

MULTIPLE DENS EVAGINATUS- A RARE CASE REPORT WITH A REVIEW OF LITERATURE

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ABSTRACT: Densevaginatus (DE) is a developmental disturbance affecting the shape of the teeth which is characterized by the presence of accessory enamel projections along with dentin and pulpal core on the occlusal or lingual surface of the teeth. It affects both the primary and permanent dentition. The clinical intendment is focused on early pulpal exposure due to occlusal trauma, fracture or attrition leading to infection. Treatment may be conservative or interventional. The occurrence of DE either isolated or conjoined with other dental anomalies has been reported. This article presents with a case report of conjoined occurrence of multiple DE (Schulge type 5) along with partial anodontia of maxillary premolars and left molars and also reviews the etiology, classification, diagnosis and management strategies of the teeth with DE.

KEYWORDS: Dens evaginatus, DE, hamartomatous, evaginated odontome

INTRODUCTION

The disturbances in the early stage of teeth development will lead to alteration in the shape of the teeth resulting in anomalies. The dens evaginatus is one such developmental anomaly of teeth that presentson the occlusal surface or cingulum area of teeth as accessory cusps or enamel globules¹and is composed of enamel, dentin core usually enclosing the pulpal tissue.² It was first described by Mitchell in 1892 but the terminology was recommended by Oehler.It may affect both the primary and permanent dentitions either unilaterally or bilaterally³ and may be localized or generalized.According to literature review, the prevalence of these cusp like projections are more in molars as cusp of Carabelli (68%) followed by Leong's premolars (8%) and the Talon's cusp of incisors (1-7.7%).⁴ The occurrence may be isolated or concomitant with other dental anomalies such as supernumerary teeth, anodontia, Dens invaginatus, etc³ Partial anodontia or agenesis of teeth is the congenital absence of one or more teeth. According to literature reviews, most commonly missing teeth are the third molars followed by maxillary lateral incisors and the second premolars, often bilaterally.¹

Both agenesis of teeth and Dens evaginatus can be diagnosed by clinical and radiographic appearances. Very few cases of multiple dens evaginatus have been reported in the literature so far. This case report of multiple dens evaginatus involving maxillary and mandibular premolars, molars and canine along with partial anodontia of maxillary premolars therefore comes up as a unique and rare addition to the literature archive.

CASE REPORT:

A 23-year-old male patient reported to the outpatient department of Oral medicine and Radiology with the chief complaint of missing teeth in the left upper back teeth region. Patient presented with the history of missing left upper back teeth since the exfoliation of his primary teeth. The medical and the family history of the patient were found to be noncontributory. General physical and extra oral examinations did not show any abnormality except for the presence of mild facial asymmetry in the form of a depression on the left upper third of his face near the malar region.

Intraoral examination revealed mild gingivitis with the other soft tissues appearing normal in color, contour and consistency. An intraoral hard tissue examination revealedabsence of maxillary left first premolar, second molar and maxillary second premolars bilaterally. There was a tapered maxillary arch with reduced over jet, incisors showing edge-to-edge biteand posterior crossbite ((Fig.1, Fig.2 and **Fig.3**) present. There was a physiological drifting of maxillary left canine distally and molar mesially. The molars presented with multiple accessory cusps on their occlusal surface, showing attrition and the premolars presented with Leong's tubercle (Fig.1 and Fig.2), which resulted in interference in occlusion leading to a premature contact with their antagonists. The maxillary and mandibular incisors were shovel-shaped with prominent lateral margins which encloses the lingual/palatal surface. However, none of the teeth were symptomatic in terms of sensitivity.



Fig.1: Maxillary arch exhibiting multiple Dens Evaginatus



Fig.2: Mandibular arch exhibiting multiple Dens Evaginatus



Fig.3. Occlusal status of the patient - Right and Left occlusal views



Fig.4: Intraoral Periapical radiograph showing multiple Dens evaginatus



Fig.5: Panoramic radiograph showing multiple Dens evaginatus and partial anodontia

The patient was advised for radiological investigations which included a set of full mouth Intra Oral Periapical Radiographs (Fig.4.) followed by extraoral radiographs like Panoramic (OPG) and Postero-Anterior skull (PA) view. The OPG (Fig.5) revealed absence of maxillary second premolar, left first premolar, second and third molars and mandibular third molars. In addition to this, there was presence of tuberculate premolars and multiple extra cuspal projections on the molars.

Correlating the clinical and radio graphical features, the condition was diagnosed as **Densevaginatus of posterior teeth- Schulge type 5** with shovel-shaped incisors and partial anodontia involving the maxillary arch.

The patient was advised for prosthetic rehabilitation of his missing teeth and for interventional treatments such as occlusal correction and preventive restorations. Since the patient was not concerned about esthetics and occlusal discomfort he was not willing for any interventional treatment however, he has been kept on regular follow ups.

