

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.

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Лікувальна тактика у хворих із дефектами покривних тканин тулуба та кінцівок травматичного генезу

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Мета роботи – поліпшити результати лікування хворих із ранами, функціональними та естетичними дефектами механічного генезу шляхом розробки комплексної програми хірургічного лікування для відновлення форми та функції тулуба й кінцівок.

Матеріали та методи. Критерії включення в дослідження: хворі віком понад 17 років обох статей із встановленим діагнозом дефект шкіри та підлеглих м'яких тканин тулуба, кінцівок, які потребували відновлення форми та функції тіла. У клініці прооперований 231 пацієнт із дефектами покривних тканин механічного генезу. З них чоловіків – 129, жінок – 102. Вік хворих коливався від 17 до 76 років.

Результати. Усіх хворих поділили на 4 групи залежно від розмірів, глибини та ступеня пошкодження м'яких тканин та інших структур тулуба й кінцівок. I група – 79 (34,2%) хворих з ізольованим пошкодженням м'яких тканин (до фасції): 32 (13,85%). II група – 67 (29%) хворих із пошкодженнями покривних тканин середньої важкості, життєдіяльність яких порушена на обмеженій ділянці з парарановою зоною забою (нижче фасції). III група – 48 (20,8%) хворих (пошкодження тканин на значному протязі). IV група – 37 (16%) хворі, в яких травма супроводжувалася ураженням судинно-нервового пучка, частковим або повним відчленуванням кінцівки.

Висновки. Вибір методу корегуючого втручання та закриття дефекту покривних тканин залежав від розміру, глибини рани, гемодинамічних особливостей ділянки пошкодження. Новий метод лікування наслідків травматичних ушкоджень із використанням препарату гіалуронової кислоти розширив перспективи лікування пацієнтів із дефектами покривних тканин. Диференційний підхід до вибору методу закриття ранових поверхонь, що зумовлені механічними пошкодженнями, дав змогу досягнути задовільних результатів у 97,84% випадків.

Ключові слова:

рана, травма, покривні тканини, гіалуронова кислота, клапоть.

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Лечебная тактика у больных с дефектами покровных тканей туловища и конечностей травматического генеза

Е. В. Пономаренко

Цель работы – улучшить результаты лечения больных с ранами, функциональными и эстетическими дефектами механического генеза путём разработки комплексной программы хирургического лечения для восстановления формы и функций тела и конечностей.

Материалы и методы. Критерии включения в исследование: больные старше 17 лет обоих полов с установленным диагнозом дефект кожи и подчинённых мягких тканей туловища и конечностей, которые нуждались в восстановлении

Ключевые слова:

рана, травма, покровные ткани, гиалуроновая кислота, лоскут.

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формы и функций тела. В клинике был прооперирован 231 пациент с дефектами покровных тканей механического генеза. Из них мужчин – 129, женщин – 102. Возраст больных колебался от 17 до 76 лет.

Результаты. Все больные были разделены на 4 группы в зависимости от размеров, глубины и степени повреждения мягких тканей и других структур туловища и конечностей. I группа – 79 (34,2 %) больных с изолированным повреждением мягких тканей (до фасции): 32 (13,85 %). II группа – 67 (29 %) больных с повреждениями покровных тканей средней тяжести, жизнедеятельность которых нарушена на ограниченном участке с парараневой зоной повреждения (ниже фасции). III группа – 48 (20,8 %) больных (повреждение тканей на значительном протяжении). IV группа – 37 (16 %) больных, у которых травма сопровождалась поражением сосудисто-нервного пучка, частичным или полным отчленением конечности.

Выводы. Выбор метода корректирующего вмешательства и закрытия дефекта покровных тканей зависел от размера, глубины раны и гемодинамических особенностей участка повреждения. Новый метод лечения последствий травматических повреждений с использованием препарата гиалуроновой кислоты расширил перспективы лечения пациентов с дефектами покровных тканей. Дифференцированный подход к выбору метода закрытия раневых поверхностей, которые обусловлены механическими повреждениями, позволил достичь удовлетворительных результатов в 97,84 % случаев.

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 by intracutaneous injecting 1.0 ml of 1.5 % solution around the ulcer defect once a week for 5–7 weeks. During treatment the dynamic measurements of trophic ulcer defect were carried out.

All the patients having been treated by this method were discharged with a positive result – namely, complete healing of trophic ulcer.

The introduction of hyaluronic acid preparations into extracellular matrix ensures to provide the section of surgery with the additional amount of hyaluronic acid to optimize the performance of its biological functions in the skin, such as: increased turgor and plasticity of tissues, stimulated processes of elastogenesis, collagenogenesis and angiogenesis. Sodium succinate (sodium salt of succinic acid) operates at the level of mitochondria – to activate the processes of cellular respiration, synthesis of ATP and structural proteins of the skin.

This method of treatment can be used not only in hospitals but also in the outpatient setting, which significantly reduces treatment time and patient's stay in the hospital.

Despite the fact that redermalization is a technique that requires special training, its further use doesn't require specific tools, support of anesthesia or operating room. Conducting weekly measurements of ulcer defect permits to evaluate ulcer treatment results in dynamics and is able to adjust the treatment that does not require special tools, other than centimeter tape or tracing paper.

Thus, the totality of the above positive effects enhanced the effectiveness of treatment, accelerated the patients' recovery, reduced the number of complications and reduced bed days.

Besides the fact that the use of this method does not require special facilities and attracting specialists of different profile, it can be used in outpatient regime to treat

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

Example. Patient D., 1995. Medical history number 5204 was admitted to the Department of Thermal Injuries and Plastic Surgery with the Diagnosis of posttraumatic wound defect of the left foot. Accident (2008). Chronic glomerulonephritis.

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%) of cases plasty by a split-skin autograft was performed, in 7 (3.03%) – autografting by Ollier-Thiersch, in 16 (6.92%) patients local flaps grafting was made, 3 (1.3%) – free flap surgery, in 4 (1.73%) of cases combined plasty by a split autograft rotation flap was performed.

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 stump of the upper extremity by a musculocutaneous flap was performed, in 2 (0.87%) cases the method of dermatension was used.

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, decompressive 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, decompressive 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 – decompressive 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 made.

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.

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