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Research Article

CURRENTLY, THE MOST UNIQUE METHOD IS: THE METHOD OF PLASTICIZING THE POST-BURN SCAR DEFORMATION OF THE HAND USING AN INTRAOPERATIVE BALLOON

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ABSTRACT

In this article, the author proposed a method for plasticizing post-burn scarring of the hand using intraoperative balloon stretching. The effectiveness of treatment was studied in 42 patients who underwent plastic surgery using intraoperative balloon stretching of the hand tissues. The patients were divided into 2 groups: group 1 consisted of 25 and group 2 of 17 patients. 85.8% of patients in the main group had good and satisfactory results. In the comparison group, these figures were 73.3%. Based on this, the proposed method of plasticizing post-burn scarring of the hand with intraoperative balloon stretching made it possible to increase the results by 12.5%.

KEYWORDS

Scar, post-burn deformity, intraoperative balloon stretching, hand.

INTRODUCTION

The relevance of the problem: Anatomical and functional disorders in burn injury have special features inherent only to it. Unlike mechanical injury in burns, the lesion spreads over a larger area of the human body, and prolonged inflammation of the tissues leads to scarring not only in the burn area, but also far beyond it, which often leads to the development of stiffness and contractures of even unaffected joints of the hand. The primary lesion of tissues deeper than the skin is infrequent and most contractures of the hand at the beginning have a dermato-desmogenic character [4,5]. However, even in these cases, when the secondary inflammation of the underlying tissues is insignificant and degenerative-dystrophic changes have not occurred in them with the outcome of scarring, the elastic properties of the restored skin are sharply reduced. The restored skin undergoes retraction in the first 3 months, its surface shrinks and the area decreases by 30-40%. From the beginning of the 4th month, deretraction begins, the area of the restored skin gradually increases, wrinkles disappear. A year later comes the third period of stabilization, the

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area of transplants reaches 95% of the original [1,2,6]. According to E. A. Bautin, deretraction does not occur in 8% of operated patients, which entails the severity and persistence of deformities and contractures of the hand. Retraction and deretraction depend on the condition of the scar tissue located under the graft. In a healthy person, the movement of the skin during brush movements due to subcutaneous tissue and normal elasticity of the skin occurs at a considerable distance from a large joint, in burned people the possibility of such movements is sharply limited, which contributes to the development of stiffness and contractures. Finally, burn injury is characterized by a simultaneous lesion of several joints (with widespread deep thermal burns, as a rule, 2-3 limbs are damaged and, consequently, the function suffers 4 – 6 – 8- and joints at the same time). A slight limitation of the function of one joint individually with multiple lesions leads to a pronounced or significantly pronounced decrease in the function of the entire limb as a whole [3,7].

Thus, the urgency of the problem is determined by:

- the inconclusive resolution of such issues as the timing of surgical intervention in post-burn deformities of the hand, its volume, the optimal thickness of the transplanted skin grafts, the simultaneous elimination of multiple lesions;
- an undifferentiated approach to performing various methods of reconstructive operations in patients with scar deformities of the hand;
- the existing pattern in the choice of methods of surgical treatment of patients with cicatricial deformities of the hand;
- the frequency of observed cases of relapses after the operations performed;
- Based on the above, the following goals and objectives were set in this work.

The aim of the work is to improve the results of surgical treatment of patients with the consequences of hand burns by developing new methods of operations.

MATERIALS AND METHODS OF RESEARCH

42 patients with cicatricial deformities of the soft tissues of the hand were operated in the department of reconstructive surgery of the multidisciplinary medical center of the Andijan region. The time from the healing of the burn wound to the operation ranged from 8 months to 12 years. Patients with fresh scars before and after surgery underwent conservative therapy in order to accelerate the "maturation" of the scar. Along with traditional methods of surgical treatment of scar deformities of the hand, the traditional method of plastic surgery with local tissues and the developed method of intraoperative balloon dermotension were used for their treatment. The patients were divided into two groups: the main group of 25 patients and the comparison group - 17.

