

Histological Evaluation of the Effect of Oil Pulling on Oral Mucosa: A Case Report

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Abstract

Oil pulling, an ancient Ayurvedic oral hygiene practice, is associated with multiple oral health benefits. However, its effects at the histological level on oral mucosa remains underexplored. This case report evaluates the epithelial and immunological changes in the buccal mucosa of a 25-year-old female following 4 weeks of daily oil pulling with coconut oil. Histological and cytological analyses revealed improved epithelial integrity, reduced inflammatory infiltrate, and enhanced cellular turnover. The findings suggest a potential role of oil pulling in maintaining oral mucosal health.

Key words : Oil pulling, Oral mucosa, Histological evaluation, Exfoliative cytology.

Oil pulling (*Gandusha/Kavala*) is a traditional Ayurvedic practice involving swishing of oil in the oral cavity¹. It is believed to improve oral hygiene by reducing microbial load and inflammation². While clinical benefits such as reduction in plaque and gingivitis have been documented³, evidence regarding its histological impact on oral mucosa is limited. This report aims to evaluate epithelial turnover and mucosal immunity through cytological and histological assessment.

Case Report: A 25-year-old healthy female presented with mild gingival

inflammation and occasional oral dryness. She had no history of systemic illness, tobacco use, or recent medication.

The subject was instructed to perform Oil pulling with 10 ml of coconut oil for a duration of 15 minutes daily (empty stomach) for Study period of 4 weeks. Routine oral hygiene practices were maintained without modification.

Sample Collection: Site: Buccal mucosa. Technique: Exfoliative cytology using cytobrush (baseline and after 4 weeks)

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Cytological Processing : Smear preparation is done on glass slides and Fixation is done with alcohol.

Staining : Papanicolaou stain for cellular morphology

Immunohistochemistry for :

- Ki-67 (cell proliferation marker)
- Cytokeratin (CK13, CK14) (epithelial differentiation)



Figure 1. Swab is taken from Buccal mucosa

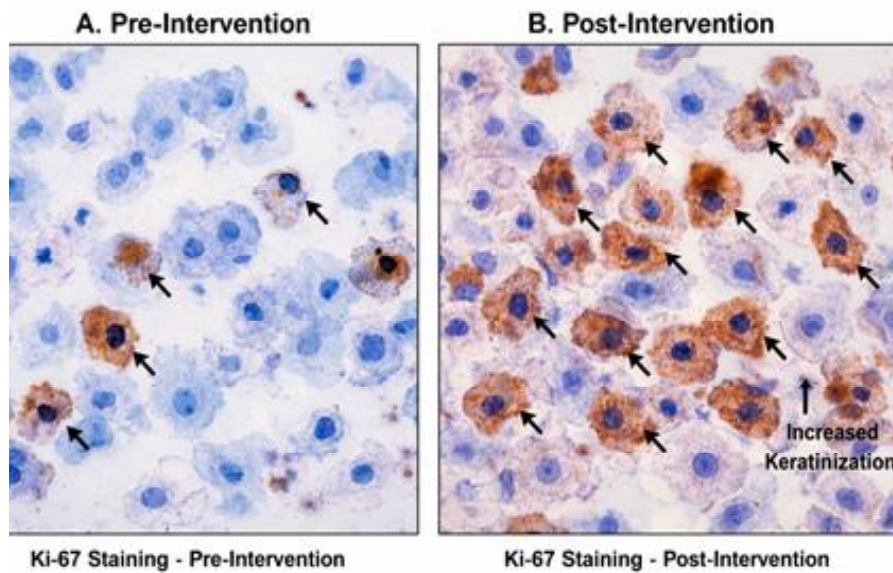


Figure 2. Histological slide of Oral mucosa pre and post intervention

Immunological Assessment :

Salivary analysis : Secretory IgA (ELISA)

Cytokine profiling : IL-1 β , IL-6, TNF- α

Microbial Analysis : Salivary *Strep-tococcus mutans* count using culture method (CFU/ml)

Outcome Measures : Nuclear-cytoplasmic ratio, Cellular morphology and keratinization, Presence of inflammatory cells, Expression of proliferation and differentiation markers and Changes in salivary immune markers.

Cytological findings :

Table-1. Result - Pre and Post intervention

Pre-intervention:	Post-intervention:
Increased inflammatory cells	Reduced inflammatory cell presence
Mild cellular irregularity	Improved cellular uniformity
Higher nuclear-cytoplasmic ratio	Normalization of nuclear-cytoplasmic ratio
	Increased keratinization indicating epithelial maturation

Immunological findings :

Increased salivary IgA levels.
Reduced pro-inflammatory cytokines (IL-1 β , TNF- α).

Microbial findings : Reduction in *Streptococcus mutans* count.

The findings of this case suggest that oil pulling may positively influence oral mucosa at the cellular level. The increase in epithelial thickness and Ki-67 expression indicates enhanced epithelial turnover, possibly due to reduced microbial irritation and improved local environment⁴. The antimicrobial action of coconut oil, attributed to lauric acid, may reduce bacterial load and inflammation⁵.

Improved salivary IgA levels indicate enhanced mucosal immunity, while reduction in pro-inflammatory cytokines suggests modulation of immune response⁶. The mechanical action of oil pulling may also stimulate salivary flow, contributing to epithelial nourishment and repair⁷.

These findings align with previous studies demonstrating reduction in plaque and gingival inflammation following oil pulling³, though histological evidence remains sparse. This non-invasive approach using exfoliative cytology provides a practical method for evaluating mucosal changes, making it suitable for larger clinical studies.

This case report demonstrates that oil pulling may enhance epithelial turnover and improve mucosal immunity at a histological level. It may serve as an effective adjunct in maintaining oral mucosal health. However, larger controlled studies are required to validate these findings.

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