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Reparation of experimental deep wound, treated with platelet-filled dermal matrix

Natalya Valerievna Borovkova, Andreev Yu V, Makarov M S, Ponomarev I N, Storzheva M V, Budaev A A and Officerov A A

N.V. Sklifosovsky Research Institute for Emergency Medicine, Russia

A deep burn model was performed in white mice by skin excision to fascia, the area of wound defect was 2% of body surface. Wound coating based on decellularized dermal matrix (DM). We used DM without platelets (control) and DM, containing platelets with granules (high quality platelets). After 3 days all animals had hyperemia and extensive scab, epithelium and dermal layer were completely absent. The wound bottom and underlying tissues were strongly infiltrated by inflammatory cells- in the control group the infiltration density was 266 ± 48 cells/mm², in the experiment- 230 ± 35 cells/mm² ($p<0,05$). In experimental animals macrophages and fibroblasts intensively migrated to the edges of the wound, what did not occur in control. After 14 days granulation tissue formed along the entire bottom of wound. The density of newly formed vessels in control was 171 ± 33 , in the experimental groups – 504 ± 27 ($p<0,05$), i.e., angiogenesis and cell proliferation significantly increased. Nevertheless, the infiltration density did not differ from 3 days ($p>0,05$). After 21 days in control group the wound area remained the scab, tightly soldered to the wound bottom, associated with high level of inflammatory cells, epithelial growth was local. In experimental group all animals had no scab on most of the wound area, followed by active epithelium growth and hair follicles formation. Thus, wound coatings, based on DM with platelets, stimulated cell migration and proliferation in the wound, reduced the degree of infiltration

by inflammatory cells, stimulated active growth of the marginal epithelium and maturation of granulation tissue.


Recent publications

1. A Y Vaza, A M Fain, N V Borovkova, et al. The First Experience of Using the Developed Modified Allogenic Bone Grafts in the Surgical Treatment of Patients With Severe Fractures of the Surgical Neck of the Humerus. Russian Sklifosovsky Journal "Emergency Medical Care" Vol 10, No 1 (2021) P.83-90.
2. AA Budaev, MS Makarov, VV Slastinin, NV Borovkova. Materials used for knee ligament grafting. Transplantologiya. The Russian Journal of Transplantation/ Vol 13, No 3 (2021) P. 280-292.
3. N V Borovkova, M S Makarov, I N Ponomarev, Yu V Andreev, A. S. Mironov. Tissue banks. World experience. The history of development and current approaches. Transplantologiya. The Russian Journal of Transplantation/ Vol 13, No 1 (2021) P. 49-62.

Speaker Biography

Natalya Valerievna Borovkova has completed her MD at the age of 43 years from N.V. Sklifosovsky Research Institute for Emergency Medicine, Moscow, Russia. She graduated from the Moscow Medical Academy I.M. Sechenov with a degree in General Medicine. In 2010 N.V. Borovkova was the head of the scientific laboratory of cell transplantation and immunotyping. In 2018 she has been the head of the scientific department of biotechnology and transfusiology. N.V. Borovkova is the author of more than 240 publications, 26 RF patents for inventions (Hirsch Index RSCI - 7, SCOPUS - 3, Web of Science - 2).

e: BorovkovaNV@sklif.mos.ru

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