

UC Irvine

UC Irvine Previously Published Works

Title

Assessing the Safety of Topical Epinephrine in Open Rhinoplasty.

Permalink

<https://escholarship.org/uc/item/7js4992x>

Journal

Facial plastic surgery & aesthetic medicine, 23(1)

ISSN

2689-3614

Authors

Hakimi, Amir A
Ahmed, Khwaja H
Nguyen, Theodore V
[et al.](#)

Publication Date

2021

DOI

10.1089/fpsam.2020.0362

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

RESEARCH LETTER

Assessing the Safety of Topical Epinephrine in Open Rhinoplasty

Amir A. Hakimi, BS,¹ Khwaja H. Ahmed, BS,¹ Theodore V. Nguyen, BS,¹
Edward C. Kuan, MD, MBA,² and Brian J.F. Wong, MD, PhD^{1-3,*}

Introduction

Timely intraoperative hemostasis is critical for adequate structural visualization and overall patient safety in rhinoplasty operations.¹ Moreover, residual blood between the nasal cartilaginous framework is associated with worse outcomes secondary to postoperative induration, fibrosis, and definition loss.² Prior literature has shown that topical concentrated epinephrine (TCE) is safe and effective for endoscopic sinus surgery (ESS), with only a single report discussing its use in cosmetic endonasal rhinoplasty.^{1,3-6} However, its use in open rhinoplasty is largely anecdotal and based on untested clinical practice rather than rigorous scientific testing. We sought to assess the safety of TCE in a consecutive series of patients undergoing open rhinoplasty and, in turn, provide a more objective evidence-based recommendation for its use.

Methods

Patients undergoing open rhinoplasty between November 10, 2017 to March 13, 2020 where 1:2000 TCE-soaked pledgets were used were retrospectively identified. The senior author uses TCE to control subcutaneous and intranasal mucosal oozing as needed throughout his operations, with consistent use throughout the course of each operation. Demographic and clinical data were gathered and categorized as shown in Table 1. Cardiac comorbidities that may predispose perioperative bleeding and cardiac events were recorded.

Intraoperative beta-blocker use, maximum systolic blood pressure (SBP) and diastolic blood pressure (DBP), maximum heart rate (HR), and intra- and postoperative adverse events, including atrial/ventricular dysrhythmias requiring electrocardiogram or further cardiac intervention, were recorded. Average hemodynamic parameters between

patients with and without cardiac comorbidities were compared using a two-tailed Student's *t*-test, using $p < 0.05$ for significance.

Results

TCE was used in 179 open rhinoplasty cases. The average age of patients was 40.7 ± 15.7 years. Patients with cardiac comorbidities had a significantly higher average maximum intraoperative SBP ($p < 0.001$) and DBP ($p = 0.003$) compared with healthy patients. Mean maximum intraoperative HR was higher in patients with cardiac comorbidities; however, this was not statistically significant ($p = 0.366$). A detailed summary of these results can be found in Table 1. Beta-blockers were used intraoperatively in 48 (27%) cases.

Two (1.1%) cardiovascular events were identified. In the first case, an otherwise healthy 58-year-old woman was noted to have a sharp increase in HR to 114 bpm shortly after TCE was used in the nasal cavity, which spontaneously decreased to 79 bpm within 10 min. The procedure was completed without incident. In the second case, a 57-year-old woman with a history of mitral valve prolapse developed asymptomatic atrial fibrillation with rapid ventricular rate several hours postoperatively. The patient was started on metoprolol with conversion back to normal sinus rhythm. Subsequent echocardiogram was normal, and no further intervention was warranted. She was discharged the following day.

Discussion

TCE was generally well tolerated in our patient cohort, with the risk of any adverse event being 1.1% overall and 4% among patients with cardiovascular comorbidities. This falls in line with previous studies assessing TCE in ESS.^{1,4-6}

In our study, patients with cardiovascular comorbidities experienced a significantly higher maximum intraoperative

¹Beckman Laser Institute and Medical Clinic, University of California—Irvine, Irvine, California, USA.

²Department of Otolaryngology—Head and Neck Surgery, University of California—Irvine, Orange, California, USA.

