DEVELOPMENTAL DISTURBANCES

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ENAMEL HYPOPLASIA

- Enamel hypoplasia may be defined as an incomplete or defective formation of the organic enamel matrix of teeth.
- Two basic types : (1) a hereditary type(amelogenesis imperfecta), and (2) a type caused by environmental factors.
- In the hereditary type, both the deciduous and permanent dentitions usually are involved and generally only the enamel is affected.
- In contrast, when the defect is caused by environmental factors, either dentition may be involved and sometimes only a single tooth; both enamel and dentin are usually affected, at least to some degree.

ENVIRONMENTAL ENAMEL HYPOPLASIA

- A number of different factors, each capable of producing injury to the ameloblasts, may give rise to the condition, including:

(1) nutritional deficiency (vitamins A, C, and D)

(2) exanthematous diseases (e.g. measles, chickenpox, scarlet fever)

(3) congenital syphilis

(4) Hypocalcemia

(5) birth injury, prematurity, Rh hemolytic disease

(6) local infection or trauma

(7) ingestion of chemicals (chiefly fluoride)

(8) idiopathic causes.

- In mild environmental hypoplasia, there may be only a few small grooves, pits, or fissures on the enamel surface
- If the condition is more severe, the enamel may exhibit rows of deep pits arranged horizontally across the surface of the tooth.
- In the most severe cases, a considerable portion of enamel may be absent, suggesting a prolonged disturbance in the function of the ameloblasts.

HYPOPLASIA DUE TO NUTRITIONAL DEFICIENCY AND EXANTHEMATOUS FEVERS

- rickets during the time of tooth formation is the most common known cause of enamel hypoplasia.
- Deficiencies of vitamin A and C have also been named as causes.
- exanthematous diseases, including measles, chickenpox and scarlet fever, are etiologic factors

ENAMEL HYPOPLASIA DUE TO CONGENITAL SYPHILIS

- This hypoplasia involves the maxillary and mandibular permanent incisors and the first molars.
- The anterior teeth affected are sometimes called ‘Hutchinson’s teeth,’ while the molars have been referred to as ‘mulberry molars’ (Moon’s molars, Fournier’s molars).
- The upper central incisor is ‘screw-driver’ shaped, the incisal edge is usually notched

ENAMEL HYPOPLASIA DUE TO HYPOCALCEMIA

- Tetany, induced by a decreased level of calcium in the blood, may result from several conditions, the most common being vitamin D deficiency and parathyroid deficiency (parathyroprivic tetany).
- In tetany the serum calcium level may fall as low as 6–8 mg per 100 ml, and at this level enamel hypoplasia is frequently produced in teeth developing concomitantly.
- This type of enamel hypoplasia is usually of the pitting variety and thus does not differ from that resulting from a nutritional disturbance or exanthematous disease.

HYPOPLASIA DUE TO BIRTH INJURIES

- The neonatal line or ring present in deciduous teeth and first permanent molars, may be thought of as a type of hypoplasia
- enamel hypoplasia is far more common in prematurely born children than in normal term infants

ENAMEL HYPOPLASIA DUE TO LOCAL INFECTION OR TRAUMA

- A type of hypoplasia occasionally seen is unusual in that only a single tooth is involved, most commonly one of the permanent maxillary incisors or a maxillary or mandibular premolar
- mild, brownish discoloration of the enamel to a severe pitting and irregularity of the tooth crown.
- These single teeth are frequently referred to as 'Turner's teeth,' and the condition is called 'Turner's hypoplasia.'

ENAMEL HYPOPLASIA DUE TO FLUORIDE: MOTTLED ENAMEL

- Ingestion of fluoride containing drinking water during the time of tooth formation may result in mottled enamel. The severity of the mottling increases with an increasing amount of fluoride in the water.

Treatment :

- For cosmetic reasons, it has become the practice to bleach the affected teeth with an agent such as hydrogen peroxide.
- This is frequently effective, but the procedure must be carried out periodically, since the teeth continue to stain.

