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The Prevalence Of Intra-Oral Complications In Orthodontic Treatment

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Abstract:

Orthodontic treatment aims at restoring correct occlusion and chewing function and improving the aesthetics of the dentition and facial esthetics of the patient but like any other treatment modalities, in addition to its benefits, it is also associated with risks and complications, it has the potential to cause significant damage to hard and soft tissues. This report aims to highlight the prevalence of the main intra-oral complications during orthodontic treatment.

Introduction:

Orthodontic treatment ensures proper alignment of the teeth and improves the occlusal and jaw relationship. This not only aids in better mastication, speech, and facial aesthetics, but also contributes to general and oral health, thereby improving the quality of life. The most important aspect of orthodontic care is to have an extremely high standard of oral hygiene before and during orthodontic treatment. Because bad oral hygiene will increase the risk of complications. However, the most commonly reported adverse effects of orthodontic treatment includes, Root Resorption, tooth discolorations, decalcification, periodontal complications, so It is essential that adequate safety measures are included with this type of treatment.

Discussion:

It has been shown that orthodontic forces represent a physical agent capable of inducing a traumatic and inflammatory reactions in the teeth and periodontium, This reaction is necessary for orthodontic tooth movement and may lead to a lot of complications including: ¹

1- Root Resorption¹

The First Study: by the American Association of Orthodontists, assessed the frequency of root resorption in 88 adults who had undergone orthodontic treatment. Pretreatment and posttreatment periapical radiographs were used to determine the amount of external apical root resorption of the maxillary and mandibular incisors. The number of incisors showing root resorption, including blunting, increased from 15% before treatment to 73% after treatment. The number of incisors having moderate to severe apical root resorption was 2% before treatment and 24.5% after treatment. ¹

Root resorption is considered as undesirable but unavoidable iatrogenic consequence of orthodontic treatment with high incidence, it is defined as the destruction of the cementum or dentin by cementoclastic or osteoclastic activity, This undesirable complication of orthodontic treatment may result in tooth mobility and even permanent tooth loss, It appears that apical root resorption is a result of a combination of mechanical factors, the extensive tooth movement following orthodontic forces duration and type of force are involved and biological factors like a genetic susceptibility, gender and medication intake have been demonstrated influence root resorption. ¹

2- Enamel Demineralization:²

The Second Study: A cross-sectional study was carried out to determine the prevalence and severity of enamel opacities in patients before and after orthodontic treatment. The sample consisted of 64 patients examined prior to orthodontic treatment with no presence of white spot lesions and applied orthodontics for 12 months. The results showed that there was a significant increase in both the prevalence 30 of 64 patients (46%) had at least one visible white spot lesion following completion of orthodontic treatment. ²

Enamel demineralization, usually on smooth surfaces, is unfortunately a common complication in orthodontics range from 2–96% of orthodontic patients, white lesions appear orthodontic appliance on the enamel may appear. These lesions are creating extra space conducive to adhesion of dental plaque a greater retention of the plaque is favored by arch wires with numerous loops and bends, additional arch wires, elastic ligatures, that leads to enamel demineralization, Untreated lesions can lead to the development of dental caries, and the discolored ones following color absorption from saliva to formation of brown discolorations and eventually dental caries, Preventive measures are important including good oral hygiene by the use of Fluoride mouthwashes throughout treatment can prevent white spot formation and dietary education of the patient to control their sugar intake is also needed in order to minimize the risk of decalcification.²

3-Periodontal Complications:³

The Third Study: this Indian study was done among a group of 194 orthodontic patients, examination was done to know the presence of periodontal tissue problems, 18% of patients had periodontal disease.³

Periodontal health is an important factor that may be used to evaluate the success of orthodontic therapy. Periodontal complications are reported to be one of the most common side effects linked to orthodontics, The periodontal complications associated with orthodontic therapy mainly include gingivitis, periodontitis, gingival recession or hypertrophy, The reasons behind these periodontal complications involve patient factors and the technique used in the treatment, Patient factors include: Presence of microbial plaque is reported to be the most important factor, past periodontal condition, increased susceptibility, and poor oral hygiene and Smoking, orthodontic factors include: the use of bands cause more gingival inflammation than bonds, which is not surprising since the margins of bands are often seated sub-gingivally and Orthodontic brackets and elastics might interfere with effective removal of dental and plaque composition may also be altered. There is an increase in anaerobic organisms and a reduction in facultative anaerobes around bands, which are therefore perio-pathogenic, thereby increasing the risk of gingivitis which may progress to periodontitis.³

4- Gingival Ulceration:³

The previous study also revealed that 91 from 194 patients (47%) had traumatic oral ulcerations. ulceration to the gingivae, and mucosa seen as areas of ulceration or hyperplasia, often occur during treatment or between treatment sessions from the archwire brackets bonds and long unsupported stretches of wire resting against the lips, The use of dental wax over the bracket may help to reduce trauma and discomfort as may rubber bumper sleeving on the unsupported archwire. Such complaints are usually temporary and tend to arise over the first 5-7 days after beginning treatment. Later, the mucosa adapts to the braces and the abrasions disappear.⁴

Another common complication is pain as 95% of the orthodontic patients experience varying degree of pain during orthodontic treatment due to occlusal discomfort, it depends on the individual and on their pain threshold.⁴

Conclusion:

The researches revealed higher prevalence of dental problems such as root resorption, oral ulcers, enamel demineralization, pain and periodontal diseases among orthodontic patients. Orthodontic practitioners should advise their patients to maintain proper oral hygiene for or each patient, there is a need to develop an oral hygiene protocol that should be followed both at home and at the dental practice.

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