DISCUSSION:

Dens evaginatus is the cuspal projection of enamel in the central groove or lingual ridge of the buccal cusp of permanent premolar or molar teeth. It is also called as evaginated odontome,^{1,5} occlusal enamel pearl¹, the central tubercle or supernumerary occlusal cusp. It is most common in mandibular premolars called as Leong's premolar, occurring bilaterally although seen as accessory cusps on the occlusal surface molars. It is also seen in

anterior teeth on the lingual aspect extending from the cemento-enamel junction up to the incisal edge and called as Talon's cusp.⁶ Currently Dens evaginatus is used as a generalized terminology to describe the talon's cusp, Leong's premolar or occlusal enamel pearl and was first recommended by Oehlers⁷ in 1967. It is considered as a hamartomatous growth of odontogenic apparatus⁸ comprising of enamel with a dentin core and mostly with pulpal extension. Dens evaginatus varies widely in shape (horn-like, conical or pyramidal), size, structure, location, and site of origin. It can occur bilaterally and affects both primary and permanent dentition.³ It is more common among mongoloid race, about 15% Asians and rare among whites.⁸

DE occurs in the early stages (bell stage) of tooth development before the mineralization of hard tissues. It results from the outward folding of the inner enamel epithelial layer into the stellate reticulum of the enamel organ and transient focal hyperplasia of the primitive pulpal mesenchyme during the morphodifferentiation stage of the tooth development.¹ The etiology of dens evaginatus is still unknown, even though various hypotheses have been put forward.³ Both environmental and genetic factors are said to be involved in the etiological process. The genetic factors may be due to mutations in various genes like human EDA1 (Ectodysplasin A), EDAR (Ectodysplasin A receptor), and EDARADD (Ectodysplasin A receptor associated death domain) genes that leads to altered tooth morphology.⁹ The enamel knots which are the central regulators of teeth development, due to accumulation of certain molecules such as fibroblast growth factors (FGF-

4, FGF-9), transforming growth factor β , and bone morphogenic proteins (BMP-2, 4,7) may also lead to formation of accessory cusps.¹⁰

According to literature reviews, shovel-shaped incisors,^{5,11} supernumerary teeth,¹¹ agenesis of teeth¹¹, impacted teeth and odontomas³ are the other common anomalies of teeth seen most frequently in association with dens evaginatus. Among these, the features which were present in our case as highlighted above includes shovel-shaped incisors and agenesis of teeth. The shovel-shaped incisors present with a thickened marginal ridge enclosing the central groove in the lingual surface resembling the scoop of shovel.¹¹ Partial anodontia or agenesis of teeth is the congenital absence of one or more teeth. Most common missing teeth are the third molars followed by maxillary lateral incisors and the second premolars, often bilaterally.¹² In this case maxillary second premolar, left first premolar, second and third molars and mandibular third molars were missing thus correlating with the literature.

The bulk of the dens evaginatus can cause occlusal interference causing traumatic occlusion and may cause pain in the periodontal ligament secondary to the occlusal trauma and also temporomandibular joint pain. They have deep developmental grooves sometimes extending into the pulp thereby leading to accumulation of plaque and early progression to dental caries.¹³ In the present case however, none of the teeth showed dental caries.

Even though DE is not essential component of any specific syndrome, it is seen in association with Rubinstein-Taybi Syndrome,¹⁴ Mohr Syndrome (oral-facial-digital II Syndrome),¹⁵ Sturge-Weber Syndrome (encephalo-trigeminal angiomas),¹⁶ and Ellis-van-Creveld Syndrome.¹⁷

Based on the location of the accessory cuspal tubercles on the posterior teeth, Schulge in 1987 classified DE into 5 types:

1. A cone-like enlargement of the lingual cusp
2. A tubercle on the inclined plane of the lingual cusp
3. A cone-like enlargement of the buccal cusp
4. A tubercle on the inclined plane of the buccal cusp
5. A tubercle arising from the occlusal surface obliterating the central groove.

Based on the anatomical shape of the tubercle Lau classified as smooth, grooved, terraced and ridge. However, Oehler classified DE based on the histological appearance of the pulp content within the tubercle as wide pulp horns (34%), narrow pulp horns (22%), constricted pulp horns (14%), isolated pulp horn remnants (20%), no pulp horn (10%).³ Schulge type 5 was observed in the above discussed case.

Radiographically, DE will be visualized as radiopaque projections on occlusal surface with differing radio dense structures of enamel, dentin along thin slender radiolucent pulpal component. The IOPARs and OPG aided in the visualization of the above features for the present case.

Clinical management of these dental anomalies varies from patient to patient presentation. Interventional treatment modalities such as coronoplasty, occlusal corrections, application of desensitizing fluorides¹⁸ and prosthetic rehabilitation can be done. When the affected teeth are fractured or attrited causing pulpal exposure, endodontic treatment methods should be followed.

CONCLUSION:

Early diagnoses and management of dental anomalies are very important for the functional and esthetic considerations of the patients specially in rare conditions as highlighted in this case report. Systemic involvement should be ruled out. Multidisciplinary treatment protocol along with regular follow ups should be done.

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