

Prevalence and Type of Oral Mucosal Lesions in Patients with Fixed Orthodontic Appliances

Rana Modassir Shamsher Khan¹, Khawaja Rashid Hassan², Muhammad Rizwan³ and Javeed Ashraf⁴

ABSTRACT

Objective: Specific objective of this study was to determine the Prevalence and type of oral mucosal lesions in subjects with orthodontic appliances during first month of treatment.

Study Design: Observation / Descriptive / Cross sectional study.

Place and Duration of Study: This study was conducted at Islam Dental College Sialkot for a period of 8 months.

Materials and Methods: Oral lesions can develop as a result of irritation due to intra oral orthodontic appliances but their prevalence is unknown. This study comprised of 200 subjects wearers of orthodontic appliances (age between 10 and 25 years). The presence and types of intra oral mucosal lesions were determined by using different clinical indices.

Results: Oral mucosal lesions such as desquamations, erosion, ulceration, and contusion were present in subjects with orthodontic appliances.

Conclusion: Fixed orthodontic appliance treatment had a higher risk of soft tissue lesions in oral cavity. Thus gentle instrumentation, vigilant banding, bonding and manipulation of the appliances needed to keep away from traumatic lesions. The careful handling is important in patient's motivation, successful treatment planning and outcome.

Key Words: Mucosal lesions, fixed orthodontic appliances

Citation of article: Khan RMS, Hassan KR, Rizwan M, Ashraf J. Prevalence and Type of Oral Mucosal Lesions in Patients with Fixed Orthodontic Appliances. Med Forum 2016;27(4):12-15.

INTRODUCTION

Fixed Orthodontic treatment facilitates in improving dentofacial aesthetics and above all it brings confidence to the subjects. The treatment of malocclusion is of great advantage that benefits it provides should be more important than any possible harm.¹ Intra-oral local lesions are the risks throughout fixed orthodontic appliance treatment. The discomfort, irritation, pain and ulcerations are common side effects caused by appliances of orthodontic treatment.^{2,3} The possible risk of fixed appliance treatment are three-fold: treatment failure; tissue injury; and tendency to dental disorders. Due to speedy metabolism of oral tissues in healthy adolescent orthodontic subjects, the unpleasant and painful injury heals quickly.⁴ During first month of treatment, subject may notice sores or ulcers inside

mouth. This happened because lips and cheeks are not used to rubbing against orthodontic braces. Over time the inside of mouth will adapt and subject will not having sores. In the literature it is seen that intra-oral tissues and extra-oral structures equally are at threat of injury. The laceration of lips, buccal tissues and gingiva is origin of ulceration. The fixed orthodontic appliance components such as molar bands, buccal tubes, brackets and long unsupported arch wires touching the soft tissue of lips can lead to ulcerations.² The excessive activities of tongue or cheek muscles also act as factor to trigger ulceration. For this reason the clinicians should evaluate and observe all aspect of treatment procedure to attain successful final result.⁵ Orthodontist should make sure that majority of the subjects get advantage with proper diagnosis, appropriate treatment planning, supervision and sensible intervention. The literature search reports that very few studies were dealing with prevalence and type of oral mucosal lesions during fixed orthodontic treatment. On the other hand, the lesions of soft tissues are frequently observed in every day clinical practice. As a consequence it influences enthusiasm treatment duration and motivation of patients.⁶ Thus, the aim of this study was to observe the prevalence and type of mucosal lesions in subjects with fixed orthodontic appliances.

¹. Department of Orthodontic / Dental Material² / Oral Pathology³ / Community Dentistry⁴, Islam Dental College, Sialkot.

Correspondence: Dr. Rana Modassir Shamsher Khan, Vice Principal / Associate Professor Orthodontics Islam Medical and Dental College, Sialkot.
Contact No.: 03334257564
E-mail: ranamodassir@yahoo.com

Received: December 13, 2015; Accepted: February 12, 2016

MATERIALS AND METHODS

The study included 200 patients' who have been bonding and banding wearers of orthodontic appliances within first month of their treatment. The study sample included 76 boys and 124 girls. The subject's age is ranged from 10 to 25 years with mean age 16.45.

The medical history was recorded. The oral examination was performed in all subjects and oral mucosal lesions were detected and documented. Then, information related to various verified allergies to known allergens and medications along with systemic diseases were recorded in the medical history.

Patients suffering from chronic or systemic diseases, allergy and the particular patients who were on prescribed medicines for above mentioned reasons were included in the "exclusion criteria."

The Ethical Committee of Islam Dental College, Sialkot approved the study. Before taking written consent, every member was comprehensively informed about the purpose of study. Prior to commencing the study, for the subjects who were younger than 18, the parents were asked to provide a written consent.

