Intraoperative Indocyanine Green Laser Angiography in Pediatric Autologous Ear Reconstruction

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Background: Skin flap vascularity is a critical determinant of aesthetic results in autologous ear reconstruction. In this work, we investigate the utility of intraoperative laser-assisted indocyanine green angiography (ICGA) as an adjunctive measure of skin flap vascularity in pediatric autologous ear reconstruction.
Methods: 21 consecutive pediatric patients undergoing first stage autologous total ear reconstruction were retrospectively evaluated. The first 10 patients were treated traditionally (non-ICGA) and the latter 11 patients were evaluated with ICGA intraoperatively after implantation of the cartilage construct and administration of suction. Relative and absolute perfusion units in the form of contour maps were generated. Statistical analyses were performed using independent sample Student's t test.
Results: Statistically significant differences in exposure and infection were not found between the two groups. However, decreased numbers of surgical revisions were required in cases with ICGA versus without ICGA ($p=0.03$), suggesting that greater certainty in skin flap perfusion correlated to a reduction in revision surgeries. In cases of exposure, we found an average lowest absolute perfusion unit of 14.3 whereas cases without exposure had an average of 26.1 ($p=0.02$), thereby defining objective parameters for utilizing ICGA data in tailoring surgical decision making for this special population of patients.
Conclusions: Defined quantitative parameters for utilizing ICGA in evaluating skin flap vascularity may be a useful adjunctive technique in pediatric autologous ear reconstruction.