

Learning Curve in Hemifacial Transplantation in Rats

M. Climov, M.B. Măciuceanu Zarnescu, A. Ștefănescu, D. Zamfirescu, I. Lascăr

University of Medicine and Pharmacy "Carol Davila" Bucharest, Romania

Department of Plastic Surgery and Reconstructive Microsurgery General Emergency Hospital, Bucharest, Romania

Abstract

Introduction: The aim of this study was to emphasize the learning curve of hemifacial transplantation in rats by comparison between 2 operators: medical student trained in basic microsurgery and an experienced microsurgeon.

Materials and Methods: A total number of 15 hemifacial transplants between Brown Norway as donors and Wistar as receiver rats were performed by two operators: experienced microsurgeon (group II, n=5) and the medical student (group III, n=10). Warm ischemia time and operative time were used as instrument for comparison. All the rats received immunosuppressive treatment with cyclosporine A in monotherapy for 30 days. Results were processed statistically using Microsoft Excel.

Results: Transplantation procedure duration time performed by experienced microsurgeon began from 420 min and decreased to 330 min after 5 transplantations, with confidence interval (95% probability) 382 ± 37.9 min and the warm ischemia time decreased from 140 min to 50 min, confidence interval of the warm ischemia time being 90 ± 33.52 min. After transplantation the rats were treated with cyclosporine A and monitored for 30 days. Medical student tended to equalize the operative time and warm ischemia time, approximately, after 9 transplantations, from 660 min to 330 min and warm ischemia time from 190 min to 60 min. The confidence interval (95%) of the procedure by duration of the surgery was 467 ± 80.66 min and 133.5 ± 31.44 min for the warm ischemia time. Most of the rats (n=11) survived in both transplanted groups (group II and group III) performed by microsurgeon and student. By analyzing learning curves using two parameters (operative time and warm ischemia time) and survival rates no statistically significant difference was found ($p > 0.05$).

Conclusion: Hemifacial transplantation model in rats is a useful tool for preparing experimental and clinical application of the facial transplantation. It is a good model for training young specialists for future transplantation surgery. It is important to notice that the medical student had previous experience in microsurgery and the learning curve was applied only for this specific procedure. Even young specialists in microsurgery could perform such a complex procedure after an appropriate training period (in our study after 9 consecutive transplantations) in the same fashion and with the same results as an experienced microsurgeon. Usage of cyclosporine A as monotherapy gave good immunosuppression results in rats' transplantations for the studied duration of time (30 days).

Key words: facial transplantation in rats, education, learning curve, composite tissue allotransplantation, vascularized composite allograft

Corresponding author: Dragoș Zamfirescu MD, PhD

Department of Plastic Surgery and Reconstructive Microsurgery General
Emergency Hospital, Bucharest, Romania

E-mail: dragoszamfirescu@gmail.com