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A Histological and Clinical Evaluation of Plasma as a Graft Holding Solution and Its Efficacy in Terms of Hair Growth and Graft Survival

Anil Kumar Garg, MBBS, MS.MCh, FISHRS | *Indore, India* | anilgarg61@yahoo.com; Seema Garg, MBBS, MSc | Indore, India

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INTRODUCTION

The surgical trauma of hair transplantation triggers inflammation, which is the first step in wound healing. The brunt of the biochemical changes has to be borne by the newly transferred grafts, which are devoid of any blood supply. Graft survival is affected by a multitude of factors including graft harvesting, dissection, manipulation during implantation, and ischemia/reperfusion injury following implantation in the body. The insults inflicted from these unfavourable factors lead to apoptosis, which affects graft survival and the quality of hair regrowth. In order to achieve the best results, we should focus on improving all of the above mentioned factors.

Grafts harvested and maintained out of the scalp are preserved in a holding solution until they are implanted. Thus, the holding solution plays a crucial role in the hair transplant procedure. An ideal holding solution should have the same osmolality as the graft cells, should prevent acidosis, should provide energy to the cells, and should prevent the release of free radicals. There are two types of holding solutions: extracellular and intracellular. Examples of extracellular solutions are normal saline, Lactated Ringer's (LR), and plasma-like fluids. The intracellular solutions are represented by HypoThermosol®. Extracellular holding solutions do not require chilling, which causes sodium pump failure leading to swelling of the cells, whereas intracellular holding solutions do require chilling.[1]

At our center, we use autologous plasma with platelets as a graft holding solution during hair transplantation surgery. Clinical results have been evaluated with trichoscan analysis and supported by histological evaluation for graft viability. There is literature advocating the use of platelet-rich plasma (PRP) to promote hair growth, based on the logic that platelets have growth factors that stimulate the stem cells of hair follicles.[2]

OBJECTIVE

To evaluate plasma as a graft holding solution in terms of its efficacy in hair growth and hair graft survival.

METHOD

A split-scalp study was carried out comparing grafts transplanted on the right and left fronto-temporal areas selected as recipient sites in the same patient. In the initial study, we used mainly FUT grafts, and in the last phase, we used FUE grafts. A total of 6 patients have been enrolled in the study so far. The left side was designated as the control area (Group A), and the right side behaved as the test area (Group B), for comparison of the results. The right fronto-temporal area received grafts preserved in autologous plasma, while the left fronto-temporal area received grafts preserved in LR solution. Both sides were implanted with grafts harvested using the same technique, with an equal number of grafts of the same quality, and with the same implantation time. Grafts on both sides were implanted by two surgeons sharing similar experience and expertise using optical loupes for magnification (4.5×).

Both the autologous plasma and the LR holding solutions with the grafts were maintained at a temperature of approximately 12 ± 2°Celsius, whereas the room temperature was maintained around 18°Celsius.

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