

# Increasing Amounts of Hyperbaric (HBO) Treatment Reduces the Area of Ischemic Tissue In Compromised Flaps Post-mastectomy

Tammy Ju MD, Cecilia Rossi BS, Andrew Sparks MS, Kara Couch MS CRNP CWS , Anita McSwain MD, Joanne Lenert MD, Christine Teal MD  
The George Washington University Hospital, Washington, DC

## Introduction

- The use of hyperbaric oxygen treatments (HBO) has been found to improve oxygenation for flap perfusion.
- HBO treatments are becoming integrated into the treatment for post-mastectomy patients to reduce the risk of nipple and flap necrosis, however its efficacy is not clear.
- The purpose of this study is to investigate the impact of hyperbaric treatments on the area of tissue ischemia after mastectomy with reconstruction.

## Methods

- A retrospective review was performed in 2016 from a single institution breast care center after receiving IRB approval.
- Adult female patients were identified who underwent mastectomy with reconstruction for a primary diagnosis of breast cancer or prophylaxis.
- Patients were referred to HBO treatment if the breast flap or nipple areolar complex was deemed compromised.
- Pre-operative variables such as age, smoking, diabetes, obesity, prior radiation treatment, and breast weight were documented.
- Number of HBO treatments including pressure regimens and timing of treatments were recorded.

## Methods cont'd

- Photos were taken of the compromised flaps before initial treatment and after last treatment, and compromised flap area measurements were recorded daily during treatment.
- Pre-operative variables, photos, and wound measurements were compared.
- Complications, such as necrosis, infection, and explantation within 60 days of surgery were also recorded.
- Statistical analysis using independent t-tests were used when appropriate. A p-value  $\leq 0.05$  was considered statistically significant.

**Table 1: Number of HBO treatments and wound size**

Number of HBO treatments	Pre treatment wound size (cm <sup>2</sup> )	Post treatment wound size (cm <sup>2</sup> )
3	2.55	2.1
9	10	7.6
10	28	3
11	24	15.2
11	1.4	0 (resolved)

## Results

- 6 patients were identified and 11 breasts were examined. All patients underwent nipple sparing mastectomy with reconstruction (tissue expander vs implant).
- Average age of patients was 44. Average breast weight was 319 grams. All patients had no history of smoking, diabetes, obesity, or prior radiation. 2 of 11 breasts ultimately underwent excision of necrotic tissue within 60 days and there were no complications of infection or explantation.
- The average number of HBO treatments a patient underwent was 6.8. 5 breasts had photos and wound measurements documented prior to and at the end of HBO treatment. The total area of compromised flap decreased consistently between initial photo and last documented photo for all 5 breasts from an average area of 13.2cm<sup>2</sup> at initial treatment and 5.6cm<sup>2</sup> at last treatment.
- An independent means student t-test comparing the volume of area before and after treatment resulted in a p-value of 0.12.

## Conclusions

- HBO treatments continue to be used as salvage therapy for flap or nipple necrosis after mastectomy. While HBO treatments are found to show clear and consistent decrease in compromised flap area with increased amounts of HBO treatments, the change in area was not significant.
- Further larger studies are needed to determine the improvement in flap compromise due to HBO treatments.