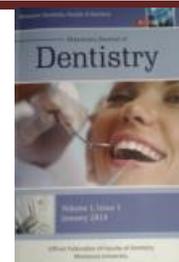




## Bond Strength of Orthodontic Brackets to Fluorosed Enamel; Review



Amal Abd alqader Abd Allah Basalamah<sup>1</sup>, Dr. Ahmed Maher Fouda<sup>2</sup>, Dr. Mona A Montasser<sup>3</sup>

### Abstract:

A definite disorder in formation of tooth with side effect on a cosmetic, is distinct as chronic condition stimulated by fluoride in which developing of enamel is disordered and the enamel is less non organic content<sup>1</sup>. Purely, fluorosis of teeth is state in which incorporation high fluoride percent in the forming of tooth enamel<sup>2</sup>.

### Introduction

An important morphologic finding seen in fluorotic enamel is that the presence of brownish discoloration in the surface enamel, which is proportional to the degree of fluorosis. This is because exposed porous fluorotic enamel may take up stain from the oral environment. Less advanced forms of fluorosis which did not show any surface damage also showed uptake of stain. Though this kind of posteruptive change does not occur in milder forms of fluorosis, this could probably be dependent on the nutritional habits of the persons.<sup>3</sup>

#### 1. Dental Fluorosis Measurements:

The measurement of teeth fluorosis in the 20th Century involved scores and photos procedures. An index for measuring any state must be delicate, easily manipulated and dependable<sup>4</sup>. The measurement indices for fluorosis that used were:

##### 1.1. Dean's Index<sup>5</sup>

Firstly; this is designated in 1934, then far along improved in 1942. This index was detected to obtain an idea about the connection between spotted enamel and fluoride level in consumption waters. The people with visual signs of dental fluorosis also can estimate the real biologic properties of fluoride on formed enamel, It confirm the fluorosis effect on artistic feature.

##### 1.2. The Community Fluorosis Index-1946:

Dean was suggested another index. This index gifts more details to the theDean's index scores.

Normal is granted zero, while half to questionable and one, two, three, four to very mild, mild, moderate and severe separately.

##### 1.3. Thylstrup and Fejerskov Index (TFI):

Thylstrup and Fejerskov were proposed this ndex in (1978)with goal of correcting the short comings of the first index. Similar to the DI, the scoring system of TFI is established on dentition which resulting in a more than twenty-eight grades per subject. It consist of ten scale with symbols from zero to nine. This unique index of fluorosis tries to connect expression finding with pathological

deviations in tissue through description ten types include explanation of all tooth surface.<sup>6</sup>

#### 1.4. Total Surface Index of Fluorosis (TSIF):

Horowitz et al (1984)<sup>7</sup> was proposed this index. It permit to differentiate valuation of beautifying fluorosis i.e fluorosis staining, pigmentation or spotting on surfaces observable to others, trying to decrease some of disadvantage of Dean's index. The authors give each unrestored tooth surface isolated score. An incisors and canines are consigned Two scores(from the facial and palatal aspects) and the premolars and molars gave three score(from the buccal, lingual and occlusal aspects).<sup>5</sup>There are 7 categories according to tooth surface index of fluorosis.

#### 2. New Concept in measurement of Dental Fluorosis:

examiners,remoteexaminersscoringisthe use of clinical photographs in measurement of dental fluorosis came into limelight in the 21st century.Photographs came into use because the indices that were used untilthenweresubjectiveandpronetobias. During examinations; the examiners can be taken clinical photograph and graded separately. Also photography permits archiving, longitudinal changes valuation, scoring by multiple permitted, and improves exercise groups construction for graduation.

##### 2.1. Measurement of Dental Fluorosis:

Views:

- 1) A visual analogue scale (VAS) by Vieira et al 2005.
- 2) Quantitative Light Fluorescence Assessment of Dental Fluorosis by Prettyetal2006.
- 3) Quantitative Light Fluorescence and Polarised white light assessment of dental fluorosis—Prettetal2012.

#### 3. Bond strength of fluorosed enamel:

The bracket failure repeatedly at the enamel interface of fluorosed teeth make Bonding of brackets a important clinical challenge. In fluorosed enamel; bracket bonding represent as challenges to orthodontists even more than bonding brackets to fixed prosthesis or restoration made of amalgam, gold, and porcelain.<sup>8</sup>

An outer hypermineralized of fluorosed enamel exhibits layer with resistance to etching, where it is resistant to get bonds resulting in a not dependable etching of enamel surface.<sup>9</sup>The bonding to fluorosed teeth considerproblem to restorative dentists.<sup>10</sup>

#### 4. Methods to improve bond strength of fluorosed teeth:

The bond strength of bonded orthodontic brackets should be sufficient to withstand orthodontic forces applied during treatment. The ideal orthodontic adhesive should have adequate bond strength. Reynolds mentioned 5.9–7.8 MPa resistances are enough to withstand any type of force.

<sup>11</sup>Bishara et al. observed 10.4 and 11.8 MPa of mean bond strength respectively with composite resin and conventional adhesive system. <sup>12</sup>

##### 4.1. Air abrasion:

Air abrasion is method that has been applied in order to strengthen the bond strength to fluorosed teeth. This method, in which the enamel surface is roughened, can be used during orthodontic treatments. <sup>13</sup>

##### 4.2. Deproteinization with sodium hypochlorite:

Sodium hypochlorite (NaOCl) was firstly introduced in endodontics. It was used as intra canal an irrigating solution to disinfect, and remove debris and organic materials from the canals. <sup>14 15</sup>

##### 4.3. Adhesive promoters:

An alternative method of bonding to fluorosed teeth is utilizing of Adhesion promoter. The bonding with utilization of adhesion promoters permits to use a chemical dimension by the clinician, which may be more expected. An adhesion promoter consists of the primer, which is an aqueous solution of hydroxyl ethyl methacrylate (HEMA) and a poly alkenoic acid, which aids in governing of wetness.

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