypertrophic or keloid type scarring, and even the appearance of contracture scars, which not only entails cosmetic changes, but also the presence of chronic pain, and the limitation of ranges of mobility, negatively affecting the patient's quality of life. (1)(2)(4)

Z-plasty is a commonly used reconstructive surgical technique for scar release, which involves the transposition of 2 or more opposing elevated flaps along a shared axis.(1)

Keywords: Z-plasty, Scar, Contracture scar.

Z-plasty is a reconstructive surgical technique commonly used for scar release. This consists of the transposition of 2 triangular flaps that change direction to improve alignment with the natural folds of the skin, as well as to reduce tension, and improve movement restriction. One of the benefits of this procedure over other types of scar revision techniques is that it does not necessarily require tissue excision, and is actually considered an option for tissue conservation.(1)(2)

Z-plasty involves the transposition of 2 or more opposing elevated flaps along a shared axis. This changes the direction of the scar to more easily hide it within the edges in facial regions, or to relax skin tension lines. Another of its important functions is to release the contracture of scars secondary to burns.(1)(3)

There are different types of techniques when addressing contracture scars, but the most effective is the Z-plasty and its variations. Its basic principle is the transposition of flaps, using the adjacent laxity of the tissues, it can lengthen the scar, especially when it is narrow and linear.(2)

Common variants of this technique are the following: planimetric z-plasty, double-opposed z-plasty, composite z-plasty, skewed z-plasty, and serial z-plasty. (1)(2)

Case report

A male patient in his sixth decade of life, who approximately 34 years ago suffered a burn from solvents and hydrocarbons, occupying 70% of his body surface. Currently with consequences of a contractile scar at the axillary level that causes

difficulty in right armpit movements, complicating the extension and flexion of the forearm.

-Family inheritance history

He denies genetic load for systemic arterial hypertension, denies genetic load for diabetes mellitus, cancer and kidney pathology.

-Non-pathological personal history

He lives in his own home, has all the basic services, with good ventilation and lighting, negative zoonosis, no overcrowding, daily bath with a change of clothes, good oral hygiene, feeding 3 times a day in good quantity and quality, denies smoking, denies social alcoholism and drug addiction. Allergies denied. Transfusions 34 years ago (unknown number of units), hemotype (O+).

-Physical examination

Vital signs: BP 140/85 mmHg, HR 82 bpm, RR 18 rpm, Temperature 36.2°C, Oxygen saturation 97%.

Normal chest, with retractable scar, in the right hemithorax, which extends towards the axillary region, and right arm, and towards the ipsilateral abdominal region. Amplexion y amplexation movements preserved. Lung fields with adequate vesicular murmur, without the presence of rales or wheezing, cardiac area with rhythmic sounds, of adequate intensity, tone and frequency. Right upper extremity with limitation of abduction above the shoulder, up to 50%, approximately 90°.

Surgical procedure of Z-plasty of scars in the right hemithorax with extension to the right axillary region was performed on January 24, 2026, achieving extension of the scar and increasing in the range of mobility of the right shoulder joint up to approximately 110°, evidencing an increase of 20°.

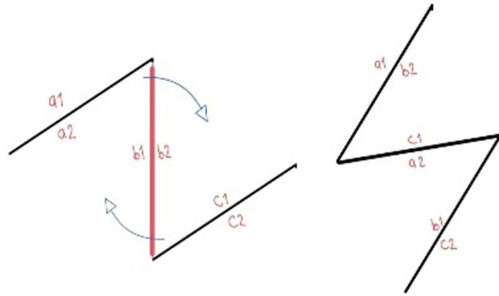


Figure 1. Basic principle: Opposite triangles of equal angles are transposed to a central incision along the line of tension. The result is the rupture and lengthening of the scar tissue and the redirection of the scar, perpendicular to the initial one.

Discussion

Scar formation is part of the wound healing process. If any alteration occurs during this healing process, this can result in the excessive formation of scar tissue, not only complicating the aesthetic results of the wound, which entails social and psychological repercussions for the patient, but also causing the loss of ranges of mobility, which results in a significant decrease in quality of life.(1)(2)(3)(4)

Most patients are unaware of adequate care and the existence of surgical techniques that exist to correct these complications, which is why in many cases the treatment of this type of injury is delayed. The presence of contracted scars is one of the complications with the greatest impact, hence the importance of knowing the different types of procedures aimed at the treatment of this type of injuries, with Z-plasty surgical treatment being the most used procedure and with the best results.(3)(4)



Figure 3. a-b These are the immediate post-surgical results of the Z-plasty.



Figure 4. This is the result 5 weeks after surgery, where scar tissue is observed without tension.

Conclusion

Scar formation is part of the wound healing process. The incidence of contracted scar formation increases when one or more of the steps of wound recovery are affected. Z-plasty remains one of the best therapeutic methods in this type of case; achieving not only an improvement in the aesthetic appearance of the injury, but also, speaking of a scar that limits the function of a joint, it manages to once again increasing its functionality and the patient's quality of life.



Figure 2. Sixth decade male patient with the presence of a chronic retractile scar secondary to direct fire burns, with limitation of abduction of the arm over the shoulder. The images a-d are the design of the Z-plasty.

Conflicts of interests

The authors declare that there are no financial, personal, or institutional conflicts of interest that could have influenced the work reported in this manuscript.

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