University of Aden

Fuculty of Medicine & Health Science

Dentistry section

Oral pathology

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Enamel hypoplasia

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Enamel Hypoplasia

concept:

A developmental disturbance of teeth characterised by deficient or defective enamel matrix formation; may be hereditary, as in amelogenesis imperfecta, or acquired, as encountered in dental fluorosis, local infection, childhood fevers, and congenital syphilis.

Introduction :

In hypoplasia, there is a lack of development or a defective development of the enamel of the tooth before its eruption. In deciduous teeth, enamel hypoplasia can be caused by a disturbance in the enamel formation before birth and, for some deciduous teeth, after birth. In permanent teeth, enamel hypoplasia can only be caused by some disturbance after birth since enamel formation of the permanent dentition begins at birth. Enamel prisms are deposited by the enamel organ in a definite pattern to form the crown of the tooth. A local disturbance may interfere with this process and result in defective development. The degree of the defect (hypoplasia) varies from mild, shallow depressions or grooves to extensive grooves or pits arranged in horizontal rows around the crown. These grooves or pits extend into the enamel as far as the dentinoenamel junction. The defect may be a lack of development of all or part of the enamel, leaving exposed dentin.

Figure: 1. Enamel hypoplasia.

NOTE: *Interruption of the enamel developmental process results in irregular enamel formation or lack of enamel formation. Restorative treatment may be required because of susceptibility to decay and to improve appearance.*

Causes of enamel hypoplasia:

Hypoplastic enamel and poorly formed dentin can be attributed to various causes or combinations of causes, such as infectious diseases (scarlet fever, measles, pneumonia), rickets, or hereditary factors. Trauma to primary teeth may cause a localized hypoplastic defect in a developing permanent tooth (called Turner's tooth).

Turner's hypoplasia

Turner's hypoplasia is an abnormality found in teeth. Its appearance is variable, though usually is manifested as a portion of missing or diminished enamel on permanent teeth. Unlike other abnormalities which affect a vast number of teeth, Turner's hypoplasia usually affects only one tooth in the mouth and, it is referred to as a Turner's tooth.

If Turner's hypoplasia is found on a canine or a premolar, the most likely cause is an infection that was present when the primary (baby) tooth was still in the mouth. Most likely, the primary tooth was heavily decayed and an area of inflamed tissues around the root of the tooth (called a periapical inflammation), affecting the development of the permanent tooth. The tooth most likely affected by this cause is the canine tooth. The appearance of the abnormality will depend on the severity and longevity of the infection.

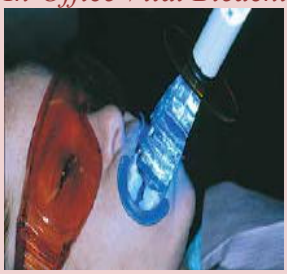
If Turner's hypoplasia is found in the front (anterior) area of the mouth, the most likely cause is a traumatic injury to a primary tooth. The traumatized tooth, which is usually a maxillary central incisor, is pushed into the developing tooth underneath it and consequently affects the formation of enamel. Because of the location of the permanent tooth's developing tooth bud in relation to the primary tooth, the most likely affected area on the permanent tooth is the facial surface (the side closer to the lips or cheek). White or yellow discoloration may accompany Turner's hypoplasia. Enamel hypoplasia may also be present.

Turner's hypoplasia usually affects the tooth enamel if the trauma occurs prior to the third year of life. Injuries occurring after this time are less likely to cause enamel defects since the enamel is already calcified.

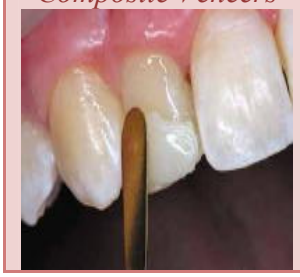
Treatment:

Prevention is much better than treatment. A physician who provides good health supervision (including proper treatment of infant disease) and good nutrition are the keys to prevention.

TREATMENT OF SUPERFICIAL ENAMEL DISCOLORATION

TREATMENT	ACTIVE AGENT	INDICATIONS FOR USE	POTENTIAL PROBLEMS
In-Office Vital Bleaching 	*Hydrogen peroxide 30-38% is applied directly on the teeth. A special light may also be used to accelerate the whitening process.*	*When there are only a few discolored teeth.*	*Temporary tooth sensitivity. Gingival irritation.*
Overnight Vital Bleaching 	*Carbamide peroxide 10% is used in a custom tray.*	*When there are multiple discolored teeth. Effective for yellow, orange, or light-brown discoloration in primary and permanent teeth.*	*Temporary tooth sensitivity in 55-75% of cases.*
Whitening Strips 	*Hydrogen peroxide 6.5% or 14% is delivered via a thin, flexible polyethylene strip.*	*Multiple discolored teeth. Works slightly better on upper than lower teeth.*	*Temporary tooth sensitivity and oral tissue irritation.*

TREATMENT OF DEEP ENAMEL DISCOLORATION

TREATMENT	*ACTIVE AGENT*	*INDICATIONS FOR USE*	*POTENTIAL PROBLEMS*
Etch, Bleach, and Seal technique 	*Phosphoric acid 37%, sodium hypochlorite 5%, and clear sealant.*	*Shallow yellow-brown enamel discolorations.*	*Does not remove stains which are deeper than a few tenths of a millimeter.*
Microabrasion with Dental Bleaching 	*Abrasive slurry consisting of silicon carbide and hydrochloric acid 11%.*	*Isolated brown or white discolorations with shallow depth.*	*May not be able to remove the stain completely.*
Composite Veneers 	*Dental composite.*	*Deep tetracycline stains.*	*A layer of enamel must first be removed from the surface of the tooth.*