Oral examination was performed in all the patients by the Oral Pathology Specialists and based on an internationally accepted criteria, procedure was performed to detect oral mucosal lesions in a standard manner.⁸ Lesions were then recorded on the basis of their clinical appearance which included surface morphology, location, color, dimension, and consistency. Then they were categorized into four groups namely contusion, desquamation, erosion, and ulceration. The mucosal lesions which were present at the time of examination were documented.

The size of oral lesion was ranked from 1 to 3:

1. Lesion up to 1 cm.
2. Lesion from 1 to 3 cm.
3. Lesion larger than 3 cm.

Statistical analysis: SPSS Version 20 was used to analyze all the data provided.

RESULTS

Table No.1: Distribution and Prevalence of oral mucosal lesions

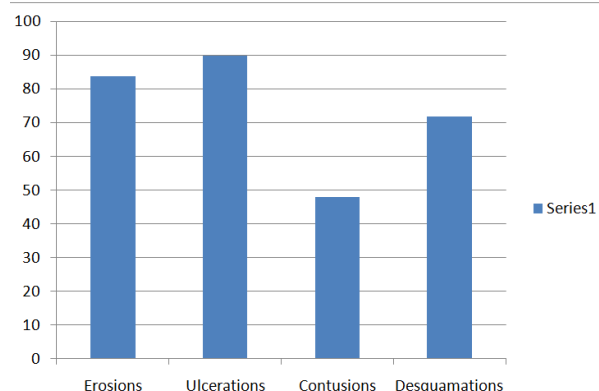
Total	Male	Female
200	76	124
Percentage	38%	62%

Mucosal lesions were detected in about 126 (63%) subjects with orthodontic appliances.

Therefore, apparently more than half subjects had some kind of lesion in oral cavity after the procedure of bonding and banding during the first month of treatment. The most common lesions in the study subjects were ulcerations (45%), erosions (42%), contusions (24%), and lastly desquamations (36%) because of injury that resulted due to usage of

orthodontic appliance. Thus it is seen that Contusions, ulceration, erosion, and desquamation were mostly observed in subjects wearing the fixed orthodontic appliances.

Mainly erosions and desquamations is caused by orthodontic brackets and ulcerations are originated by arch wire. (Table 1, Graph 1)



Graph No.1: Difference Oral Mucosal Lesions

DISCUSSION

In this study, it was revealed that the patients who wore orthodontic appliances are more prone to the development of mucosal lesions. In subjects having fixed orthodontic appliances, the most common reason of mucosal lesions was related to trauma resulting from the use of appliances. Moreover, erosion and ulceration were the most common mucosal lesions that were seen with fixed orthodontic appliances therapy. The Data obtain from Kvam et al explained that, 75.8% of subjects presented with small wounds, whereas 2.5% presented with bad ulcerations among the wearers of fixed orthodontic appliances, although the clinical manifestation of the small wounds was not well explained.² In a study carried out by Baricevic et al; erosion, ulceration, gingival inflammation, and contusion were declared as the most regular findings in orthodontic patients.⁹ According to the WHO scheme, the lesions resulting from fixed orthodontic appliances are localized on buccal and vestibular mucosa, where as the usage of arch wires and brackets are the reason of desquamations and erosions. Moreover, brackets and wires are reason of ulcerations on the lower lip. According to Travess et al.¹⁰ in patients of fixed orthodontic appliances, hyperplasia or ulceration developed by irritation due to bonds and arch wire or the wires which rest against the lips. The oral lesions which represented themselves with damaged epithelium and exposed nerve endings provoked painful feelings. The Data collected from the literature usually explained pain as a result of application of forces in order to bring tooth movement^{3, 11-13} instead of pain that results from intra-oral mucosal lesions.¹⁴ The subjects acquire oral

ulcers due to rubbing of cheeks and lips on brackets, bands or cleats as they become used to orthodontic appliances. Rarely lingual or palatal arches may cause ulceration to tongue or palate. According to Bergius et al motivation is the key of willingness to tolerate the pain throughout orthodontic treatment.¹⁵ For that reason, prevention of oral lesions means prevention of pain and raising the patient's enthusiasm for orthodontic treatment. We observed in our study that the majority of oral lesions were noticed in the first appointment after banding and bonding. Few patients according to the study suffered from stomatitis because of nickel allergy. In these cases, protective barriers like rubbers or ceramic brackets were used. Generally, careful fitting cautious use of instruments and handling of orthodontic appliances is needed in order to stay away from sharp edges. It was also observed from study that many orthodontists provide supportive management to the orthodontic subjects with ulcerations showing the importance of proper management of ulcers during treatment.¹⁶ Although, the tissues in oral cavity quickly adapt and toughen up to a new appliance, proper management is still required. The management hence can be divided into "preventive" and "definitive" therapy.^{17, 18} Usage of ortho-dental wax over the brackets and bands may highly reduce the chances of trauma. Use of tubing on the arch wire which is unsupported also helps to diminish the risk of iatrogenic damage. However, careful rounding-off of sharp edges of the particular appliance can also prove out to be helpful in this regard.¹⁹ From the large number of studies we evaluated, few of them were dealing with the prevalence as well as types of oral mucosal lesions in subjects with orthodontic appliances. Thus, this study was accepted and carried out to establish the type and prevalence of oral lesions in subjects with orthodontic appliances. As a result of trauma more soft tissue lesions were present in subjects with orthodontic appliances. The Clinical appearance of oral mucosal lesions as well as their locations was linked with the structure of appliance being used. The ability of the clinician to prevent oral lesions and treat them would significantly decrease the pain, increase patients' motivation and consequently treatment success.²⁰

