

BIOGRAPHIES

Craig R Dufresne, MD, FACS: Craig R Dufresne is Clinical Professor of Plastic Surgery at Georgetown and Virginia Commonwealth Universities. He earned his medical degree at Columbia University, completed his general surgery training at The Johns Hopkins Hospital and Medical Institutions, and his plastic surgery training at the Institute of Plastic and Reconstructive Surgery / New York University Medical Center. He received fellowship training in craniofacial and microvascular surgery at New York University Medical Center. His major research interests are in craniofacial surgery and fat and bone grafting. Dr Dufresne has delivered about 200 presentations and exhibits, written over 100 papers and book chapters, received grant funding for and conducted several research projects, and supervised and mentored many residents and students. He has been appointed to academic and institutional positions and visiting professorships at the US National Institutes of Health and various institutions in Maryland, Virginia, and DC. Dr Dufresne is a Fellow of the American College of Surgeons and member of the International Society of Craniofacial Surgery, American Society of Plastic Surgeons, American Society of Maxillofacial Surgeons, American Society of Aesthetic Plastic Surgeons, American Association of Plastic Surgery, American Cleft Palate-Craniofacial Association, and several other medical societies. He has served as or is currently a committee or board member of many of these societies.

Mikaela I Poling, BA: Mikaela I Poling is an unpaid Research Assistant in plastic surgery. She has nearly two decades of experience in craniofacial clinical research, is an Associate Editor of the *Journal of Pediatric Genetics*, as well as a reviewer for a number of journals (including *The Cleft Palate-Craniofacial Journal*), has presented at several conferences, published over twenty papers, and has led multidisciplinary research projects, including systematic reviews, a meta-analysis, and a clinical guideline task force. She has experience serving in various administrative, leadership, and community-engagement roles. In high school, she began mentored field research in limnology, geohydrology, and craniofacial surgery. She earned her undergraduate degree in history, with a specialisation in modern Western military medicine and surgery. While developing a long-range independent research plan with mentors in general surgery and plastic and craniofacial surgery, she completed several medical school clerkships during college. In particular, she gained supervised clinical experience caring for plastic surgery patients with full-thickness skin loss and multiple comorbidities. After completing undergraduate studies, she pursued advanced training in a clinical and applied physiology research fellowship. In this mentored setting, she continued her earlier work, obtaining a broad knowledgebase of human subjects research management and completing a graduate-level thesis, most of which has been published or is in review.



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Plastic & Reconstructive Surgery for Adults and Children

Free Dermal Fat Autografts for Complex Craniofacial Wounds: a three-decade, retrospective cohort study

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ABSTRACT

Background: Complex craniofacial wounds (CCW) are those refractory to initial treatment and may involve chronic infection, exposed hardware, irradiated tissue, and soft tissue volume loss. The reconstruction using free microvascular flaps involves considerable morbidity, is resource intensive, and cannot be used for immediate reconstruction in CCW. While free dermal fat autografting (DFA) is used extensively in many applications, its use treating CCW remains an unexplored but potentially attractive possibility. Aims are to (1) determine if free DFAs are an appropriate adjunct to eradicate infection or provide coverage for exposed hardware in CCW and (2) evaluate if free DFAs are a stable volume and contour reconstructive option for CCW.

Methods: Data extracted from office charts of a retrospective cohort comprising 33 consecutive patients (13 male; 20 female and aged 2- and 79-years), who underwent free DFA between 1985 and 2018 for ccw by a single plastic surgeon, were analyzed. Post-operative follow-up was 1-24 years (M=6.53, SD=7.91).

Results: Many patients had several concomitant wound complications. Most patients presented with a history of fracture caused by trauma. Primary pre-operative wound complications were dominated by infection (N 19), of which over 73% (N 14) were associated with non-autologous material. Seventeen had resolution of their pre-operative infection. Of the total (N 33), 78.79% were had stable grafts at follow-up [$\chi^2(3)=51.24$, $p<0.001$], with only 3 experiencing observable atrophy and 1 graft necrosis. In 4 patients, free DFAs were palpated during subsequent operative settings and found to be grossly intact, soft, and bleeding. Most of the cohort was complication free [$\chi^2(1)=8.76$, $p=0.003$], with 75.76% experiencing no problems involving the graft. Twenty-eight (84.85%) of 33 patients had therapeutic success with free DFA [$\chi^2(1)=16.03$, $p<0.001$].

Mechanism of injury ($\beta=0.34$, $p=0.037$) and pre-operative wound status ($\beta=0.42$, $p=0.016$) predicted therapeutic success [$R^2=0.96$, $f(11,6)=12.6$, $p=0.003$]. While 5 (15.15%) did not have therapeutic success, no additional problems arose related to graft.

Conclusions: Free DFA appears to be beneficial for treatment of CCW, showing low morbidity, graft survival and volume stability, effectiveness eradicating infection, and importantly, allowing immediate reconstruction. If substantiated in our on-going cross-sectional and prospective studies, these findings could herald a paradigm shift in research and therapy for CCW away from non-autologous products and free microvascular flaps.

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TABLES

Defect	N	Percent
Naso-orbital-ethmoidal fracture	2	6.06
Multiple craniofacial fractures	6	18.18
Post-craniotomy defects	3	9.09
Congenital craniofacial anomalies	8	24.24
Post-tumour resection defects	6	18.18
Orbital trauma and enucleation	2	6.06
Other deformity and tissue loss	6	18.18

Mechanism of injury	N	Percent
Gunshot wound	2	6.06
Motor vehicle accident	6	18.18
Other acquired cause	2	6.06
Tumour extirpation	6	18.18
Congenital	7	21.21

Primary pre-operative wound complications	N	Percent
Infection	19	57.58
Exposed hardware	2	6.06
Excessive scar tissue	3	9.09
Irradiated tissue	1	3.03
Soft tissue hypoplasia or defect	8	24.24

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