Results and their discussions. With reserves of healthy tissues, local plastic surgery is carried out on both sides. It should be noted that local plastic surgery is not carried out in functionally active zones. Intraoperative balloon dermotension of the back of the hand was performed in 25 (59.5%) of 42 patients. The area of the scar lesion varied from 5 cm2 to 10 cm2 (on average 7.2±3.1 cm2), the Chi-squared criterion was - 7.21; P=0.006.

Surgery technique: with general or local anesthesia, the surgical field is treated with 3x antiseptic solutions of alcohol-povidone-iodine-alcohol, an incision is made between the scars and healthy soft tissues. A healthy skin-fat layer is mobilized from 0.5 to 2.5 cm in an acute and blunt way. Hemostasis. The balloon part of the Foley catheter is implanted into the resulting bed, the wound is temporarily sutured. According to the

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proposed scheme, intraoperative stretching of soft tissues is performed. Taking into account the available reserve, the scars are partially or completely excised, the resulting wound is closed with intraoperatively stretched soft tissues. The edges of the wound were sutured with subdermal and dermal double-row nodular sutures.

A clinical example. Patient L-V. born in 2018, Case history No. 231/38. The date of injury is 2019. Diagnosis: Post-burn scar deformation of the back of the hand (Fig. 1).

Operation No. 7 - Excision of the scar, plastic intraoperative balloon dermotension.

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Figure 1. Patient L-born in 2018: Post-burn scar deformation of the back of the hand. B: Forming a bed for the balloon. Q: Balloon implantation in the bloating phase. D,D: The result of plastic surgery.

Results in the postoperative period, 2 patients (8%) out of 25 had suppuration, and 1 (4%) had wound divergence. This is due to insufficient outflow of exudate, as well as the failure of the seam. In such cases, the skin sutures are removed. Then conservative treatment was carried out (dressing with Povidone-iodine ointment or Levomekol ointment), the wound healed a second time.

In the long term, after 6 months to 1.5 years, 3 (12%) of 25 patients had rough scars and postoperative scars expanded. These indicators have reduced the quality of surgical treatment both cosmetic and functional.

Comparative results of traditional and developed methods of plastic surgery of scar deformities of the hand. To evaluate the results of the study, we present a comparative analysis of traditional methods of plastic surgery for post-burn scar deformities of the hand, as well as new methods of their correction. For a convenient understanding of the material, we have grouped patients by type of surgery, as well as by localization of hand lesions. According to the types of operations, patients are divided as follows: (in the control group – local plastic surgery and in the main group – local plastic surgery using intraoperative balloon stretching of the skin.

