

5th International Conference on Wound Care, Tissue Repair and Regenerative Medicine

April 15-16, 2022 | Paris, France

Received date: 18-01-2022 | Accepted date: 05-02-2022 | Published date: 15-04-2022

Local conservative treatment of burn wounds using biomaterials

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The development and improvement of tools that contribute to the optimization of wound healing processes remains an urgent task to date, despite the significant successes achieved by medical science. We have successfully (97 observations) used the wound coating "Chitopran", developed with the participation of specialists of our center, in the treatment of burns of II – III A degree. The coating was also used in the treatment of wounds of donor sites, long-term non-healing wounds, trophic ulcers, bedsores. The coating is characterized by improved absorption of wound discharge, atraumatic, comfortable to wear and provides an effective wound healing effect, has biocompatibility, biodegradation property. The use of biopolymer material allows to reduce the frequency of dressings, make the treatment process less painful, reduce the time of hospitalization of patients and prevent the formation of rough scars.

In our clinic, a study of the effectiveness of the use of Pantolen gel. The gel includes as an active ingredient an aqueous extract from the antlers of the Altai maral, contains a unique balanced complex of biologically active substances, including proteins, peptides, glycosaminoglycans, glycolipids, trace elements, vitamins, does not contain synthetic additives. The gel was used in 15 patients in the treatment of II-III-degree burns, and in 3 patients in the treatment of long-term non-healing wounds. Observations allowed us to state that Pantolene gel has a pronounced stimulating effect on the processes of tissue regeneration, activates marginal and insular epithelization, shortens the healing time, is convenient to use in open wound management, in particular of the face, neck, and perineum.

The arsenal of remedies for the treatment of superficial and "transitional" forms of burns, residual long-term non-healing wounds, trophic ulcers, bedsores also included a hydrogel based on the cationic salt of the chitosan biopolymer and ascorbic acid. The gel was used in the treatment of 27 patients.

It has a high antibacterial activity on gram-positive and gram-negative strains, comparable to the effect of chlorhexidine bigluconate, is convenient for application to extensive wound surfaces, does not prevent the outflow of wound discharge into the dressing, activates the processes of wound regeneration.

The use of the developed biomaterials in surgical practice makes it possible to reduce the time of hospitalization and improve the results of treatment of wounds of various etiologies.

Recent publications

1. Ambrosio L. The role of biomaterials in burn treatment. *Burns Trauma*. 2014;2(4):150-152. Published 2014 Oct 25.
2. Budkevich LI, Mirzoyan GV, Gabitov RB, et al. Collost Bioplastic Collagen Material for the Treatment of Burns. *Sovrem Tekhnologii Med*. 2020;12(1):92-96.
3. Lukomskiy, A O, Rao N, Yan L. et al. Stem Cell-Based Tissue Engineering for the Treatment of Burn Wounds: A Systematic Review of Pre-clinical Studies. *Stem Cell Rev and Rep* (2022).

Speaker Biography

N V Ostrovsky graduated with honours from Saratov Medical Institute. Since 2003 to the present, he has been chief executive officer of the Regional Clinical Center of Combustiology. He is also professor of the operational surgery department and heads the Department of Cell Engineering, Nanostructures, and Biosystems of the Saratov State University. Professor Ostrovsky is deputy chairman of the task group "Thermal Injury" of the Scientific Council on Surgery of the Ministry of Health and Social Development of the Russian Federation, RAMS; he is a member of the Russian and International Society of Plastic, Reconstructive and Aesthetic Surgeons and Pirogov Surgical Society. He published more than 240 peer-reviewed research papers and registered 14 patents and co-authored 5 monographs. He is on editorial boards of 4 journals. Currently N.V. Ostrovsky is the head of the surgical scientific school, which is carrying out pioneering research on the problem of surgical treatment of burns.

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