Successful Reconstruction of Complex Pediatric Nasal Lesions: Improving Outcomes Using a Dermal Regenerative Template in Pediatric Nasal Defects

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ABSTRACT

Background:

Dermal regenerate templates are currently widely used in both adult and pediatric burn reconstruction. Despite this, the safety and efficacy of regenerate templates combined
with full thickness skin grafts (FTSG) for the reconstruction of pediatric facial defects traditional treated with local flaps is not widely published. The aim of this study is to report the safety and efficacy of pediatric nasal defect reconstruction using regenerative templates/FTSG.

**Methods:**

A retrospective review of one institution's experience with pediatric nasal defects secondary to nevi or a vascular lesions treated with regenerative templates was performed. All patients (n=4) were treated with a multistage protocol and surgical outcomes were measured. Two reviewers independently assigned Visual Analogue Cosmetic Scale (VACS) scores: one surgeon, and one non-surgical researcher not involved in patient care. Standardized photographs (anteroposterior, oblique, lateral and worm’s eye view) were assigned VACS scores according to a 100 point scale: “Abhorrent”, 0-24; “Poor”, 25-49; “Moderate”, 50-74; and “Excellent”, 75-100. Statistical analysis was performed using Mann-Whitney U and Wilcoxon Paired Signed Rank tests, with significance p<0.05.

**Results:**

Four patients (two male and two female, average age 6.8 years) were identified who met the inclusion criteria. A total of five nasal lesions (two Spitz nevi, one vascular lesion, two congenital nevi) were removed. All patients underwent a two-stage procedure. Stage I included removal of the primary lesion and placement of a dermal regenerative template. Stage II included the removal of the silicone sheeting after adequate revascularization and full thickness post auricular skin graft placement. The average
operative time per lesion was 65.5 minutes for Stage I and 93.3 minutes for Stage II. The average time between the first and second operation was 13.8 days (range 10-19 days). The average graft area was 1.53 cm$^2$ (range 0.80-2.00 cm$^2$). The average duration of follow up after Stage II was 175.8 days (range: 51-328 days). Complete skin graft take occurred in all patients (100%). The preoperative VACS score was 45.2 (range 5-70), compared to 84.5 (range 45-100) postoperatively (p<0.000), indicating excellent results in all patients. Scores for preoperative versus postoperative views were: Lateral, 45.0 versus 84.0 (p<0.000); oblique, 38.8 versus 90.0 (p<0.000); anteriposterior, 53.8 versus 85.9 (p<0.000); worm’s eye view, 35.0 versus 81.3 (p<0.000). There was no significant difference between raters (preoperative, p=0.346; postoperative, p=0.678). There were no wound infections, bleeding requiring reoperation, or mortalities.

Conclusions:

The reconstruction of complex pediatric nasal lesions using dermal regenerative templates and full thickness post auricular skin grafts is safe and effective. Here, we utilize a staged technique. In Stage I, the primary lesion is removed and a dermal regenerative plate is placed. In Stage II, removal of the plate is performed and coverage is undertaken with a full thickness post auricular skin graft. This technique is associated with low morbidity, short operative times, and high rates of skin graft survival resulting in significant improvement in Visual Analog Cosmetic scores.