Critical Importance of the First Postoperative Days After Head and Neck Free Flap Reconstruction: An Analysis of Timing of Reoperation Using the National Surgical Quality Improvement Program (NSQIP) Database

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BACKGROUND

Previous studies have suggested that unplanned reoperation following free flap reconstruction usually occurs within the first 48 postoperative hours.[1-3] However, these studies included heterogenous populations composed of widely different types of flaps, including breast free flaps, lower extremity free flaps, head and neck free flaps, among others. The heterogenous composition of the populations of these previous studies limits their ability to clearly outline a well-defined timeline to unplanned reoperation for each of the sub-populations mentioned. In light of this, our group previously studied the timing of breast free flap takebacks on a national level and was able to establish a national benchmark on rates and timing of unplanned breast free flap reoperation.[4] However, similar national timelines of unplanned reoperation for the lower extremity and head and neck free flap populations remains to be determined.

This study aims to analyze the timing and risk factors of head and neck free flap takeback on a national level. We consider that clearly outlining the timeline of free flap takeback is the first step in the process of optimizing post-operative free flap monitoring and enhanced recovery after surgery (ERAS) pathways for this population. We hypothesize that head and neck free flaps have a unique and consistent timeline to unplanned reoperation, which once outlined, will effectively guide postoperative management and monitoring.

METHODS

We analyzed all patients undergoing head and neck free flap reconstruction from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) 2012-2019 prospectively collected data.

The primary outcome of interest was time to takeback due to microvascular complications following head and neck free flap reconstruction that occurred within the first 30 postoperative days. Flaps were stratified based on tissue type (soft tissue free flaps and flaps with an osseous component) as well as reconstruction location (mandible, pharynx, maxilla, oral cavity, surface structures) for subgroup analysis. We further individually compared the first several post-operative days (0-1, 2, 3, and 4) as well as POD 5-30 to provide a detailed post-operative timeline. Visceral flaps were excluded from this analysis.

RESULTS

	# of patients (%)	p-value
Mean age in years (std. dev)	61.96 (12.3)	p = 0.7743
Body Mass Index (BMI)		p = 0.9945
<18.5	216 (5.53)	
18.5-24.9	1607 (41.4)	
25.0-29.9	1180 (30.2)	
30.0-34.9	566 (14.5)	
≥35.0	337 (8.6)	
Race		**p = 0.0412**
Black	312 (7.9)	
White	2681 (68.6)	
Other	913 (23.4)	
Functional Status		p = 0.7670
Independent	3815 (97.7)	
Partially Dependent	66 (1.69)	
Totally dependent	8 (0.2)	
Unknown	17 (0.44)	
Smoking		p = 0.4483
No	2624 (67.2)	
Yes	1282 (32.8)	
ASA Class		p = 0.5620
1-2	753 (19.28)	
3-5	3149 (80.62)	
None assigned	4 (0.1)	
Post-operative wound infection		p = 0.1432
Yes	148 (3.8)	
No	3758 (96.2)	
Flap Type		p = 0.9963
Soft tissue	3232 (82.7)	
Osseous	674 (17.3)	
Flap Location		p = 0.3610
Mandible	256 (6.6)	
Maxilla	228 (5.8)	
Oral Cavity	2372 (60.7)	
Pharynx	790 (20.2)	
Surface Structures	260 (6.6)	

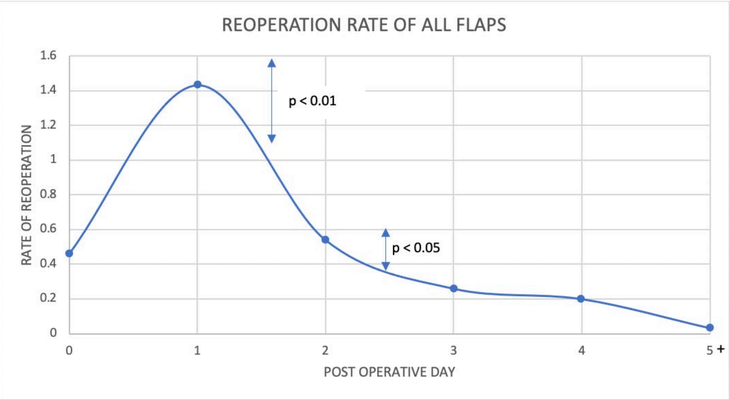

Figure 1. Reoperation rate among entire head and neck free flap reconstruction cohort, designated by postoperative day (*POD*).

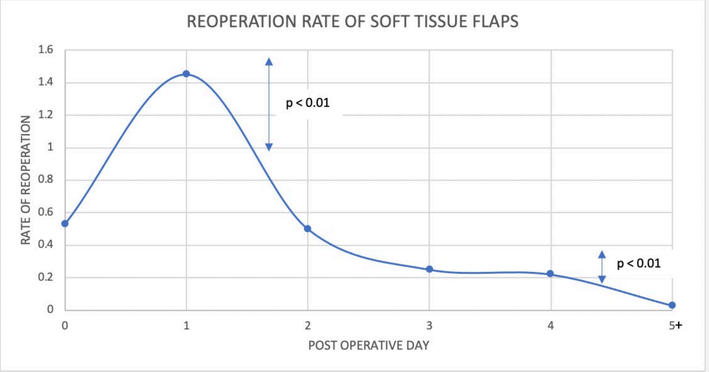

Figure 2. Reoperation rate for the soft tissue free flap reconstruction cohort, designated by postoperative day (*POD*).

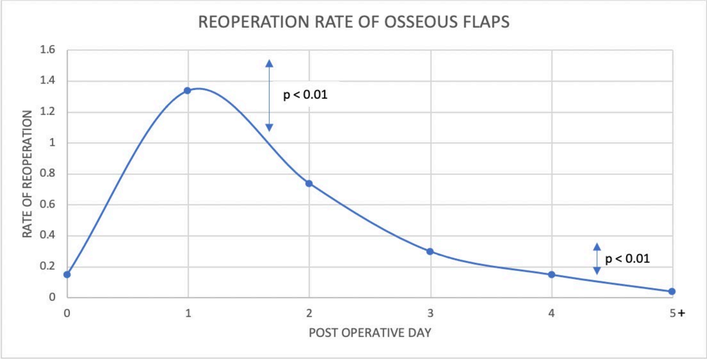

Figure 3. Reoperation rate for the osseous free flap reconstruction cohort, designated by postoperative day (*POD*).

CONCLUSIONS

This is the first national study to specifically analyze the timing of takeback in the head and neck reconstruction population. This data highlights the importance of flap monitoring during the first post-operative week; with ERAS pathway optimization aiming for discharge by the end of POD 5. Although, we acknowledge that hospital discharge depends on more factors than just the risk of takeback, based on data from this nationally validated timeline, we encourage institutions to strive to optimize their protocols and aim for discharge by the end of POD 5. This would represent a data-driven strategy to reduce the currently existing wide variability in length of hospital stay in this population.

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