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A short review: Oral Submucous Fibrosis (OSMF)

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ABSTRACT:
Oral submucous fibrosis (OSF) is a chronic condition characterized by abnormal collagen deposition in the oral submucosa, resulting in tissue scarring, dysphagia, and trismus. OSF is considered precancerous, with a transformation rate to malignancy ranging from 1.5% to 15%. This condition significantly impacts quality of life due to symptoms such as ulceration, xerostomia, and a burning sensation. This review provides a comprehensive analysis of OSF, focusing on its molecular mechanisms, diagnostic biomarkers, and therapeutic strategies. Betel nut chewing is a major risk factor, particularly prevalent in Asia. Despite efforts to identify biomarkers and test drug combinations, treatment remains predominantly symptomatic, aiming to alleviate inflammation and improve oral function. Rigorous clinical research is essential to develop molecular biomarkers and standardized treatment protocols. Enhanced oral health education is crucial for effective OSF management (adapted from sources [1, 2, 3]).

I. INTRODUCTION:

Oral submucous fibrosis (OSMF) is a chronic condition affecting the oral cavity and potentially extending to the pharynx. Initially presenting with vesicle formation and subsequent juxtaepithelial inflammation, OSMF progresses to hyalinization of the lamina propria, leading to stiffness of the oral mucosa and deeper tissues, which results in difficulties in eating, swallowing, and speaking.[4] Epithelial atrophy becomes pronounced in advanced stages of the disease. OSMF is recognized as a premalignant condition primarily associated with habitual areca nut (betel nut) chewing.[4]

Background:

In 1952, Schwartz initially described a similar condition in Indian women in Kenya, termed "AtrophiaIdiopathica (Tropica) Mucosae Oris," which later evolved into the recognized term OSMF.[4]

Areca nut consumption plays a pivotal role in the etiology of OSMF, with significant prevalence among South Asian populations who chew substances like Pan, Pan Masala, Gutka, Mawa, and Mainpuri tobacco.[5]

In 1953, Joshi introduced the term "oral submucous fibrosis" (OSF) to describe a chronic and debilitating condition of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues, including the lamina propria and deeper connective tissues, resulting in significant rigidity and restricted mouth opening. Although the buccal mucosa is most commonly affected, OSF can involve any part of the oral cavity, including the pharynx.[5]

Epidemiology:

Oral submucous fibrosis (OSF) is a significant oral precancerous condition prevalent in Asian countries, particularly where betel nut chewing is common. It is characterized by abnormal collagen deposition in the connective tissues, affecting mouth functions and significantly impacting quality of life with symptoms like ulceration, xerostomia, burning sensation, and restricted mouth opening. OSF has a potential for malignant transformation, underscoring the importance of understanding its clinical features, prevalence, transformation rate, and associated risk factors.[2]

The World Health Organization estimates that over 5 million people are affected by OSF globally, with a predominant occurrence among Indians and individuals of Indian origin. In India, prevalence has increased from 0.03% to 6.4% over the last four decades, with regional variations attributed to different varieties of gutka and areca nut mixtures. Despite governmental efforts to ban these products, the disease remains common, particularly among young to middle-aged groups and increasingly among school children and pediatric populations.[3]

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Clinical Manifestation and Diagnosis of OSMF:
Stages of OSMF: The stages of Oral Submucous Fibrosis (OSMF) can be described based on characteristic manifestations:

- **Stage 1:** Initially, OSMF presents with stomatitis, which includes features such as erythematous mucosa, vesicles, mucosal ulcers, melanotic mucosal pigmentation, and mucosal petechiae.

