

Introduction

- Facial wrinkles are one aspect of age-related skin changes which are caused by a combination of genetic and environmental factors including: UV exposure, tobacco use, excessive alcohol intake, and air pollution
- Cigarette smoke in particular has shown to cause premature aging and accelerate the development of fine lines and wrinkles
- Repetitive squinting and lip pursing as well as heat exposure from the smoke contribute to development of lines around the mouth and eyes
- Free radicals in cigarette smoke damage repair mechanisms and reduce extracellular matrix turnover of collagen and elastin synthesis, leading to a decrease in collagen I and III
- Additionally, vasoconstrictive effects of nicotine leads to ischemia and loss of nutrients to epithelial cells
- It is important to note, the damaging effects of smoking correlate with amount of exposure and are additive to sun damage and alcohol use
- The objective of this study is to explore the effects of cigarette smoke on facial wrinkles and aesthetic outcomes after rhytidectomy and identify areas of the face that are prone to effects of cigarette smoke to allow more targeted cosmetic procedures.

Methods

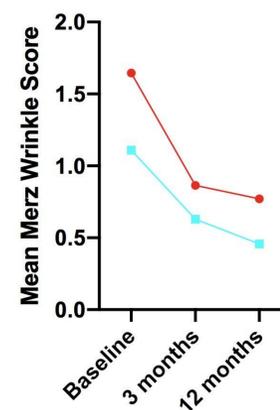
- Patients who underwent rhytidectomy at a single academic institution between June 2009 to September 2020 were identified by retrospective chart review.
- Procedures were performed by two facial plastic surgeons.
- Main outcome measure was the Merz wrinkle scale for pre- and post-operative photos at 3 and 12 months performed by a blinded scorer.
- infraorbital hollow, nasolabial folds, lip wrinkles, and marionette lines



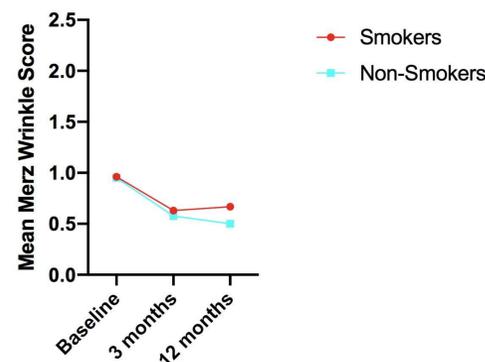
Results

- Of the 155 patients included in the analysis (12 men and 143 women), the mean age was 61.9 ± 7 years. 66 (42.7%) patients had a smoking history, with 7 current and 59 former smokers. Incidence of CO₂ laser and fat transfer was approximately equal. For the smoking group, average packs per day (PPD) was 0.70 and pack years was 16.4.
- Overall, both never-smokers and smokers showed significant improvement in all wrinkle categories at 3 months and 12 months postoperatively (all *p* < 0.001) except for nasolabial folds at 12 months in non-smokers (*p*=0.07). At baseline, smokers had significantly worse lip wrinkle scores compared to never-smokers (*p*=0.003), and continued to have worse lip scores at both 3 and 12 months, but no significant difference was detected.

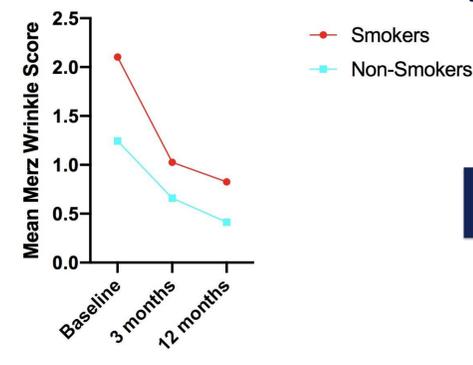
Lip Wrinkles



Lip Wrinkles: Facelift



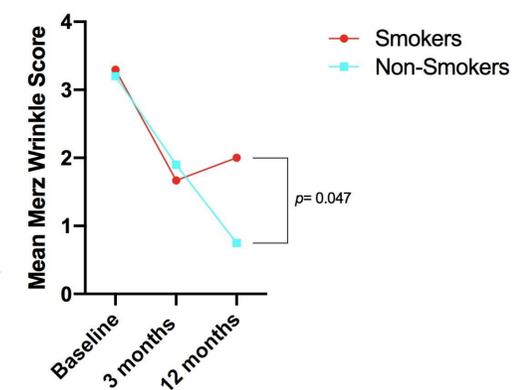
Lip Wrinkles: Facelift + Laser Treatment



Results cont.

- Those who had concurrent CO₂ laser at time of facelift started with higher mean lip wrinkle scores than those without laser at baseline (1.6 ± 1.2 vs. 0.95 ± 0.93)
- both smokers and nonsmokers showed greater improvement than those without laser.
- In the CO₂ laser group, smokers had significantly more lip wrinkles at baseline (*p*=0.0004) and 3 months (*p*=0.048) postoperatively compared to non-smokers, however by 12 months, no significant difference was observed.

Severe and Very Severe Wrinkles



	Smokers	Non-Smokers	p-value
Baseline	3.29 ± 0.47 (n=17)	3.20 ± 0.42 (n=10)	<i>p</i> = 0.607
3 mo	1.67 ± 0.77 (n=17)	1.90 ± 0.88 (n=10)	<i>p</i> = 0.470
12 mo	2.0 ± 0.82 (n=7)	0.75 ± 0.96 (n=4)	<i>p</i> = 0.047

Conclusion

- These results support previous findings that severity of facial wrinkling is greater in smokers, especially around the lips; however, facial wrinkling still significantly improved in smokers after rhytidectomy.
- Concurrent use of CO₂ laser improved wrinkling even more than facelift alone.
- This is additional evidence that tobacco use accelerates aging and could serve to deter patients from smoking.

References

- Goodman, G. D., Kaufman, J., Day, D., Weiss, R., Kawata, A. K., Garcia, J. K., Santangelo, S., & Gallagher, C. J. (2019). Impact of Smoking and Alcohol Use on Facial Aging in Women: Results of a Large Multinational, Multiracial, Cross-sectional Survey. *The Journal of clinical and aesthetic dermatology*, 12(8), 28–39. <https://pubmed.ncbi.nlm.nih.gov/17951030/>
- Vierkötter A, Krutmann J. Environmental influences on skin aging and ethnic-specific manifestations. *Dermatoendocrinol.* 2012;4(3):227–231.
- Koh, J. S., Kang, H., Choi, S. W., & Kim, H. O. (2002). Cigarette smoking associated with premature facial wrinkling: image analysis of facial skin replicas. *International journal of dermatology*, 41(1), 21–27. <https://doi.org/10.1046/j.1365-4362.2002.01352.x>
- Doshi DN, Hanneman KK, Cooper KD. Smoking and Skin Aging in Identical Twins. *Arch Dermatol.* 2007;143(12):1543–1546. doi:10.1001/archderm.143.12.1543
- Suehara, Leticia Yumi, Simone, Karine, & Maia, Marcus. (2006). Evaluation of facial aging related to cigarette smoking. *Anais Brasileiros de Dermatologia*, 81(1), 34-39. <https://dx.doi.org/10.1590/S0365-05962006000100004>
- Baspeyras, M, Dallara, J-M, Cartier, H, Charavel, M-H, Dumas, L. Restoring jawline contour with calcium hydroxylapatite: A prospective, observational study. *J Cosmet Dermatol.* 2017; 16: 342– 347. <https://doi.org/10.1111/jocd.12335>