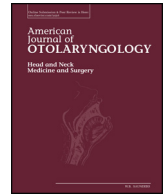




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Otolaryngology resident experience with supraclavicular, submental and other regional flaps in the United States

A.T. Day^{a,*}, L. Tang^b, U.A. Patel^c, J.D. Richmon^d, K.S. Emerick^d

^a Department of Otolaryngology – Head and Neck Surgery, UT Southwestern Medical Center, Dallas, TX, United States

^b Department of Otolaryngology – Head and Neck Surgery, University of Southern California Keck School of Medicine, Los Angeles, CA, United States

^c Department of Otolaryngology – Head and Neck Surgery, Northwestern University - Feinberg School of Medicine; John H. Stroger Jr Hospital of Cook County, Chicago, IL, United States

^d Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, MA, United States

ABSTRACT

Objective: Despite the resurgence in regional flap use, otolaryngology resident regional flap experience has been incompletely studied. We sought to characterize United States (US) otolaryngology resident exposure to, and perceptions of, supraclavicular flaps (SCFs), submental flaps (SMFs), and other regional flaps.

Methods: An online survey was disseminated every two weeks to 106 US otolaryngology residency program directors for distribution to residents within their programs between August and October 2016. 121 surveys were returned of which 106 were sufficiently completed and eligible for data analysis.

Results: Among residents with adequate responses, 52 were postgraduate year (PGY) 1–3 (junior) residents and 54 were PGY 4–7 (senior) residents. Senior residents participated in more pectoralis major flaps (mean: 8.1, 95%-CI: 6.5–9.8) compared to SCFs (mean: 1.5, 95%-CI: 1.0–2.0, $p < 0.001$) and SMFs (mean: 0.7; 95%-CI: 0.4–1.0, $p < 0.001$). Among senior residents exposed to SCFs, SMFs and pectoralis flaps, more individuals judged pectoralis major flaps as successful or very successful (96.2%, 95%-CI: 91.1–100%), compared to SCFs (64.3%, 95%-CI: 46.5–82.0%; $p < 0.001$) and SMFs (63.2%, 95%-CI: 41.5–84.8%; $p = 0.001$).

Conclusions: Senior otolaryngology residents were exposed to fewer SCFs and SMFs compared to pectoralis major flaps. Resident perception that SCFs and SMFs were not as successful as pectoralis major flaps should be investigated further.

1. Introduction

The field of head and neck reconstruction has evolved significantly over the last 40 years. The introduction of free tissue transfer techniques expanded reconstructive options and resulted in the collective decreased use of regional flaps [1]. Over the last decade, however, regional flap reconstruction has undergone a revival, particularly with the (re)-introduction of supraclavicular flaps (SCFs) and submental flaps (SMFs) [2,3]. There are many reasons for this change. Compared to their historical counterparts, these two flaps offer qualitatively favorable tissue that is much more similar to fasciocutaneous free tissue options. Advocates also argue regional flaps decrease operative time, length of hospitalization, donor site morbidity, and cost compared to free flaps [4,5]. Regional flaps may also be favored in patients with significant comorbidities, vessel-depleted necks, and locoregional failure requiring surgical salvage [1].

Given the relatively recent evolution of head and neck

reconstruction, current SCF, SMF and other regional flap reconstructive practices and outcomes are poorly described [6,7]. The SCF and SMF literature is predominantly comprised of retrospective, single-institution studies [2,3]. Specific defects preferred for reconstruction with SCFs and SMFs are not broadly-characterized [2,3]. SCF and SMF results are also unclear: reports of partial or total SCF and SMF loss range from 0 to 40% and 0–24%, respectively [2,3].