HYPOPLASIA DUE TO IDIOPATHIC FACTORS

- clinical studies have shown that, even with careful histories, the majority of cases are of unknown origin.
- Since the ameloblast is a sensitive type of cell and easily damaged, it is likely that in those cases in which the etiology cannot be determined, the causative agent may have been some illness or systemic disturbance so mild that it made no impression on the patient and was not remembered

DENTINOGENESIS IMPERFECTA

SHIELDS CLASSIFICATION

- TYPE I:OCCURS IN PATIENTS AFFECTED WITH OSTEOGENESIS IMPERFECTA
- TYPE II :IS NOT ASSOCIATED WITH WITH OSTEOGENESIS IMPERFECTA
- TYPE III:"BRANDYWINE TYPE" RARE CONDITION ,SEEN IN RACIAL ISOLATE OF MARYLAND,EXHIBITS MULTIPLE PULP EXPOSURES AND PERIAPICAL LESIONS IN DECIDOUS DENTITION.

Dentinogenesis imperfecta

(Hereditary opalescent dentin)

- Classification of DI : (Shields)

Type I	: DI + OI (osteogenesis imperfecta)	***COL1A1, COL1A2***
Type II	: Isolated DI. (1/8000)	***DSPP***
Type III:	DI of the Brandywine type *	***DSPP***

- A racial isolate in Maryland,
- DI + multiple pulp exposures in deciduous teeth

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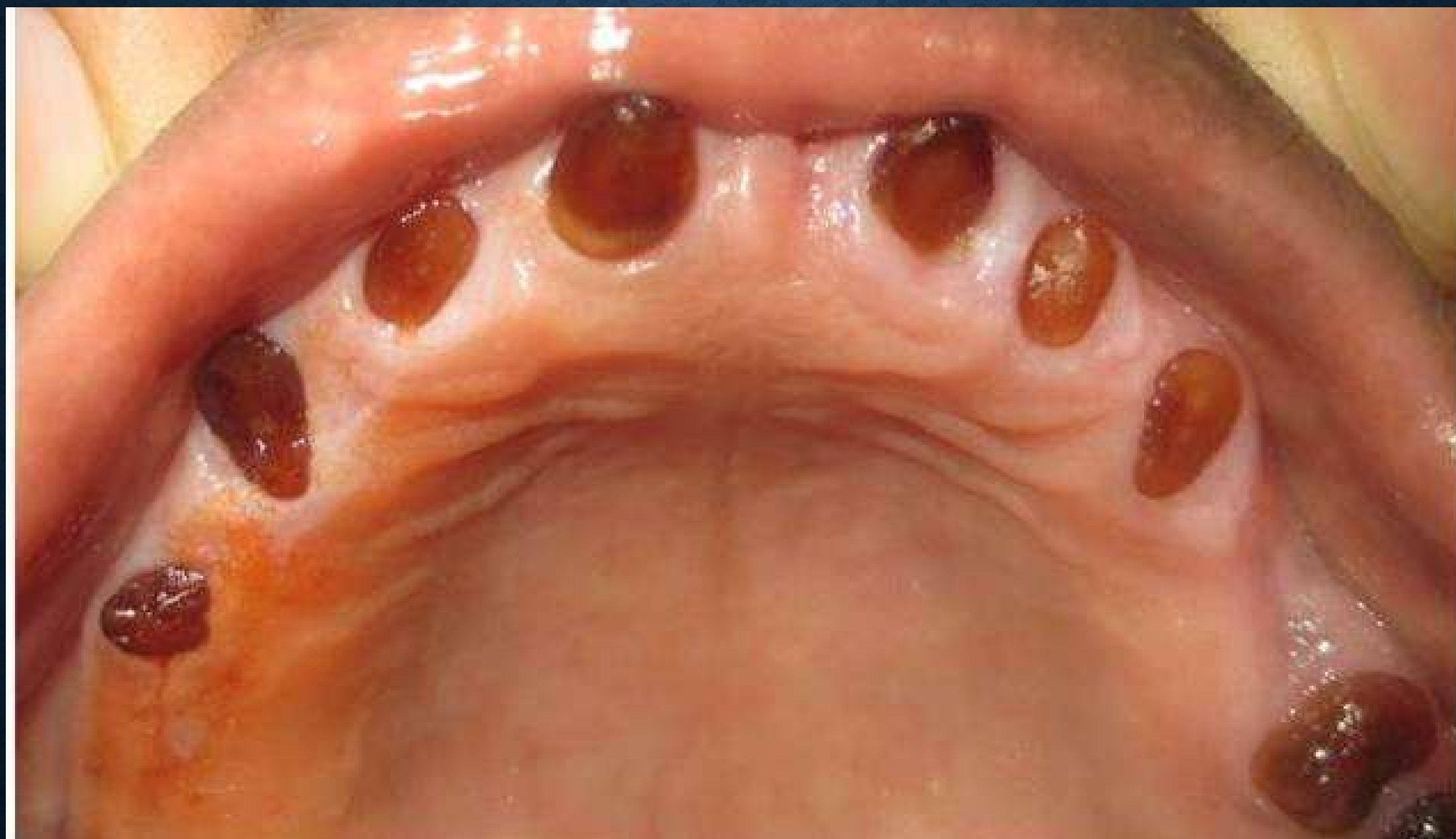
Shields[5]	Witkop[6]	REvised[7,8]	Clinical presentation
DI-I	DI	No substitute	Osteogenesis imperfecta with opalescent teeth
DI-II	Hereditary Opalescent Teeth	DI-I	Isolated opalescent teeth
DI-III	Brandywine isolate-found only in a population of southern Maryland (USA)	DI-II	Isolated opalescent teeth

