Talking with Patients

Dental Fluorosis

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WHAT IS IT?

Dental fluorosis is a generalized dental enamel condition that occurs when systemic fluoride is used in excess of the recommended dose for caries prevention. Fluorosis can be a significant esthetic concern because of the yellow, orange, and/or white discoloration that accompanies it. Fluoride is safe and important for the prevention of dental caries in both children and adults when applied topically to teeth in toothpastes, varnishes, and so on. In fact, the significant reduction in caries incidence over the past two decades has been attributed mainly to the widespread correct use of fluoride. However, when given systemically in high levels to young children, the excess fluoride interferes with the proper formation of the dental enamel, the hard shell that covers the tooth's crown, resulting in enamel fluorosis.

Current studies estimate that between 2 and 12% of children living in communities with fluoridated water present signs of dental fluorosis. Those at highest risk of developing fluorosis on the front permanent teeth are children between 18 and 36 months of age. Examples of systemic fluoride that, when used incorrectly, can result in fluorosis include fluoride supplements given to young children and excessive swallowing of fluoride-containing toothpaste by children. Individuals who live in areas where the well water contains excessive levels of fluoride also can develop fluorosis. The safe recommended concentration of fluoride in the drinking water is one part per million.

HOW IS IT DIAGNOSED AND TREATED?

Fluorosis can be diagnosed by visual examination. This diagnosis can be confirmed by reviewing the patient's medical history, with attention to systemic fluoride use. The clinical manifestation of dental fluorosis can be more or less intense depending on the amount and duration of fluoride ingestion and the age of the person who ingests the fluoride. Fluorosis can result in defects that range from subtle and superficial white spots with a smooth and hard enamel surface, to multiple and deep white-brown spots that look like cavities or mottled teeth. These defects appear as soon as the affected permanent teeth erupt in the mouth. Fluorosis leaves the enamel more porous than normal enamel; therefore, it is more susceptible to staining. It is important to note that the excess fluoride does not make the teeth more resistant to cavities.

Superficial fluorosis stains can be removed with a technique called microabrasion, which is the selective removal of the stained enamel and subsequent tooth polishing using a mildly acidic abrasive paste applied by the dentist. Sometimes tooth whitening can be used along with microabrasion for a more effective and uniform esthetic result. Once removed by microabrasion, these stains do not return. Pronounced, deep, and cavitated fluorosis defects can be treated with composite bonding in children and with porcelain veneers in adults. Severely affected teeth sometimes have to be treated with crowns.

CONCLUSIONS

Fluorosis is a dental enamel defect that is caused by excessive systemic use of fluoride. Dental fluorosis results in stained and/or spotted enamel. These defects might render the teeth more susceptible to plaque accumulation and staining than normal teeth. Fluorosis is treated with microabrasion, composite bonding, porcelain veneers, or crowns. Fluoride, when used correctly, is important for caries prevention in children, teenagers, and adults. Your dentist can provide you with more information about the correct use of fluoride for caries prevention.

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*Teeth affected by fluorosis (*left*) and then treated with porcelain veneers (*right*). Photographs courtesy of Dr. Harald O. Heymann, University of North Carolina School of Dentistry, Chapel Hill, NC, USA.*