Therapeutic management for patients with trunk and extremities integumentary tissues defects of traumatic genesis

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Objective: To improve the results of treating patients with wounds, functional and aesthetic defects of mechanical origin by developing a comprehensive program of surgery to restore the form and function of trunk and limbs.

Materials and methods. The criteria for the inclusion into the study: both genders patients aged over 17 years with diagnosed skin and adjacent soft tissues of trunk and limbs defect that needed restoration of body form and functions. We have operated 231 patients with integumentary tissue defects of a mechanical origin in the clinic. There were 129 men, 102 women of them. The patients’ age ranged from 17 to 76 years.

Results. All the patients were divided into 4 groups depending on the size, depth and the extent of damage of soft tissues and other structures of the body and limbs. I group – 79 (34.2 %) patients with isolated soft tissues damage (to the fascia): 32 (13.85 %). II group – 67 (29 %) patients with injuries of integumentary tissues of a moderate severity whose vital activity was disturbed in a limited area with parawound zone (lower from fascia). III group – 48 (20.8 %) patients (tissues damage to a significant extent). IV Group – 37 (16 %) patients, whose trauma was accompanied by injury of a vascular-neural fascicle, partial or complete extremity abjunction.

Conclusions. 1. The choice of corrective surgical intervention method and the closure of the integumentary tissue defect depended on the size, the depth of the wound and hemodynamic characteristics of the damaged area. 2. The new method of treating the consequences of traumatic injuries using the preparation of hyaluronic acid expanded the prospects of treating patients with integumentary tissues defects. 3. The differential approach to the choice of the method of closing the wound surfaces caused by mechanical damage made it possible to achieve satisfactory results in 97.84 % of cases.

Key words: wound, injury, tissue cover, hyaluronic acid, flap.

Pathologia 2017; 14 (1), 87–90
DOI: 10.14739/2310-1237.2017.197791
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Damage to the skin integuments with formation of large wound defects in severe trauma is often accompanied by significant blood loss, shock, development of wound infection and the possibility of skin flaps further necrosis [1]. This injury occurs predominantly in people of working ability age and is a frequent component of polytrauma – from 21.4 to 48.9 % [4].

One of the most serious consequences of injury is a disability. According to the WHO in the world there are more than 500 million people with disabilities. In this the cause of disability in young patients with injuries only in 25–30 % of cases is the severity of the injury itself, in 30–70 % of cases they are the inadequacies of diagnosis, treatment and medical care organization [2,5].

Treatment of polytrauma is associated with solving three major problems: the restoration of vital functions, prevention and treatment of various complications due to traumatic illness, the earliest mobilization of a patient for the restoration of all organs and systems’ activities.

Objective: To improve the results of wounds treatment, functional and aesthetic defects of mechanical origin by developing a comprehensive program of surgery to restore the form and function of trunk and limbs.

Materials and methods

The criteria for the inclusion into the study: both genders patients aged over 17 years with diagnosed skin and adjacent soft tissues of trunk and limbs defect that needed restoration of body form and functions.

We have operated 231 patients with integumentary tissue defects of a mechanical origin. There were 129 men, 102 women of them. The patients’ age ranged from 17 to 76 years.

Results

All the patients were divided into 4 groups depending on the size, depth and the extent of damage of soft tissues and other structures of the body and limbs.

I group – 79 (34.2 %) patients with isolated soft tissues damage (to the fascia), of which in 32 (13.85 %) cases autoplasty with the split-skin graft was performed; in 9 (3.9 %) cases xenoplasty in urgent procedure followed by the closure of the wound with the split auto graft was performed; in 15 (6.49 %) cases autoplasty by Ollier–Thiersch was used; in 11 (4.76 %) patients local flaps grafting was performed, in 2 (0.87 %) cases of deferred term dermatension methods were used to close the defect; in 10 (4.33 %) patients the new method of wound treatment, developed in the clinic was used.

The basis of the new method of treating prolonged existing wound defects in the lower extremities was using a combined preparation of hyaluronic acid with sodium salt of succinic acid, which will improve the effectiveness of treating this category of patients [3].

The preparation of hyaluronic acid with sodium salt of succinic acid was used; in 11 (4.76 %) patients local flaps grafting was performed, in 2 (0.87 %) cases of deferred term dermatension methods were used to close the defect; in 10 (4.33 %) patients the new method of wound treatment, developed in the clinic was used.

