HYPERBARIC OXYGEN THERAPY USE IN OPTIMIZATION OF RHYTIDECTOMY POST-OPERATIVE OUTCOMES: A SCOPING REVIEW

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Introduction

- Hyperbaric oxygen therapy (HBOT) indications and use for facial plastic surgery patients have greatly expanded over the past two decades.
- Increasingly, providers are offering rhytidectomy patients pre- and/or post-operative HBOT to enhance and speed up post-operative recovery.

Objectives

- Summarize and evaluate the existing evidence on HBOT use in rhytidectomy patients.
- Evaluate consistency of treatment application and outcome measurement across included studies.

Methods

Study Type: Systematic Scoping Literature Review.

Databases: Embase, Scopus, Cochrane Library, Web of Science, and PubMed were searched from inception through September 13th, 2026.

Search Methodology: PICo-based systematic scoping review per PRISMA-ScR guidelines. Titles and abstracts, followed by full-text review was performed by two reviewers.

Screening/Inclusion Criteria: Studies reporting outcomes related to wound healing in patients undergoing rhytidectomy and pre- and/or post-operative HBOT in the perioperative period (within at least 12 weeks pre- and/or post-procedure).

Results

Study Selection: 58 imported studies → 38 removed duplicates → 20 Title & Abstract Reviews → 14 studies progressed to Full Text Review, 6 studies excluded → 4 studies included, 10 excluded on Full Text Review.

Included Studies:

1. Prospective controlled trial*
   n=13 (6 HBOT, 7 control)
   Pre- and post-operative HBOT use to reduce post-operative bruising.
   (Stong, 2010)

2. Case-control study
   n=20 (9 HBOT, 11 control)
   Post-operative HBOT use for delayed wound healing (n=1) or to enhance wound healing (n=8).
   (Neel, 2023)

3. Case report
   n=1
   HBOT use to manage wound-breakdown and skin flap necrosis in patient with significant sympathomimetic drug use post-operatively.
   (Prado, 2006)

4. Case report
   n=1
   HBOT use to manage wound-breakdown and skin flap necrosis in patient with preceding post-operative hematoma.
   (Vincent, 2025)

**voluntary participation/self-selection in treatment arm*

Data Reporting & Outcomes

Table 1. HBOT Treatment Paradigm and Reporting

HBOT Specifics	Stong[1]	Neel[2]	Vincent[3]	Prado[4]
Pre-operative Timing, day(s) pre-op	1, 2	N/A	N/A	N/A
Post-operative Timing, day(s) post-op	3, 4, 5	1-24	~32-42	7+
Number of HBOT Sessions, #	5	1-15 (avg 7.2)	5	10
HBOT Pressure(s), atmospheres	2.0	Not Reported	2.0	Not Reported
HBOT Duration, minutes	60	60-90 (78±5)	60	Not Reported

Table 2. Clinical Outcomes – Reporting and Significance

Outcomes	Stong	Neel	Vincent	Prado
Reduced Post-Operative Bruising	35% (POD7, p=0.005), 30% (POD10, p=0.03)	N/A	N/A	N/A
Reduction in Total Healing Time	64% or 24 days (p<0.001)	N/A	N/A	N/A
Resolution of Skin Flap Necrosis	N/A	N/A	100% (NS)	100% (NS)
Complications from HBOT sessions	None	None	None	None

POD#: Post-operative day #; NS: Not significant

Table 3. Patient Demographics and Characteristics

Patient Specific Variables	Stong	Neel	Vincent	Prado
Percent Female	100%	100%	100%	100%
Tobacco Use	Not Reported	10% (control)	0%	0%
Diabetes Mellitus	Not Reported	Not Reported	Not Reported	Not Reported

Discussion & Conclusion

- Despite increasingly widespread aesthetic, often private practice, use of perioperative HBOT, there is scant data on efficacy of it's use before or after rhytidectomy.
- There were no randomized controlled trials identified during literature review, introducing significant room for confounding results.
- Patient outcomes were inconsistently reported and no studies shared common reported outcomes in an objective manner.
- All studies reviewed consisted of exclusively female cohorts.
- Comorbid conditions with significant wound healing implications, such as diabetes or tobacco use, were inconsistently reported.
- All studies reported excellent outcomes, with statistically significant reductions seen in the outcomes of interest in both larger cohort studies.
- The lack of randomization, standardized and objective outcomes, and accurate reporting of treatment specifics precludes any definitive conclusions from the presented review.
- Given significant benefits seen in non-healing wounds and positive, albeit limited, data within rhytidectomy patients additional studies are warranted.
- Additional randomized controlled trials with clear objective reporting of outcomes, treatment specifics, and patient characteristics would be of significant clinical interest.

Citations: [1]Stong BC, Jacono AA. Effect of perioperative hyperbaric oxygen on bruising in face-lifts. Arch Facial Plast Surg. 2010;12(5):356-358. doi:10.1001/archfacial.2010.66. [2]Neel OF, Mousa AH, Al-Terkawi RA, Bakr MM, Mortada H. Assessing the Efficacy of Hyperbaric Oxygen Therapy on Facelift Outcomes: A Case-Control Study Comparing Outcomes in Patients With and Without Hyperbaric Oxygen Therapy. Aesthet Surg J Open Forum. 2023;5:ojad065. Published 2023 Jul 14. doi:10.1093/asjof/ojad065. [3]Vincent D, Sloan C. Superficial Temporal Artery Pseudoaneurysm and Wound Dehiscence Following Rhytidectomy and CO2 Laser Resurfacing in a 52-Year-Old Female. The American Journal of Cosmetic Surgery. 2025;42(4):243-245. doi:10.1177/07488068251355026. [4]Prado AS, Andrades P. Decongestant sympathomimetic drugs sold "over the counter" can produce skin slough of face lift flaps. Plast Reconstr Surg. 2006;117(4):1359-1361. doi:10.1097/01.prs.0000205573.32743.82. [5]Teguh DN, Bol Raap R, Koole A, et al. Hyperbaric oxygen therapy for nonhealing wounds: Treatment results of a single center. Wound Repair Regen. 2021;29(2):254-260. doi:10.1111/wrr.12884. [6]Abidia A, Laden G, Kuhan G, et al. The role of hyperbaric oxygen therapy in ischaemic diabetic lower extremity ulcers: a double-blind randomised-controlled trial. Eur J Vasc Endovasc Surg. 2003;25(6):513-518. doi:10.1053/ejvs.2002.1911