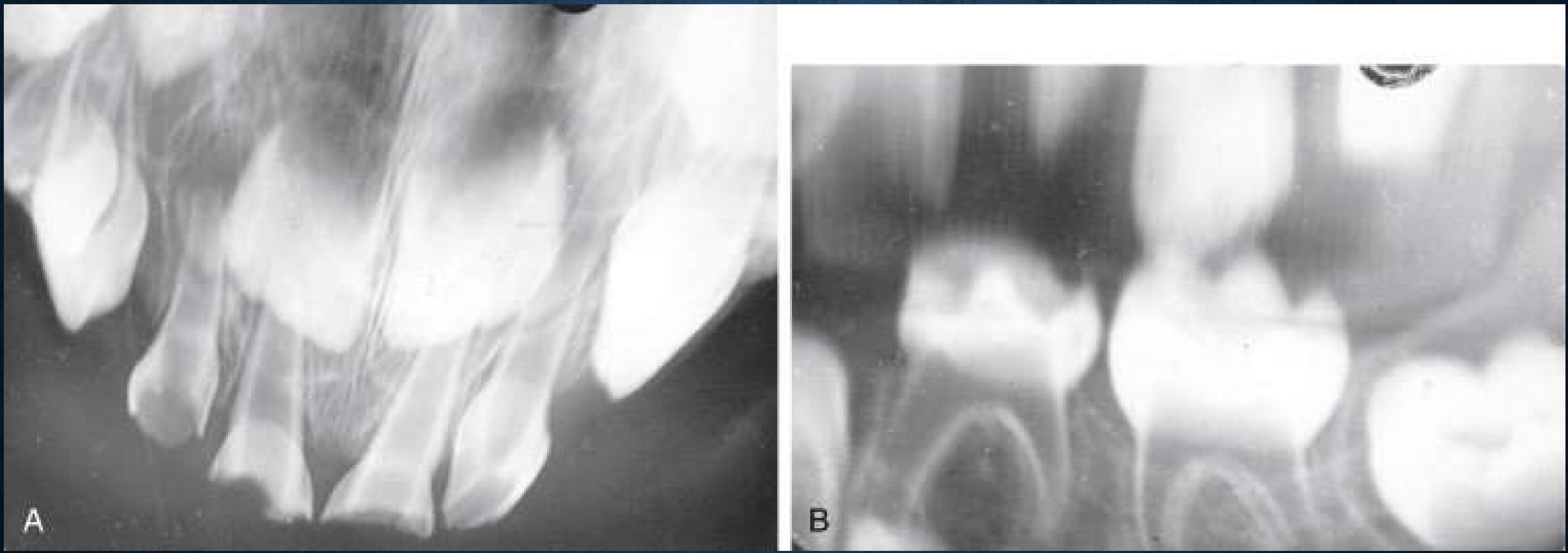
DI: Dentinogenesis imperfecta

Classification	Aetiology	Clinical Manifestations
DGI type I (Shields) or DGI associated with OI	Mutation in *COL1A1* and *COL1A2* gene	Amber and translucent teeth with attrition in primary and secondary dentition
DGI type II (Shields) or moderate form	Mutation in *DSPP* gene	Bulbous crowns with marked cervical constriction
DGI type III (Shields) or severe form	Mutation in *DSPP* gene	Variable clinical features, resembling those in DGI type I and II

Fig. 18.1. Dentinogenesis imperfecta Shields type I.

