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DENTIN DYSPLASIA TYPE 1

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Abstract: Dentin dysplasia is a rare disturbance of dentin formation characterized by normal enamel but atypical dentin formation with abnormal pupal morphology. The teeth appear clinically normal in morphologic appearance and color. The teeth characteristically exhibit extreme mobility and are commonly exfoliated prematurely. Radiograph shows obliteration of all pulp chambers, short, blunted and malformed or absent roots with periapical radiolucencies involving apparently intact tooth. This case is reported here because of its rarity along with the description of various clinical, radiological and histological features.

IndexTerms: Dentin dysplasia type 1

I. *Introduction*

- Dentin is a mineralized tissue constituting the body of a tooth, serving as a protective covering for the pulp and as a support for overlying enamel and cementum. Dentin dysplasia is an autosomaldominant trait, affecting either the primary or both the primary and secondary dentitions for approximately one patient in every 100,000. [1,2]
- Dentin dysplasia was first reported in 1922 by Ballschmiedel who described six children in one family whose teeth had short, blunted roots with pulpal occlusion that he called “rootless teeth”. [3,4]
- Generally, two main classes of dentin dysplasia are recognized based on clinical and radiographic appearance. Shields et al., [5] proposed the classifications type I, or “dentin dysplasia,” and type II or “anomalous dysplasia of dentin.” Witkop [2] later described type I as “radicular dentin dysplasia” and type II as “coronal dentin dysplasia” [6] to indicate the parts of the teeth that are primarily involved. Eastman et al., in 1977 and Ciola et al., [7] in 1978 described two conditions for which they suggested the name “dentin dysplasia type III.”

II. *Clinical features*

In type I (radicular) dentin dysplasia, both primary and permanent dentitions are affected, although the teeth are in normal morphologic appearance and color. The teeth characteristically exhibit extreme mobility and are commonly exfoliated prematurely. In type II (coronal), both the dentitions are affected; however, the deciduous teeth have a bluish or amber discoloration, while the permanent dentition appears normal. Primary teeth show total pulp obliteration and permanent teeth show thistletube pulp configuration and pulp stones in pulp chambers. [8]

III. *Radiographic features*

Radiographically, in dentin dysplasia type I, the roots are sharp with conical, apical constrictions. Preeruptive pulpal obliteration occurs leading to a crescentshaped pulpal remnant and total pulpal obliteration in the deciduous teeth.In type II, the pulp chambers and root canals are shaped like a thistle tube with an accumulation of pulp stones with no periapical radiolucencies. [9]

IV. *Discussion*

- Dentin dysplasia is rarely seen in children, the occurrence is 1 in 100,000. There are some systemic disorders that are associated with dentindysplasialike alterations but no such findings were found in this patient on general and radiological examination. condition, [12] [10,11] It is usually an autosomal dominant but in our patient there was no familial history of the disease, so she can be considered as a first generation sufferer.The etiology of dentin dysplasia type I remain speculative. Logan et al., [13] proposed that the dental papilla is responsible for the abnormalities in root development. They suggested that multiple degenerative foci within the papilla become calcified, leading to reduced growth and final obliteration of the pulp space. Sauk et al., in a scanning electron microscope study, postulated that dentin dysplasia is a defect in the epithelial component of the developing tooth germ in which the invagination of the root sheath occurs too

soon and, in a sequence of futile attempts to correct itself, results in a stunted root form with an unusual whorl like pattern of dentin obliterating the pulp chambers. [14]

- Wesley et al., [15] disagreed with this suggestion and proposed that the condition is caused by an abnormal interaction of odontoblasts with ameloblasts leading to abnormal differentiation and/or function of these odontoblasts. Witkop [16] suggested that the dysplasia results from epithelial cells from the sheath of Hertwig breaking off and migrating into dental papilla, where they induce odontoblast differentiation and dentin formation. Melnick et al., [17] suggested that the abnormal root morphology is caused by abnormal differentiation and/or function of the odontoblasts. Clearly, the exact etiology of dentin dysplasia has yet to be explored.
- Systemic diseases correlated with dentin dysplasia like alterations [10,12]
- Dentin dysplasia type I should be differentiated from other conditions like dentin dysplasia type II, dentinogenesis imperfecta and odontodysplasia . [11] In our patient, normal morphology of crown, short, blunted and malformed roots with pulpal obliteration and periapical radiolucency and ground section revealing “stream flowing around boulders” are characteristic for diagnosis of dentin dysplasia type I. There were no morphological variation in the dentition of our patient but there are reports that have suggested possible variations in the morphology of teeth affected by this type of dysplasia. [18,19]

V. Treatment

Management of patients with dentin dysplasia has posed several problems to the dentists. Extraction has been suggested as a treatment alternative for teeth with pulp necrosis and periapical abscess. Endodontic treatment is contraindicated in teeth with total obliteration of root canals and pulp chambers. [20] Another approach for the treatment of teeth with dentin dysplasia has included peri surgery and retrograde filling, which is recommended in teeth with long roots. [21,22] Follow-- apical up and routine conservative treatment is another choice of treatment plan in dentin dysplasia. [21] Orthodontic treatment is suggested; however, further resorption of the roots, loosening of teeth and premature exfoliation may occur due to the resistance of the short roots to the orthodontic forces. [23] Successful oral rehabilitation with complete denture after extraction of all teeth and curettage of cysts has also been proposed. [24] Since these patients usually have early exfoliation of the teeth and consequently, maxillomandibular bony atrophy, treatment with a combination of onlay bone grafting and a sinus lift technique to accomplish implant placement can be used successfully. [25]

VI. Conclusion

Dentin dysplasia type I is an unusual abnormality of dentin which leads to premature exfoliation of the teeth. The treatment of children with dentin dysplasia aims in effective preventive care as because of the early loss of teeth due to shortened roots and periodontitis. So, meticulous oral hygiene measures and dietary instructions must be established and maintained for the retention of teeth to help children have natural teeth as long as possible. In this regard, dentist has an important role in early diagnosis of this disorder and in guiding patients in the selection of measures to prolong the retention of affected teeth.

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