



HAIR DISORDERS

FOLLICULAR REGENERATION IN RESPONSE TO WOUNDING IN CCCA

Nashay Clemetson⁽¹⁾ - Ginette Okoye⁽¹⁾ - Helena Pasioka⁽¹⁾ - Michelle Oboite⁽¹⁾ - Sewon Kang⁽¹⁾ - Luis Garza⁽¹⁾

Johns Hopkins University, Dermatology, Baltimore, United States⁽¹⁾

Background: Central centrifugal cicatricial alopecia (CCCA) is an inflammatory condition that causes permanent scalp alopecia in black women. Wounding has been shown to generate hair follicles de novo and ablative carbon dioxide (CO₂) laser therapy can create small wounds in the skin. In this exploratory study, we hypothesized that follicular regeneration in CCCA may be demonstrated by increased scalp hair counts, in response to wounding with a CO₂ laser.

Objectives: To determine if CO₂ laser ablation of affected scalp in CCCA leads to regeneration of hair follicles, upregulation of follicular neogenesis markers and clinical evidence of regrowth.

Methods: We enrolled 17 women with CCCA, age 18+ years and treated two areas of the scalp with a fractionated CO₂ laser. Pulse energy was 55mJ, 110mJ or 240mJ. Each subject was her own control, using a split scalp model. Photographs and punch biopsies were obtained. The difference in hair counts (baseline to final visit) was calculated and compared using the Wilcoxon signed-rank test.

Results: From baseline to final visits, average hair counts increased peripherally 73% vs 48% (treated vs untreated). Centrally, hair counts increased 66% vs 49%, treated vs untreated. At 240mJ, increase in hair counts peripherally, treated vs untreated areas was significant ($p=0.03$). Centrally, no significant difference at all pulse energy levels was noted. Preliminary data from microarray analysis suggest fibroblast activity increased in untreated areas and decreased in treated areas.

Conclusion: While the general trend was toward increased hair counts in all areas, the most significant change was noted at peripheral sites treated at the highest energy setting. Preliminary review of microarray data does not show an upregulation of follicular markers, but the incidental finding of upregulation of fibroblast activity in untreated areas and downregulation in treated areas is noteworthy. This significance is to be further elucidated.