DI TYPE 2

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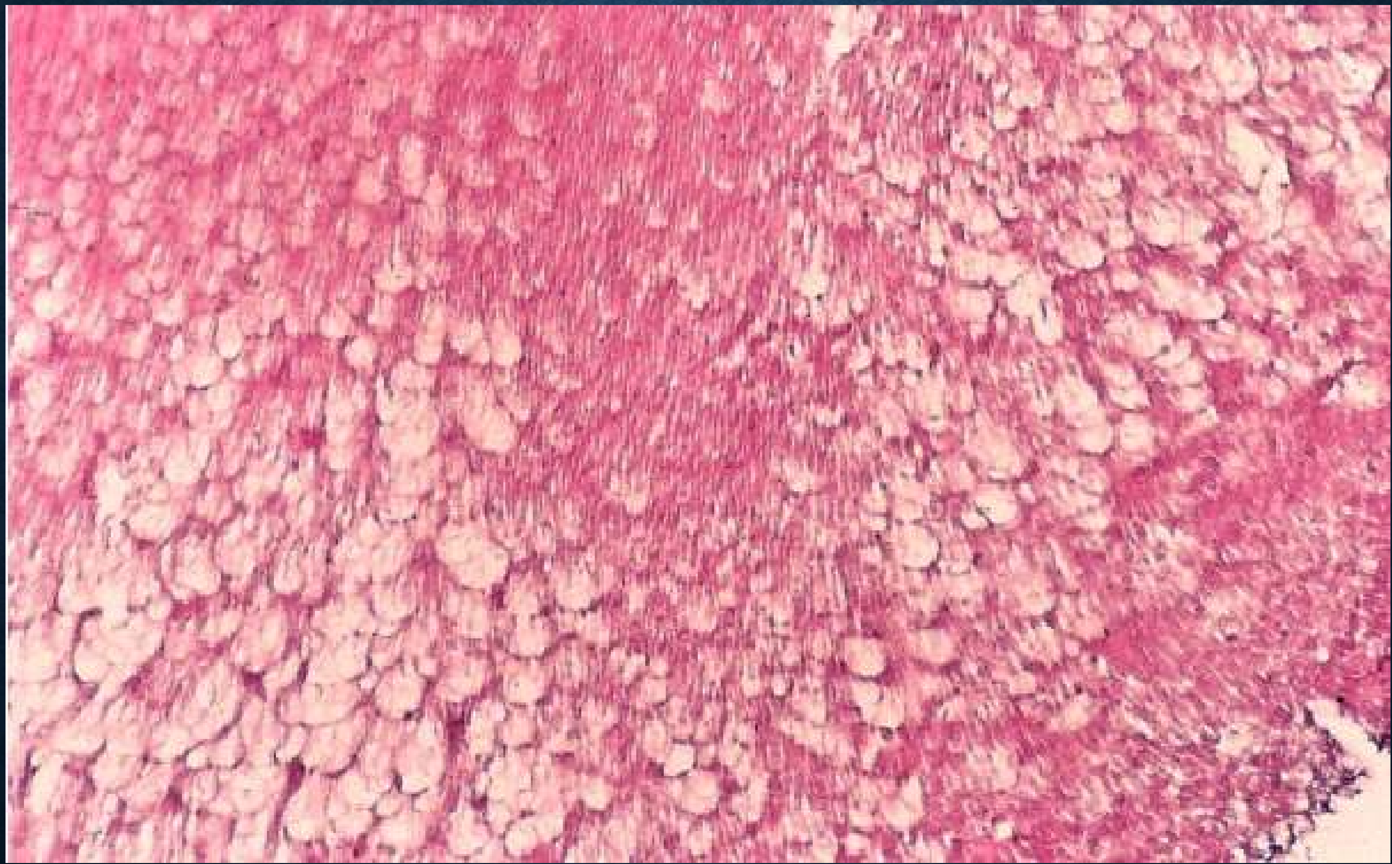
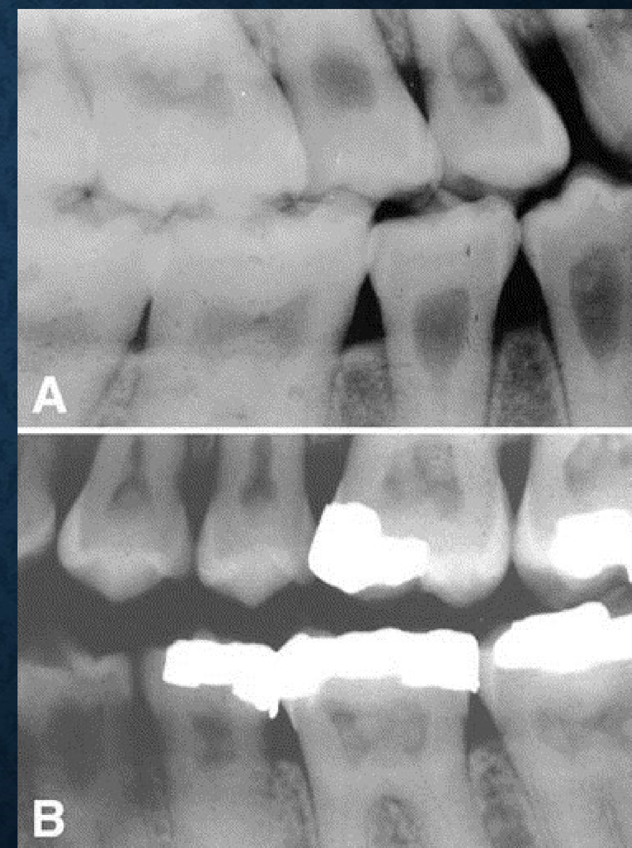
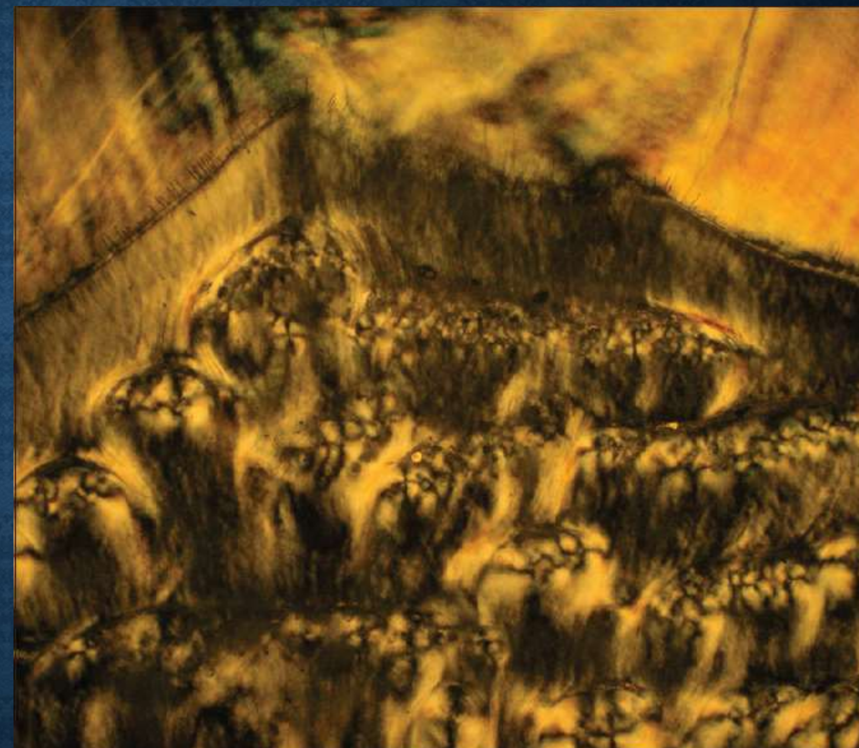


DENTIN DYSPLASIA (ROOTLESS TEETH)

DENTIN DYSPLASIA TYPE 2



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REGIONAL ODONTODYSPLASIA

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