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Oral Submucous Fibrosis: A Narrative Review of Aetiology, Pathogenesis and Diagnosis

Abhijith H N[1]
1 Professor, Department of Shalakya Tantra, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan

Abstract

Background: Oral submucous fibrosis (OSMF) is a chronic, progressive, scarring disorder of the oral mucosa, and sometimes the pharynx and upper oesophagus, that is strongly linked to areca nut use. It causes burning pain, loss of tissue elasticity and progressive trismus, and it is classified as an oral potentially malignant disorder.

Keywords: oral submucous fibrosis; areca nut; oral potentially malignant disorders; malignant transformation; trismus

Introduction

Oral submucous fibrosis (OSMF) is a chronic, insidious and largely irreversible disease in which progressive fibrosis of the lamina propria and submucosa stiffens the oral mucosa and restricts mouth opening

OSMF is recognised as an oral potentially malignant disorder in the international consensus nomenclature. Its dominant cause, areca (betel) nut, has been classified as carcinogenic to humans. Patients typically present with a burning sensation on eating spicy food, blanching and stiffening of the mucosa, palpable fibrous bands and progressive trismus. These features impair eating, speech and oral hygiene and make clinical examination and surgery difficult.

Geographically, OSMF is concentrated in South and Southeast Asia, including India, Sri Lanka, Bangladesh, Taiwan, Myanmar and Pacific island populations

Aetiology and risk factors

Areca nut is the principal cause. Epidemiological studies show a clear dose-dependent relationship between OSMF and both the frequency and duration of chewing areca nut, including without tobacco. Among its constituents, alkaloids (arecoline) are biologically the most important, tannins may act synergistically, and the high copper content of the nut is thought to promote fibrosis.

Commercial, freeze-dried preparations such as pan masala, gutkha and mawa deliver a high concentration of areca nut per chew and appear to cause OSMF

Pathogenesis

The central event in OSMF is an imbalance between collagen synthesis and degradation, which produces a stiff, poorly vascularised connective tissue.

- Epithelial injury and inflammation.
- Fibroblast activation.
- TGF-β/Smad signalling and hypoxia.
- Matrix cross-linking and reduced turnover.
- Progression towards malignancy.

Clinical features

The hallmark symptoms are a burning sensation and intolerance to spicy food, progressive trismus and difficulty swallowing. The buccal mucosa is most often involved, but fibrosis can extend to the soft palate, faucial pillars, labial mucosa, tongue and floor of mouth, and in advanced disease to the oropharynx and upper oesophagus. Early disease shows stomatitis, excessive salivation, blanching and blister formation. Later disease shows a pale, marble-like mucosa, thick palpable fibrous bands, xerostomia, loss of taste, restricted tongue protrusion and a reduced, fibrosed uvula. Quality of life declines as the stage advances.

Diagnosis

Diagnosis is primarily clinical: a history of areca nut use, characteristic symptoms, blanched and stiffened mucosa with palpable bands, and measured restriction of mouth opening. Incisional biopsy is advised when there is a red, white or ulcerated area, a non-healing lesion, or a suspicion of dysplasia or carcinoma, because these changes alter prognosis and management.

Conclusion

OSMF is a preventable, disabling and potentially malignant disease driven mainly by areca nut. Its prevalence is among chewers, and its malignant transformation at roughly 4–6%, with considerable heterogeneity. Pathogenesis centres on inflammation, fibroblast activation, TGF-β/Smad signalling, hypoxia and copper-dependent matrix cross-linking, but this knowledge has not yet produced a proven disease-modifying therapy.

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