

Editorial

Orthodontic Scars

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Received: October 29, 2017; **Accepted:** November 30, 2017; **Published:** December 26, 2017

Editorial

Orthodontic scars can be defined as the side effects which are seen during orthodontic treatment. They range from mild decalcifications, white spots, root resorption, lacerations, temporomandibular joint disorders in previously healthy hard and soft tissues, apart from treatment Orthodontic failure in itself. Orthodontic scars can be of the following types: lesions of enamel, gingivitis/gingival enlargement, gingival recession, dark triangles, impingements, ulcerations and lacerations and indirect damage by an allergic reaction to nickel, latex. There should be guidelines for the practicing orthodontist to prevent the unwanted occurrence of these side effects of orthodontic treatment.

The conditioning of the enamel surface with phosphoric acid causes loss of enamel surface contour. Etched enamel is predisposed to the development of initial caries, resulting in discolorations such as white spots. Even after removal of the brackets, the histologically changed tooth structure may be more susceptible to decalcification processes.

Alternatives to acid etching

Polyacrylic acid solutions, which contain residual sulfate ion, produce, in addition to slight etching, a crystalline deposit that bonds firmly to the enamel surface and resist mechanical removal. The crystals were shown to be calcium sulfate dihydrate (gypsum). The crystal formation depends mainly on the sulfate ion concentration in the polyacrylic acid solution and is independent of the molecular weight or concentration of the solution. The potential value of this crystalline interface as mechanical interlocking for orthodontic bracket bonding was tested *in vitro* by Maijer and Smith.

Demineralization

Enamel decalcification remains a common negative sequela of orthodontic treatment in the absence of proper oral hygiene. The presence of white spot lesions after removal of orthodontic appliances is a discouraging finding to a specialty whose goal is to improve facial and dental aesthetics. Orthodontic treatment with multi-banded appliance imposes a significant risk for development of WSL. The most common type is a diffuse opacity. The opacities covered an average of less than 1/3rd of the labial surface of the tooth.

Enamel demineralization scale

- 0 - No enamel opacity or surface disruption
- 1 - An opacity without surface disruption, or mild demineralization
- 2 - An opacity having a roughened surface or moderate

demineralization

- 3 - An opacity requiring a restoration, or severe demineralization

Fluoride is known to inhibit lesion development and to enhance its remineralization after treatment. Daily use of fluoride along with good oral hygiene leads to a significant reduction in demineralized areas.

External apical root resorption

External apical root resorption is the most common and frequent iatrogenic consequence of orthodontics. Fortunately, truly severe resorption that threatens the longevity of the tooth is rare. RR has a multifactorial etiology; although it has been recognized as a consequence of mechanically induced tooth movement, its causes are still poorly understood. Therefore it is not possible to predict who will develop RR or the extent of involvement.

Classification

Can be classified into at least 3 categories:

1. Surface resorption
2. Inflammatory resorption and
3. Replacement resorption

Surface resorption occurs constantly as micro defects on all roots; these normally repair themselves without notice. It can occur anywhere on the root but is most common periapically. It stops when the inciting agent (pressure) is removed and there is repair of the cementum.

Inflammatory resorption occurs when root resorption progresses into the dentinal tubules to pulpal tissue that is infected or necrotic or into an infected leukocyte zone.

Replacement resorption produces ankylosis of the tooth because bone replaces the resorbed tooth substance.

Enamel wear and fractures

Enamel wear has been reported to occur when ceramic brackets are in contact with enamel surfaces even for very short times. Enamel fractures are the most serious problem associated with ceramic brackets and have been reported to occur during debonding or from accidental impact. Ceramic brackets because of their low fracture resistance and high bond strengths, can pose a problem when being removed, either to reposition or at the completion of treatment. The bracket/adhesive bond strength may exceed that of the enamel/adhesive bond strength, such that when the bracket is removed some enamel may be removed at the same time. Bracket breakage while removing it increases treatment time and has the potential health risk of swallowing or aspirating bracket fragments.

Injuries from orthodontic appliances

The standard facebow has been pulled out, knocked or taken out of buccal tubes while still attached to the headgear or neckgear

during sleep. The elastic traction then acts like a catapult and caused the facebow to recoil, and hit the patient on the face, head or neck. Another problem is for the facebow to be dislocated during sleep and cause damage and injury to the soft tissues. Three serious eye injuries from face-bows have been reported during use of facebows. Trauma associated with the eye injuries may pose additional problems due to the presence of oral microorganisms on the face-bow at the time of injury increases the risk of infection. Despite appropriate antibiotic therapy, any resulting infection can be very difficult to treat and on

several occasions has been unsuccessful, leading to the loss of the eye. With the injury to one eye, there is always the possibility of the loss of sight in the other eye because of contralateral endophthalmitis. Because the inner arms of the face-bow are the same width as the eyes, there is a greater risk of a bilateral injury to the eyes. Penetrating injuries of the eye may be relatively asymptomatic, which might delay the patient in seeking treatment.