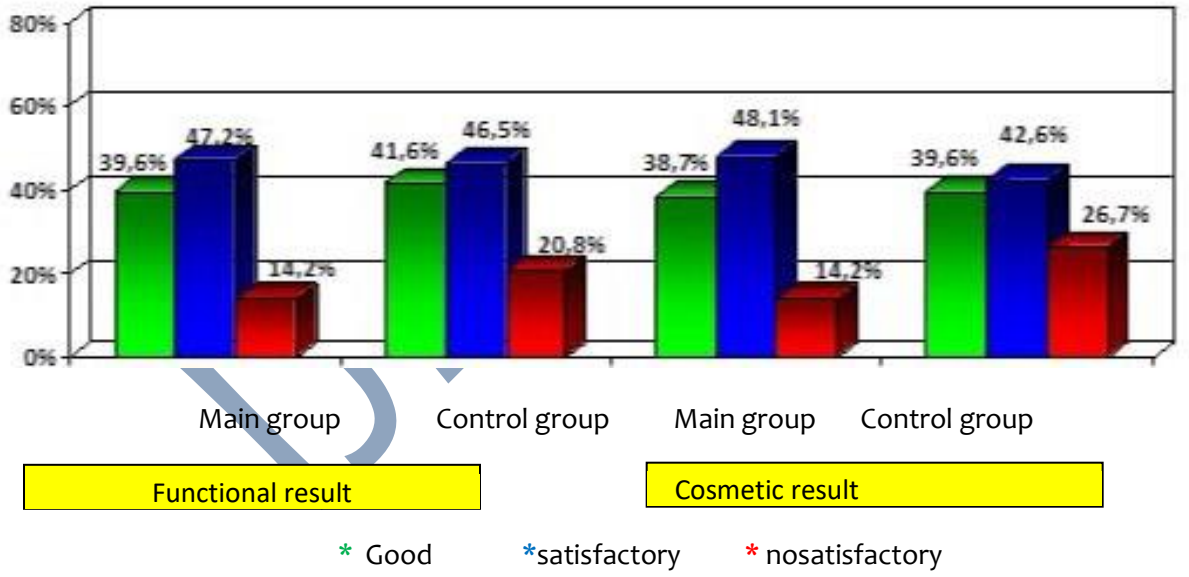

Figure 2. Comparative analysis of long-term results of plastic surgery of scar defects of the hand

A similar picture was obtained when comparing cosmetic results. Thus, the share of unsatisfactory results was 14.2% in the main group and 26.7% in the control group. The Chi-squared criterion was -8.433; P=0.049. Accordingly, the share of positive cosmetic results was 85.8% in the main group and only 73.3% in the control group.

A comparative assessment of the long-term results of plastic scar deformities of the consequences of hand

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burns is presented in Fig. 3. Unsatisfactory functional results were 17.4% versus cosmetic 20.3%. These differences were highly reliable according to the Chi-square criterion – P= 0.001.

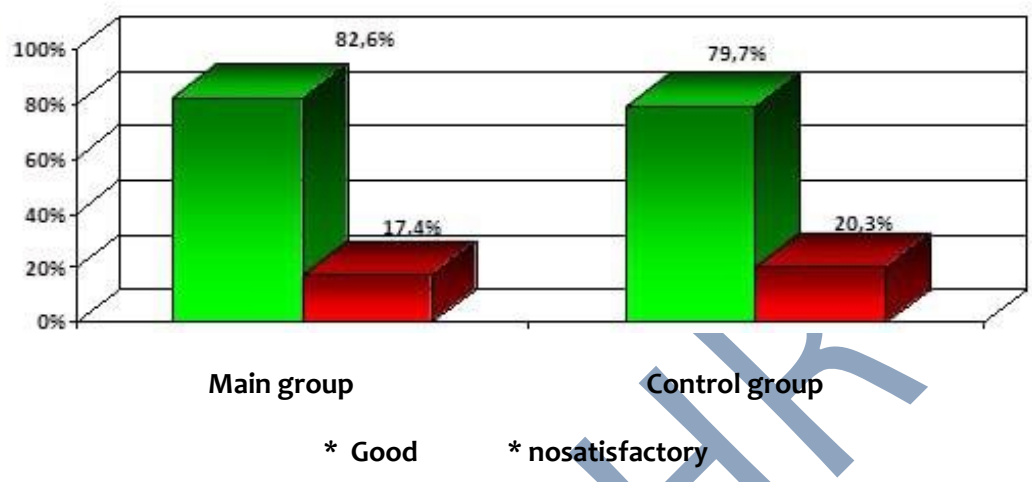

Figure 3. Summary analysis of long-term results of plastic surgery of scar deformities of the consequences of hand burns.

These differences turned out to be highly reliable according to the Chi-square criterion - P= 0.001.

CONCLUSION

Thus, the closest negative result of local plastic surgery is the divergence of the sutures due to insufficient tissue supply in healthy skin-fat flaps, and in the long term - the expansion of the scar. The above data gave impetus to the development of a new method of plastic surgery to eliminate small scar deformities of the hand with the help of intraoperative balloon stretching of healthy nearby tissues, which in the near and long term after surgery gives high treatment efficiency. In the main group, 85.8% of good results in the near term, and in the control group 73.3% and in the long term 82.6% versus 79.7% in the control group, good and satisfactory results of both functional and cosmetic nature.

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