

SURGICAL TREATMENT OF DEEP BURNS

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SUMMARY. The results are presented of the treatment of 168 patients aged 1 to 60 yr with deep burns. The use of active surgical tactics in patients with deep and extensive burns was tested. It was found that the application of a method of active surgical tactics, in combination with different approaches of wound covering such as "combined auto- and allografting", "combined auto- and porcine-skin grafting", and "combined autografting with cultivated allofibroblast cell culture usage", reduced purulent-septic complications and improved the results of treatment.

Introduction

Thermal trauma remains one of the real problems of modern medicine because of its heavy clinical course, the difficulties of treating the victims, the high mortality rate, and the sometimes unacceptable results of treatment. For this reason the problem of burns treatment draws the increasing attention of medical specialists and social security agencies. According to the World Health Organization, one person per thousand per day in the world suffers a thermal trauma. According to Russian experts, burn trauma is the third most frequent trauma of all traumas suffered by the population.

The conservative treatment of burn wounds has ceased to satisfy experts for various reasons, such as the long period of spontaneous seizure of necrotic tissues, the practically inevitable probability of the development of purulent-septic complications, the extreme shortage of donor sites, the great loss of plasma through the wound surface, etc.

Significant successes in the treatment of thermal defects became possible thanks to active surgical tactics in the treatment of severe burns.

Early escharectomy in deep burns with the subsequent closure of the wound defect plays a key role in the modern treatment of burns and is the basic approach to prevent purulent infection.

Meanwhile, certain aspects of active surgical tactics such as extension and volume, the terms and techniques of necrotic tissue excision, and ways of covering wound surfaces are still under discussion.

Unfortunately, the possibilities of performing early primary escharectomy in a wide area and one-stage autografting are limited because of the shortage of skin donor resources and the impossibility of adequate replacement of intrasurgical bleeding, the volume of which ranges between 40 and 60 ml per 1% of excised body surface. Postponed

skin grafting is more sparing but it increases the risk of the development of infectious complications, causes the patients exhaustion, and significantly extends the duration of treatment. One solution to these problems is the wide use of combined grafting methods involving auto-, allo-, and xenografts and cultivated allofibroblasts.

The purpose of the current investigation was to improve the results of burns treatment by using active surgical tactics.¹⁻²⁵

Materials and methods

The results are presented of early escharectomy (i.e. within 5-7 days of the trauma) with radical excision of affected tissues performed in 168 patients treated in the burns department of the Republican Research Centre of Emergency Medicine in Uzbekistan. The patients' ages varied from 1 to 60 yr. The total body surface area (TBSA) burned ranged between 15 and 85%, with a deep burn surface area of 5-30% TBSA.

Single-stage escharectomy and autoskin grafting with meshed grafts was performed in 15 patients. In 72 patients, in whom the wound bed was composed of subcutaneous fat and in cases of extensive haemorrhage, the autoskin grafting was postponed for 1-5 days. In 29 patients porcine skin was used as a temporary wound coverage because of the extensive burn surface and the lack of a donor site. In 27 patients we used autografts meshed 1:3 with cultivated allofibroblasts. In 25 patients with extensive burn wounds and no donor resources we performed combined auto- and alloskin grafting.

The indications for early escharectomy were as follows: localization of deep burns on the extremities and the absence of purulent processes in the wound and surrounding tissues.

Contraindications were: extremely grave condition of the patient, extreme systemic (cardiac, renal, pulmonary,

etc.) insufficiency, purulent-septic complications of the burn, and colliquative necrosis of the burn wound.

Escharectomy was performed with a Bertold electro-surgical knife. The area of the one-stage excised surface was 500-1500 cm².

Results and discussion

In 15 patients among the general number of victims with a deep burn surface area of 5-8% we performed fascial escharectomy with simultaneous closing of the defect with meshed-skin autografts. Satisfactory graft take was achieved in all 15 cases, which shows the expediency of the wide use of this approach in limited deep burns.

In 29 patients there was a shortage of donor resources, for which reason a combination of auto- and xenografts (porcine) was used. No purulent-septic complications occurred in this group of patients. In 25 of these patients, the primary grafting of porcine graft of pink coloration with capillary intergrowth was performed. Lysis of the porcine grafts and denudation of well-developed granulation tissue ideally acceptable for autografting were observed 10-12 days post-graft.

The primary use of porcine skin graft made it possible to reduce wound discharge and considerably improve the quality of the granulation tissues, which led to an improvement in the results of autografting. In one case only, partial lysis of the autoskin graft required fixing.

In 27 patients with extensive deep burns a combination was used of autoskin grafting with the transplantation of cultivated allofibroblasts. The maximum surface covered with a matrix of cellular culture was 800 cm². Cuticularization of the graft meshes (mesh ratio, 1:3) and the inter-flap fields was completed within 6-7 days of the op-

eration. Allofibroblast transplantation in patients with deep burns not only improved graft outcome and accelerated healing of the mesh but also made it possible to use a higher mesh ratio, which considerably increased the rationality of autograft usage and decreased the need of donor surfaces.

In 25 patients with extensive deep burns and a significant deficiency of donor resources, a combination of auto- and alloskin grafting was used. The skin donors were close relatives. Obligatory components of the pre-operative donor testing were the examination of ABO blood and rhesus compatibility, as well as negative results of the Wasserman, HBsAg, and HIV-infection tests. The maximum area of donor skin did not exceed 1200 cm². This approach made it possible to conduct multiple-stage autografting in favourable local conditions without the development of local purulent complications.

Conclusions

1. The prospects of improved results in the surgical treatment of deep extensive burns were associated with the wide application of active surgical tactics in the overall treatment of burn patients.

2. The method of active surgical tactics with one-stage or postponed autografting with the application of temporary wound coverage made it possible to considerably decrease the frequency of purulent-septic complications and reduce the duration of hospital stay.

3. The application of combined auto- and alloskin grafting, the use of cultivated allofibroblasts in patients with extensive deep burns, and the shortage of donor resources reduced the duration of skin restoration and promoted a favourable outcome.

RÉSUMÉ. Les Auteurs présentent les résultats du traitement de 168 patients âgés d'un jusqu'à 60 ans atteints de brûlures profondes. Après avoir testé l'utilisation d'une tactique chirurgicale active chez des grands brûlés atteints de lésions profondes et étendues, ils ont pu démontrer que l'application d'une méthode qui utilisait une tactique chirurgicale associée à des approches différentes pour ce qui concerne la couverture des lésions, comme par exemple «les autogreffes et les allogreffes associées», «les autogreffes et les greffes de peau porcine associées» et «les autogreffes associées à l'emploi de cultures de cellules cultivées d'allofibroblastes», a permis la diminution de la fréquence des complications purulentes et septiques et l'amélioration des résultats du traitement.

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