CONCLUSION

Fixed orthodontic treatment is associated with increased risk of lesions in oral cavity.. Careful instrumentation, handling, fitting, and adjustment of the orthodontic appliances should be done to avoid oral mucosal lesions during orthodontic treatment. It is important in improving patient's motivation, treatment diagnosis, planning, and successful outcome.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Ellis P, Benson P. Potential hazards of orthodontic treatment what your patient should know. *Dent Update* 2002; 29:492–6.
2. Kvam E, Gjerdet NR, Bondevik O. Traumatic ulcers and pain during orthodontic treatment. *Community Dent Oral Epidemiol* 1987;15: 104–107.
3. Scheurer PA, Firestone AR, Burgin WB. Perception of pain as a result of orthodontic treatment with fixed appliances. *Eur J Orthod* 1996;18: 349–357.
4. Quintella C, Janson G, Azevedo LR, Damante JH. Orthodontic therapy in a patient with white sponge nevus. *Am J Orthod Dentofacial Orthop* 2004; 125: 497–499.
5. Profit WR. Orthodontic treatment planning: Limitations, Controversies and special problems. *Contemporary Orthodontics*, 4th ed. Elsevier Science; 2007.p 268-330.
6. Marinka B, Marinka M, Martina M. Oral mucosal lesions during orthodontic treatment. *Int J Paediatric Dentist* 2011;21: 96–102
7. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *J Postgrad Med* 2002; 48: 206–208.
8. WHO. Guide to epidemiology and diagnosis of oral mucosal diseases and conditions. World Health Organization. *Community Dent Oral Epidemiol* 1980; 8: 1–26.
9. Baricevic M, Mravak-Stipetic M, Majstorovic M, Baranovic M, Baricevic D, Loncar B. Oral mucosal lesions during orthodontic treatment. *Int J Paediatr Dent*. 2011; 21(2):96-102.
10. Travess H, Roberts-Harry D, Sandy J. Orthodontics. Part 6: risks in orthodontic treatment. *Br Dent J* 2004; 19:71–77.
11. Patel V Non-completion of orthodontic treatment: a study of patient and parental factors contributing to discontinuation in the hospital service and specialist practice, thesis. Heath Park: University of Wales,1989.
12. Brown D, Moerenhout R. The pain experience and psychological adjustment to orthodontic treatment of pre-adolescents, adolescents and adults. *Am J Orthod Dentofacial Orthop* 1991; 100: 349–356.
13. Murdock S, Phillips C, Khondker Z, Hershey HG. Treatment of pain after initial archwire placement: a noninferiority randomized clinical trial comparing over-the-counter analgesics and bite-wafer use. *Am J Orthod Dentofacial Orthop* 2010; 137: 316–323.

14. Kluemper GT, Hiser DG, Rayens MK, Jay MJ. Efficacy of a wax containing benzocaine in the relief of oral mucosal pain caused by orthodontic appliances. *Am J Orthod Dentofacial Orthop* 2002; 122: 359–365.
15. Bergius M, Broberg AG, Hakeberg M, Berggren U. Prediction of prolonged pain experiences during orthodontic treatment. *Am J Orthod Dentofacial Orthop* 2008; 133: 339.e1–339.e8
16. Apeksha M. Occurrence of Oral Ulcerations in Patients undergoing Orthodontic Treatment: A Comparative study. *Orthod J Nepal* 20133(2): 32-35.
17. Shaw WC, Maddy, Griffiths S, Price C. Chlorhexidine and traumatic ulcers in orthodontic patients. *Eur J Orthod* 2010; 6(1):137-140.
18. Greenberg M, Glick M. Ulcerative, vesicular and bullous lesions. *Burket's Oral Medicine Diagnosis and Treatment*, 10th ed. Elsevier Science; 2003.p. 46-59.
19. Asher C, Shaw WC. Benzydamine hydrochloride in the treatment of ulceration associated with recently placed fixed orthodontic appliances. *Eur J Clin Pharmacol* 1986; 31(2):127-31.
20. Ristic M, Vlahovic Svabic M, Sasic M, Zelic O. Clinical and microbiological effects of fixed orthodontic appliances on periodontal tissues in adolescents. *Orthod Craniofac Res* 10:187-195.