

# LASER ASSISTED MICRO FOLLICULAR UNIT TRANSPLANTATION FOR SECONDARY CICATRICIAL ALOPECIA

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**Introduction:** Secondary cicatricial alopecia (SCA) cases are known for being difficult to treat. It has been estimated that the percentage of acceptance of transplanted hairs is reduced in scarred tissue by less than 50% (compared with >90% growth rate in normal non cicatricial tissue). This is due to limited vascular supply in areas of cicatricial alopecia, which affects graft viability. In addition to graft failure, sclerotic tissue also increases the risks of infection, ischemia, hypoxia, and necrosis due to the inadequate vasculature. Fractional carbon dioxide laser resurfacing (FxCr) has a remarkable effect on scar remodelling and revitalization of tissue. We hypothesized that our LASER Assisted Follicular Unit Transplantation (LAMFUT) technique would increase the number of viable grafts in cases of SCA.

**Material & Methods:** Twenty-seven patients diagnosed with SCA after previous surgeries and/or trauma were treated by FxCr using variable parameters to allow deep fractional ablation for 2-3 sessions; 1-2 sessions within one month before the date of surgery for induction of revascularization and *last session* on the same day of surgery immediately before the implantation step to determine the density plan and prepare holes for follicular units' insertion in the recipient area. Trichoscopy evaluation for hair density was done immediately after implantation, 10 days after surgery and 9 months after surgery. Three biopsies were taken; one from control scarring tissue without any treatment, second was taken after PRP (Platelets Rich Plasma) injection only for a scarring tissue, and third was taken twenty minutes after LASER and PRP treatment and immediately before implantation. The biopsies were stained by H and E, and Picrosirius Red Stain; further quantitative evaluation was made using circularly polarizing microscopy and IMAGEJ program for detection of colour changes to evaluate collagen regeneration. Digital photographic evaluation was made for comparison of pictures before and after 9 months.

**Results:** Using LAMFUT, we were able to have implanted hair follicles with approximately 1-2 mm hole to hole density ranging from 55 to 85 holes per cm<sup>2</sup>, compared to a pattern density spacing of 5 mm hole to hole distance done in a previous study by Kwon et al, 2007. After 9 months, hair regrowth was more than 90% of implanted grafts using trichoscope for re-evaluation. All the signs of revitalization including elasticity, colour and texture were improved according to the assessors' evaluation. Compared to previous studies, our results showed both higher density of hair implantation in SCA recipient areas and higher graft regrowth on using deep ablative LASER programmed technique. There was minimal popping up of implanted hair follicles and the intraoperative bleeding was almost null; thus, higher density in such cases was possible.

**Results:** LAMFUT is a new promising technique for optimizing results of Hair Transplantation in cases of SCA. Further studies should be done for providing histopathological evidence of improvement in LASER treated areas compared to untreated areas after Hair Transplantation, using Immunolabelling for related growth factors

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