³Department of Biomedical Engineering, University of California—Irvine, Irvine, California, USA.

*Address correspondence to: Brian J.F. Wong, MD, PhD, Beckman Laser Institute and Medical Clinic, University of California—Irvine, 1002 Health Sciences Road, Irvine, CA 92697, USA, Email: bjwong@uci.edu

Table 1. Hemodynamic parameters among patients who underwent open rhinoplasty where topical concentrated epinephrine was used

	n (%)	Maximum SBP (mm Hg) (mean ± SD)	Maximum DBP (mm Hg) (mean ± SD)	Maximum HR (bpm) (mean ± SD)
Gender				
Male	87 (49)	126 ± 16.1	69.9 ± 14.7	102 ± 13.6
Female	92 (51)	125 ± 20.3	69.2 ± 14.1	107 ± 13.5
Intraoperative procedure				
Functional Rhinoplasty	151 (84)	127 ± 19.1	70.3 ± 14.9	104 ± 14.0
Cosmetic rhinoplasty	28 (16)	121 ± 13.0	66.2 ± 9.85	108 ± 11.1
Surgical history				
Primary rhinoplasty	141 (79)	127 ± 19.1	69.6 ± 14.5	105 ± 12.9
Revision rhinoplasty	38 (21)	124 ± 15.4	69.9 ± 13.7	103 ± 16.2
Cardiac comorbidity				
Yes	25 (14)	138 ± 21.2*	76.7 ± 18.0**	105 ± 15.5
No	154 (86)	124 ± 17.0	68.4 ± 13.4	104 ± 13.4

Cardiac comorbidity: hypertension, coronary artery disease, previous myocardial infarction, arrhythmia, valvular dysfunction.

bpm, beats per minute; DBP, diastolic blood pressure; HR, heart rate; SBP, systolic blood pressure; SD, standard deviation.

* $p < 0.001$, ** $p = 0.004$.

SBP and DBP, although their maximum HR was similar to the rest of the study population. However, due to the retrospective nature of this investigation, it is unclear if the increase in hemodynamic parameters is a direct result of TCE or secondary to factors such as general anesthesia and surgical manipulations. In addition, the mean age of our sample was 40.7 ± 15.7 years, which is representative of rhinoplasty patients, but may suggest that younger patients with lower baseline cardio-

vascular risk may more readily tolerate the effects of TCE. Future prospective studies examining older patients and patients with cardiac comorbidities undergoing open rhinoplasty operations are needed to further evaluate the effects of TCE among these populations.

Conclusions

TCE use in open rhinoplasty is generally safe to achieve hemostasis among young and otherwise healthy patients. In patients with known cardiovascular comorbidities, a risk assessment should be considered before use.

Author Disclosure Statement

The authors have no relevant conflicts of interest to disclose.

Funding Information

No funding was received for this article.

References

1. Kuan EC, Tajudeen BA, Bhandarkar ND, et al. Is topical epinephrine safe for hemostasis in endoscopic sinus surgery? *Laryngoscope*. 2018;129(1):1–3.
2. Gruber RP, Zeidler KR, Berkowitz RL. Desmopressin as a hemostatic agent to provide a dry intraoperative field in rhinoplasty. *Plast Reconstr Surg*. 2015;135(5):1337–1340.
3. Fernandez-Cossio S, Rodriguez-Dinten MJ, Gude F, et al. Topical vasoconstrictors in cosmetic rhinoplasty: comparative evaluation of cocaine versus epinephrine solutions. *Aesthetic Plast Surg*. 2016;40:637–644.
4. Orlandi RR, Warrier S, Sato S, et al. Concentrated topical epinephrine is safe in endoscopic sinus surgery. *Am J Rhinol Allergy*. 2010;24:140–142.
5. Korkmaz H, Yao WC, Korkmaz M, et al. Safety and efficacy of concentrated topical epinephrine use in endoscopic endonasal surgery. *Int Forum Allergy Rhinol*. 2015;5:1118–1123.
6. Gunaratne DA, Barham HP, Christensen JM, et al. Topical concentrated epinephrine (1:1000) does not cause acute cardiovascular changes during endoscopic sinus surgery. *Int Forum Allergy Rhinol*. 2016;6:135–139.