Concurrently, little is known about otolaryngology resident exposure to head and neck reconstructive procedures. Bhaya et al. surveyed graduated otolaryngology residents in 1997 about their regional and free flap exposure in residency [8]. Respondents reported participating in 11.2 pectoralis major flap reconstructions and 3.6 forehead flap reconstructions during residency; supraclavicular and submental flap exposure was not queried [8]. According to Baugh et al., 2014–2015 otolaryngology resident graduates were “resident surgeon” in an average of 68 “flap and graft” cases (range 20–242), but case exposure according to other surgeon type (teaching or assistant) or flap

* Corresponding author at: Department of Otolaryngology – Head and Neck Surgery, UT Southwestern Medical Center, 5323 Harry Hines Blvd, Dallas, TX 75390-9035, United States. E-mail address: andrew.day@utsouthwestern.edu (A.T. Day).

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type (local, regional, free) were not described [9].

The objective of this study is two-fold: 1) to evaluate current resident exposure to SCFs, SMFs, and other regional flap types, and 2) to characterize otolaryngology resident perceptions of SCF and SMF outcomes in United States (US) academic institutions.

2. Methods

An online survey was developed by the study authors in conjunction with the American Head and Neck Society Reconstructive Committee (AHNSRC). The survey went through multiple iterations until a final version was approved by the AHNSRC for dissemination. The study was approved by the Johns Hopkins Institutional Review Board (IRB00105887). It was disseminated via Survey Monkey (San Mateo, CA) every two weeks to 106 US otolaryngology residency program directors for distribution among their residents between 8/31/2016–10/14/2016. Among an estimated potential 1520 otolaryngology residents, 121 residents responded, with 106 returning adequately completed surveys. In the questionnaire, residents were asked to provide demographic information and describe: the number of specific regional flaps observed, the defect types reconstructed, and their perception of flap success. “Adequately” completed surveys included responses to all of the following: postgraduate year (PGY) level, program size, location, and exposure-number for pectoralis major, radial forearm free flap (RFFF), SCFs and SMFs.

The primary outcomes were the exposure of PGY 4–7 residents, or senior residents, to SCFs and SMFs and their perception of how successful these two flaps were. Ordinal ranges describing the number of resident-exposed flaps were converted to means for the purposes of analysis [0: (0); 1–2: (1.5); 3–5: (4); 6–10: (8); 11–20: (15.5); > 20 (25.5)]. STATA 14 (STATA Corp, College Station, TX) was used to perform descriptive statistics including Wilcoxon rank sum test for comparison of junior versus senior resident flap exposure. Wilcoxon signed rank test was performed to compare 1) flap-specific exposure among senior residents and 2) perceived flap success. Statistical significance was defined as $p < 0.05$. All p-values were reported as two-sided.

3. Results

Adequately completed surveys were obtained from 106 otolaryngology residents. As seen in Table 1, among residents with adequate responses ($n = 106$), 49.1% were junior residents (PGY 1–3) and 50.9% were senior residents (PGY 4–7). 82.1% of responding residents were from otolaryngology programs with three to five residents per year. A majority of residents (61.3%) were from three of the eleven US Census Bureau region divisions: South Atlantic (23.6%: DE, DC, FL, GA, MD, NC, SC, VA, WV), Middle Atlantic (19.8%: NJ, NY, PA), and East North Midwest (17.9%: IN, IL, MI, OH, WI). Only 7.5% of residents were from the West region of the US.