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prolonged existing venous ulcers of vascular etiology in combination with surgical interventions.


Hospitalization date: 02.04.2012.

Discharge date: 13.04.2012.

On admission to the hospital the patient complained of a prolonged existing wound defect in the left foot.

Medical History of the disease: The patient had been feeling sick for 4 years, when in the road-traffic accident he had been injured after falling under the train – an open fracture of the left ankle joint, extra large wound defect of the left foot. After a prolonged course of treatment the wound on the outer edge of the foot remained, which hadn’t been healing for 3 years.

When examined locally the left foot was deformed in the area of ankle joint, on the outer surface of the foot wound defect was determined up to 3 cm in diameter with irregular edges, flabby granulation and fibrin coating.

Since 04.04.12 monotherapy course of 1.5% hyaluronic acid solution injection started. Under conditions of a dressing room the patient’s wound defect area was debrided with antiseptic solution. The size of the defect was measured with the centimeter tape before the treatment. We utilized completely ready for use glass syringe Luer – lock having been filled beforehand and an additional needle with the solution of not structured hyaluronic acid with succinate (concentration of hyaluronic acid 15 mg/ml).

Departing from the edge of the ulcer 0.2 cm the single solution of 0.1–0.2 mL was injected intracutaneously by a tunnel technique. The gaps between injections were 0.2 cm. The sterile gauze bandage was applied on the wound defect. The procedure was repeated 2 times a week with compulsory metering of the wound defect and its photographing. The course of treatment lasted for 2 weeks, including 1 week as an outpatient.

After the treatment complete epithelialization of the wound defect was observed.

Group II – 67 (29 %) patients with injuries of integumentary tissues of a moderate severity whose vital activity was disturbed in a limited area with parawound zone (lower from fascia). Xenoplasty followed with further autoplasty by a split-skin graft was performed in 5 (2.16 %) patients, in 32 (13.85 %) cases plasty by a split-skin graft was performed, in 7 (3.03 %) – autografting by Ollier-Thiersch, in 16 (6.92 %) patients local flaps grafting was made.

Group III – 48 (20.8 %) patients (tissues damage to a significant extent). In 42 (18.18 %) patients plasty by rotation cellulocutaneous flap in the axial blood supply was performed, 3 (1.3 %) cases – wound defect closure by sural flap, in 1 (0.43 %) case closure of amputation defect by sural flap, in 1 (0.43 %) case closure of amputation was performed, 3 (1.3 %) cases – wound defect closure by a skin graft, in 1 (0.43 %) case closure of amputation was performed, in 4 (1.73 %) of cases combined plasty by a split autograft rotation flap was performed.

Group IV – 37 (16 %) patients, whose trauma was accompanied by injury of a vascular-neural fascicle, partial or complete extremity abjunction, in 4 (1.73 %) – prosthetics of popliteal artery, decompessive fasciotomy of the shin, followed by a further autoplasty of a wound defect by a split-skin graft; plasty by a musculocutaneous flap of the widest muscle of the back on the vascular pedicle in 1 (0.43 %) case; prosthetics of femoral artery, decompessive fasciotomy, secondary suturing – 2 (0.87 %) cases; revision of the popliteal artery with periarterial sympathectomy and plasty of the defect by a sural flap in 1 (0.43 %) case. In 12 (5.19 %) patients – suture of the posterior tibial artery, in 2 (0.87 %) cases – decompessive fasciotomy followed by a further secondary suturing, in 5 (2.16 %) cases – dorsal artery of foot ligation. In 10 (4.33 %) patients ulnar artery suture was performed, in 3 (1.3 %) – radial artery ligation, wound defects were closed in 7 (3.03 %) cases using split autografts, in 3 (1.3 %) cases local flaps grafting was performed.

Conclusions

1. The choice of corrective surgical intervention method and the closure of the integumentary tissue defect depended on the size, the depth of the wound and hemo-dynamic characteristics of the damaged area.

2. The new method of treating the consequences of traumatic injuries using the preparation of hyaluronic acid expanded the prospects of treating patients with integumentary issues defects.

3. The differential approach to the choice of the method of closing the wound surfaces caused by mechanical damage made it possible to achieve satisfactory results in 97.84 % of cases.

References


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Конфлікт інтересів: відсутній.
Conflicts of Interest: authors have no conflict of interest to declare.