

Assessment of the efficiency of the local application of hemostatic drug Geprocel in the treatment of patients with deep burns

Yunusov O.T., Sadikov R.A., Tagaev K.R., Hakimov E.A., Shakirov B.M

Samarkand State Medical Institute, Burn department of RSCUMA, Samarkand, Uzbekistan

Abstract

Introduction: Significant successes in the treatment of deep burns became possible thanks to active surgical tactics in the treatment of severe burns. **Material and Methods:** The work is based on the analysis of the treatment results of 35 patients with burn trauma (10 women and 25 men) aged 15 to 55 years who were treated in the burn department of Republican Scientific Centre of Urgent Medical Aid (RSCUMA) between 2017 and 2018. **Results:** In this study, we report on the use of the hemostatic preparation Geprocel with an autodermoplasty on a wound after necroectomy with subsequent autodermoplasty in all cases contributed to the complete healing of donor sites for 7 days, and the complete engraftment of the skin autotransplant with full recovery of the defect by 12 days after surgery. **Conclusions:** This preliminary data suggests the potential role of Geprocel in the clinical management of burn treatment.

Keywords: Burn trauma; Haemostatic medications; Geprocel; Intravascular coagulation syndrome; surgical treatments.

Introduction

Burns are serious, complex injuries that frequently lead to disability and death. Consequently, their diagnosis and treatment requires a special approach [1, 2]. According to the American Burn Association, 450,000 people receive medical attention for burn wounds, with 40,000 requiring hospitalization and 3,400 deaths attributed to burn wounds [3].

Significant successes in the treatment of deep burns became possible thanks to active surgical tactics in the treatment of severe burns [4-6].

The essence of the operative treatment of deep burns lies in one way or another to compensate for the defect of the skin, resulting from their necrosis. The most common method of restoring the integrity of the skin is free plastic skin. Plastic closure of a burn wound is preceded by its preparation, which consists in cleansing the wound from necrotic tissues and forming a bed conducive to engraftment. The preparation of burn wounds for autodermoplasty can be carried out at different times, using different methods, characterized by greater or lesser "aggressiveness". In all cases, the final stage is the closure of the wound surface [7, 8].

The aim of the work is to improve the results of early necroectomy with autodermoplasty in burned patients with the use of local hemostatic drug "Geprocel".

Materials

The work is based on the analysis of the treatment results of 35 patients with burn trauma (10 women and 25 men) aged 15 to 55 years who were treated in the burn department of Republican Scientific Centre of Urgent

Medical Aid (RSCUMA) between 2017 and 2018.

The causes of the burns were as follows: flame - 21 cases; scalds – 8 cases; and contact burns 6 cases.

The total area of the lesion in patients ranged from 5 to 20% of the body surface, and a deep burn of III B – IV degree to 10%.

All patients underwent early necroectomy to healthy tissues with the appearance of capillary hemorrhage with simultaneous autodermoplasty. Hemostasis was carried out with hemostatic powder from cellulose derivatives with the preparation Geprocel 10 mg of powder once a day for 3 days.

Methods and Results

The clinical evaluation included the following criteria: the number and nature of the discharge; bleeding of wounds; timing of epithelialization of donor sites, transplanted autodermotransplants; full epithelialization; severity of wound pain.

Surgical intervention for 35 patients with deep burns consisted in the use of the hemostatic preparation Geprocel to stop bleeding after excision of necrotic skin and subcutaneous structures.

Our researches have shown that early surgical necroectomy and the taking of split autotransplants from donor sites is accompanied by blood loss (6-10 ml of blood over an area of 100 cm²), and immediately after the application of the hemostatic Geprocel powder, the bleeding completely stops and the wound surface takes on a brilliant appearance due to the adhered to her film. Pain was insignificant. When the wound defect was closed by donor autografts, good adhesion of the skin graft to the underlying wound was noted.

When viewed on the next day, signs of skin graft necrosis were not observed. The donor's wound is also clean; there are no signs of infection or pain.