Overall, senior residents ($n = 54$) participated in significantly more types of regional flaps (including SCFs and SMFs) compared to junior residents ($n = 52$). Exceptions included the palatal island (senior resident mean flaps: 0.7, 95% CI: 0.3–1.1 versus junior resident mean flaps: 0.3, 95% CI: 0.1–0.4, $p = 0.20$), platysma (mean: 0.4, 95% CI: 0.1–0.6 versus mean: 0.1, 95% CI: < 0.01–0.2, $p = 0.22$), trapezius (mean: 0.3, 95% CI: 0.1–0.6 versus mean: 0.1, 95% CI: < 0.1–0.3, $p = 0.55$), and latissimus dorsi flaps (mean: 1.3, 95% CI: 0.8–1.8 versus mean: 0.8, 95% CI: 0.4–1.2, $p = 0.25$) given their rare usage. On average, senior residents are exposed to more radial forearm free flaps (RFFFs; mean: 15.8, 95% CI: 13.6–18.0; $p < 0.001$), a similar number of paramedian forehead flaps (PMFFs; mean: 6.8, 95% CI: 5.3–8.3; $p = 0.12$), and fewer “other” regional flaps (means: 0.3–4.0, 95% CI range: 0.1–5.6) compared to pectoralis major flaps (mean: 8.1, 95% CI: 6.5–9.8; Table 2). Senior residents are exposed to fewer SCFs (mean: 1.5, 95% CI: 1.0–2.0; $p < 0.001$) and fewer SMFs (mean: 0.7, 95% CI:

Table 1

Demographic characteristics of residents with adequate survey responses.

Number of participants	106
PGY – n (%)	
1–3	52 (49.1)
PGY1	9 (8.5)
PGY2	16 (15.1)
PGY3	27 (25.5)
4–7	54 (50.9)
PGY4	23 (21.7)
PGY5	28 (26.4)
PGY6	2 (1.9)
PGY7	1 (0.9)
Program size – n (%)	
1–2 residents	19 (17.9)
3–5 residents	87 (82.1)
Location – n (%)	
Northeast	
New England	13 (12.3)
Middle Atlantic	21 (19.8)
South	
South Atlantic	25 (23.6)
East South	4 (3.8)
West South	11 (10.4)
Midwest	
East North	19 (17.9)
West North	5 (4.7)
West	
Mountain	3 (2.8)
Pacific	5 (4.7)

PGY: post-graduate years.

Table 2

Senior resident flap type exposure compared to pectoralis major flap exposure.

Type of flap	Mean	95% CI	p-Value
Pectoralis major	8.1	6.5–9.8	REF
Supraclavicular	1.5	1.0–2.0	< 0.001
Submental	0.7	0.4–1.0	< 0.001
Radial forearm free flap	15.8	13.6–18.0	< 0.001
Anterolateral thigh free flap	11.7	9.2–14.2	0.028
Paramedian forehead	6.8	5.3–8.3	0.12
Temporalis	2.8	1.8–3.7	< 0.001
Temporoparietal fascia	2.3	1.6–3.0	< 0.001
Palatal island	0.7 ^a	0.3–1.1	< 0.001
FAMM	0.8	0.2–1.4	< 0.001
Platysma	0.4	0.1–0.6	< 0.001
Sternocleidomastoid	4.0	2.4–5.6	< 0.001
Deltpectoral	0.8	0.5–1.1	< 0.001
Trapezius	0.3	0.1–0.6	< 0.001
Latissimus dorsi	1.3	0.8–1.8	< 0.001

CI: confidence interval; FAMM: facial artery musculomucosal flap.

^a 53 responses.

0.4–1.0; $p < 0.001$) than pectoralis major flaps (Table 2). Less than 20% of senior otolaryngology residents responding to this survey have ever been exposed to a platysma flap (14.8%) or a trapezius flap (13.0%). Additionally, < 50% of senior otolaryngology residents responding to this survey ever participated in SMF (35.2%), palatal island (26.4%), FAMM (27.8%), deltopectoral (42.6%), and latissimus dorsi (48.1%) flap cases.

Among the 54 responding senior residents, 32 and 19 individuals were exposed to SCFs or SMFs, respectively. According to Table 3, 16% of these residents reported they had not been exposed to consistently successful reconstruction of any type of defect with a SCF or SMF. Among senior residents exposed to SCFs, 56.3%, 31.3%, and 25.0% reported witnessing consistently successful reconstruction of cutaneous, hypopharyngeal/pharyngoesophageal/laryngeal/onlay for suture line reinforcement, and oral cavity defects with the SCF, respectively. Among senior residents exposed to SMFs, 63.2% and 36.8% reported

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