

Using of bone marrow and fat to improve nerve regeneration after nerve injuries

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Abstract

Recovery of large nerve defects currently unresolved problem of trauma especially in case of tissue fibrosis after gunshot injuries. The 1st series of experiment was performed on 4 groups of 10 rabbits. To all of them performed 1 cm nerve defect, then nerve autoplasty with microsurgical suturing. Group 1 was control. In group 2 place suture covered with autologous adipose tissue. In Group 3 suture zone processed by concentrated bone marrow (BMAC). In group 4 zone was covered with a mixture of BMAC and adipose tissue. Histologically: after 30 days- number and density of nerve fibers was evaluated in 1 cubic mm. In the part of nerve plastic it was in the first group -1501, 0 ± 121 , 1 in the second -3029, 0 ± 206 , 8 in the third -3245, 4 ± 200 , 5 and fourth -3786, 3 ± 210 , 7 nerve fibers per 1 cubic mm (in intact nerve -9601, 0 ± 285 , 5). The 2nd series was performed with injection of BMAC in targeted muscles simultaneously with badly performed nerve reconstruction (simulation of ineffective reinnervation). According to electromyography- after 16 weeks, average number of muscle motor units in BMAC group was 9, 6 (1.5 more than in control group). Conclusion: In groups where autoplasmic was combined with biotechnology were significantly better recovery rates of nerve and muscles. Best restoration was held in the group, which combined bone marrow and adipose tissue. Clinically: In 54 patients-, nerve reconstruction was combined with fat and BMAC grafting. In 1 year, no signs of secondary fibrosis and nerve compression was in 53 cases. Injections of BMAC significantly improves muscle restoration after nerve injury.

Biography

Gaiovych completed PhD at the age of 34 (2 years ago) in Kyiv in Institute of Traumatology and Orthopedics of the National Academy of Medical Sciences of Ukraine where now currently working, as scientist of clinic of microsurgery and reconstructive surgery of the upper extremity. Currently providing research in the field of the use of cellular technologies in orthopedics and traumatology in particular for nerve injuries and muscle damage. Have 7 publications.

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