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Correspondence: Shakirov, Samarkand State Medical Institute, Burn department of RSCUMA, Samarkand, Uzbekistan. Email: baburshakirov@yahoo.com.



On the 3rd day after the operation, the patients had a positive dynamics of skin graft healing. Discharge from the wound was not observed. There are no signs of inflammation and infection in the donor site.

On the 7th day after the skin transplantation there is an almost complete engraftment of the skin graft, the suture line in the form of a clear thin line, with no signs of reddening or infiltration. The skin graft is soft, elastic, pale pink. Signs of infection are not marked. The donor site was completely epithelized, there remained a thin elastic scar without signs of hypertrophy and inflammation, painless.

On the 12th day, complete autotransplant of the skin took place, with complete restoration of the defect with a slight contraction of the defect area.

Thus, in patients, the use of the film form of the hemostatic drug "Geprocel" after necrectomy with subsequent autodermoplasty in all cases contributed to the complete healing of donor sites for 7 days, and the complete engraftment of the skin autotransplant with full recovery of the defect by 12 days after surgery (Table 1).

Table 1. Comparative analysis of the present and future treatment results of patients with different kinds of burns

№	Results	Group I (n=21)	Group II (n=17)
1.	Bleeding during the operating	20-30 ml	130-150ml
2.	Operation term	4.72±0.4*	4.72±0.4*
3.	Wound complications	0	3 (16.6%)
4.	Bed days	10.0 9 ± 3.2	16.0 9 ± 3.2
5.	Complication un follow up post operative period	3 (14.3%)	4 (23.5%)

Note: * – P<0,05on comparison

Discussion

Thermal damages are a serious medical, social and economic problem. With the development of heavy industry and the chemical industry, as well as the widespread use of electrical energy in everyday life and industry contribute to a significant increase in burn injuries.

Historically, there are two main areas of surgical treatment of burned ones: 1) autodermoplasty of granulating post-burn wounds after spontaneous rejection of necrotic tissue or chemical necrectomy; 2) early surgical necrectomy before the development of inflammation in the wound with subsequent autodermoplasty [9-11].

Independent rejection of dead tissue with deep burns leads to a complete cleansing of the wound surface after 4-6 weeks. The long existence of burn scab prevents the implementation of autodermoplastic, contributes to the development of pyogenic microflora in the burn wound and the release of toxic substances.

In this regard, it is clear the desire of doctors to accelerate the rejection of necrotic tissue, suppress purulent infection in the wound and reduce the time of preoperative preparation for skin grafting.

Due to early surgical treatment (removal of a burn scab in the first 3-7 days after injury with simultaneous or delayed autodermoplasty), there are opportunities to change the course of the burn disease and interrupt its course. The time taken to prepare burn wounds for autodermoplasty, the time to restore the integrity of the skin, the duration of inpatient treatment, the number of infectious complications and deaths are reduced.

But early surgical necrectomy is quite a traumatic operation, and may be accompanied by abundant blood loss. According Musgrave M (2000) blood loss was at least 250-300 ml with a wound surface of 10% According to other data, with early excision of dead tissue in an area of 100 cm² leads to a loss of 76 ml of blood, and the removal of granulations in the same area – 64 ml [12].

It should also be taken into account that the operation of autodermoplasty provides for the formation of extensive "donor" wound surfaces, often equal in area to burns. Given the operational risk associated with blood loss and pain impulses, an increase in the area of lost skin puts this type of surgery in a special place [13-14].

Therefore, local hemostatic therapy adequately carried out during the operation can prevent blood loss, thereby improving the results of treatment of this cohort of patients.

Conclusions

- 1) Use of the drug Geprocel during autodermoplasty after early necrectomy provides complete hemostasis and a reduction in the severity of wound pain.
- 2) Local single application of the hemostatic preparation Gepotsel after an autodermoplasty to a wound after necrectomy contributes to the rapid adhesion of the graft ensures a swift and complete engraftment of skin grafts.

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