- **Stage 2:** As the disease progresses, fibrosis develops following the healing of ruptured vesicles and ulcers, which is a hallmark of this stage. Early lesions demonstrate a noticeable blanching effect on the oral mucosa. Advanced stages are marked by the presence of palpable vertical and circular fibrous bands in the buccal mucosa and around the mouth opening or lips. This results in a distinctive mottled appearance of the mucosa resembling marbling, caused by these thick, fibrous bands that blanch under pressure. Clinical signs include:
- Restricted mouth opening - Trismus
- Stiffness of the tongue
- Fibrotic floor of the mouth
- Depigmented gingiva
- Restricted movement of the soft palate

- **Stage 3:** Long-term complications of OSMF include the development of leukoplakia, a precancerous condition found in more than a quarter of OSMF patients. Speech and hearing impairments may also arise due to the involvement of the tongue and Eustachian tubes.[5]

Differential Diagnosis of OSMF: The following conditions should be considered based on oral manifestations:

1. Oral manifestations associated with scleroderma.
2. Oral manifestations linked to Plummer-Vinson syndrome (iron deficiency anemia).

Investigations:

1. Complete blood count (CBC)
2. Toluidine blue test
3. Incisional biopsy
4. Immunofluorescent tests (Direct and Indirect)

This clearly introduces the differential diagnosis and subsequent investigations for further evaluation.[6]

Treatment Strategies and Clinical Management of OSMF:

Oral submucous fibrosis (OSF) is a chronic condition predominantly affecting individuals in Asian countries, characterized by progressive fibrosis in the oral mucosa leading to significant functional impairments. Current treatment approaches for OSF encompass drug therapy, mouth exercising devices, and surgical interventions, although a standardized protocol remains elusive.

1. Clinical Drug Treatments:

Drug therapies for OSF primarily aim to alleviate inflammation and fibrosis within the oral mucosa. Corticosteroids such as hydrocortisone, triamcinolone, dexamethasone, and betamethasone are commonly used to suppress inflammation and reduce collagen formation.[1] Additionally, cytokines like interferon-gamma (IFN-γ) modulate immune responses and aid in managing OSF symptoms.[1] Enzymatic drugs such as collagenase, hyaluronidase, and chymotrypsin degrade extracellular matrix components, enhancing tissue elasticity and mouth opening in severe fibrosis.[1] Supplementation with vitamins and minerals complements drug therapy by alleviating symptoms like burning sensation and ulceration associated with OSF.[1]

2. Mouth Exercising Devices:

Non-invasive approaches such as mouth exercising devices are crucial in managing OSF-related trismus. These devices, ranging from prefabricated options like EZBite to custom-made oral stents, facilitate controlled stretching and strengthening of oral muscles to improve mouth opening.[2] Devices designed by Pati and Patil have demonstrated efficacy in enhancing oral mucosal elasticity and blood circulation, resulting in significant improvements in mouth opening measurements over several months.[2] Commercially available devices like TheraBite® and Dynasplint Trismus System® offer further options for tailored rehabilitation programs, improving patient compliance and functional outcomes.[2]

3. Elective Surgery:

For patients with severe OSF characterized by mouth opening less than 20 mm, elective surgery becomes necessary to alleviate symptoms and restore oral function. Surgical techniques involve scalpels, electrocautery, and lasers to release fibrotic bands restricting mouth

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movements.[3] Procedures such as coronoidectomy and soft tissue reconstructions using flaps like buccal fat pad, tongue, and nasolabial flaps have shown promise in improving mouth opening and reducing recurrence rates.[3] Recent advancements in laser surgery provide minimally invasive alternatives with reduced postoperative complications and improved wound healing outcomes.[3]

II. CONCLUSION:

OSF poses a notable challenge in effective management because of its intricate causes and varied clinical presentations. Although existing therapeutic approaches provide symptom relief and enhance functionality, the lack of uniform treatment guidelines underscores the need for additional research and clinical trials to improve results. Future research may investigate innovative therapies such as stem cell injections and targeted drug delivery systems to better address the underlying fibrotic mechanisms.

In conclusion, an all-encompassing strategy that combines medication, rehabilitation using mouth exercise devices, and customized surgical procedures is crucial for managing OSF. This approach aims to enhance patients' quality of life and halt the progression of the disease.

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