

Biological bases of tissues regeneration stimulated by the Alloplant™ allogeneic biomaterials

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At present to restore tissues there is used mainly the orthotopic principle of grafting. Experimental and clinical investigations, performed in our Centre, showed that the heterotopic principle of grafting allows considerably widening the sources of tissues harvesting and ranging of their usage in restorative surgery. But this principle requires an empirical approach submission the tissue grafting selection for the system of criteria with qualitative and quantitative parameters. These criteria could be: 1) tissue immunogenicity, 2) tissue fibroarchitectonics and physical-mechanical properties, 3) prevalence of this or that kind of proteoglycans in collagen fiber composition. Low tissue immunogenicity is achieved thanks to the membranolysis and cell elimination as well as extraction of the proteoglycans protein portion which allows to reduce the immune reaction with the lymphocytes involvement. The tissue selection according to fibroarchitectonics allows to prevent scarring in the surgery area during the transplant resorption and regenerate formation. The selection of tissues with the predominance of this or that type of proteoglycans allows to achieve the regenerate formation of different cell composition and structure: namely, dense, loose, vascularized, epithelial etc. The studies with pulverized biomaterial showed the key role of the macrophages in resorption of the allogeneic biomaterials and formation of the newly-formed tissue. Implantation of the biomaterial induced activity a great number of the mature macrophages, which completely lysed and resorbed the biomaterial particles. Expression TNF α was significantly higher whereas expression TGF- β 1 was significantly lower. Macrophages containing large vacuoles with an active endo- and exocytosis were revealed and were named "matrix-forming macrophages". We may suppose that these macrophages synthesize (or re-synthesize) proteoglycan component of the newly-formed collagen fibers. There was put forward a hypothesis about the two component mechanism of the collagen fibers formation during tissue regeneration stimulated by the allogeneic biomaterials.

Biography

S. A. Muslimov has completed his Ph.D at the age of 36 years from Bashkir State Medicval University and doctorate degree at the age 52. He is the head of the morphological department of the Russian Eye & Plastic Surgery Center. He has published more than 40 papers in peer-reviewed journals.

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