

PREVENTION OF ORAL MUCOSAL INJURY DURING ORTHODONTIC BRACKET TREATMENT

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Abstract

Fixed orthodontic treatment with bracket systems is a fundamental method for correcting malocclusion and improving dental aesthetics and function. Despite its clinical effectiveness, brackets, archwires, ligatures, and auxiliary elements frequently cause mechanical irritation of the oral mucosa. This may result in pain, inflammation, traumatic ulcers, and reduced patient compliance. Prevention of mucosal injury is essential for successful orthodontic outcomes. This article provides a comprehensive review of etiology, risk factors, clinical manifestations, and modern preventive strategies.

Keywords

Orthodontic treatment, bracket system, oral mucosa, traumatic ulcer, prevention, soft tissue injury

Introduction

Orthodontic bracket systems are widely used in modern dentistry to correct malocclusion. However, fixed appliances introduce mechanical components into the oral cavity that may traumatize lips, cheeks, tongue, and gingiva. During early treatment stages, patients often experience soreness and ulceration. Although adaptation occurs over time, repeated trauma may lead to persistent lesions and infection.

Etiology and Risk Factors

Causes include mechanical irritation from brackets and archwires, protruding wire ends, rough band surfaces, and improper positioning. Additional factors are poor oral hygiene, plaque accumulation, increased friction during chewing and speaking, hypersensitive mucosa, and systemic conditions affecting healing.

Pathophysiology

Continuous friction damages epithelial cells, triggering inflammation. Erythema and edema develop, followed by ulcer formation. Bacterial contamination may delay healing, and repeated trauma prevents re-epithelialization.

Clinical Manifestations

Symptoms include redness, swelling, pain, burning sensation, and traumatic ulcers on buccal mucosa or lips. Patients may have difficulty eating and speaking. Severe cases may involve secondary infection.

Preventive Strategies

1. Accurate bracket placement and use of low-profile designs.
2. Proper trimming and bending of archwire ends.
3. Application of orthodontic wax or silicone protectors.
4. Maintenance of optimal oral hygiene with soft brushes and mouth rinses.
5. Use of topical healing agents containing hyaluronic acid or chlorhexidine.
6. Dietary control to avoid hard and sharp foods.
7. Regular follow-up appointments for monitoring.

Patient Education

Patients should receive clear instructions about oral hygiene, appliance care, and use of protective materials. Psychological reassurance improves adaptation and compliance.

Special Considerations in Children

Children have more delicate mucosa and require parental supervision for hygiene and diet. Age-appropriate appliances and preventive emphasis are essential.

Conclusion

Oral mucosal injury is common but preventable during orthodontic bracket therapy. A comprehensive preventive approach improves patient comfort, compliance, and treatment success.

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