

Double facial talons on maxillary incisor—A rare case report and new proposed classification system

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Abstract

Background: Double facial talon's cusp is a rare developmental anomaly affecting the deciduous or/and permanent dentition. The major complications associated with facial talons of maxillary incisors include poor esthetic appearance with increased susceptibility to caries and, sometimes, even soft tissue irritation, thereby needing early detection and precise management.

Case Report: We report a case of a 10 year-old female patient with a large double talon's cusp on the permanent left maxillary central incisor who presented with issues of soft tissue irritation and esthetic concern. One of the highlighting feature of this documented case was the difference in the extent of both talon's cusps on the facial surface of 21 teeth. As per Mayes' classification system, the talon towards the midline belonged to stage 2 and the talon away from the midline belonged to stage 3.

Highlights: Based on the previous literature search on classification systems, we intended to propose a new classification system for double facial talons depending on their size (equal/unequal) and presence of developmental grooves (separate or fused). The aim of this new classification system is to enlighten a new area of research that can be conducted on the treatment aspect by studying the difference in the structure of enamel rods, dentin, especially in case of double talons of unequal size (as the direction of enamel rods/dentinal tubules of the talons with that of the direction of enamel rods/dentinal tubules of the underlying tooth will vary) and their compatibility with choice of dental materials, to be used for proper adaptation and develop new treatment protocols of tooth preparation and restoration for such cases.

Keywords: Double tooth, eagle's talon, facial talon's cusp, maxillary central incisors, new classification system, permanent dentition

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INTRODUCTION

Traced back to historiography, in 1892, Mitchell first described this developmental anomaly. Later, in 1970, Mellor and Ripa coined the term as talon's cusp due to its resemblance to eagle's claws.^[1,2] In the same

preceding year, Gorlin and Goodman defined talon's cusp as a 'high accessory cusp reaching the incisal edge to produce a T-form or a Y-shaped tooth crown'.^[3] Being revised in 2005, the latest definition of talon's cusp is

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'accessory cusp on the lingual or labial aspect of incisors or canines'.^[4]

The development of this concealed anomaly is thought to be due to the outward folding of inner enamel epithelial cells, that is, preamleoblast cells during the morpho-differentiation stage of tooth development or due to transient focal mesenchymal hyperplasia.^[5] Various synonyms such as supernumerary cusp, dens evaginatus, cusped/hyperplastic cingulum, and evaginated odontome have also been documented.^[6] Several evidence-based studies have inferred the varied geographic occurrence of this anomaly ranging from 0.6% in Mexicans, 2.4% in Jordanians, 2.5% in Hungarians, 5.2% in Malaysians, 7.7% in north Indians, and 19.35% in South Indian populations.^[7-9] Among the gender predilection, males (67.3%) were more commonly affected than females (32.7%) in case of lingual talon and vice versa in case of facial talon.^[10,11] The maxillary arch was more commonly affected than the mandibular arch, with highest predilection for maxillary lateral incisors (67%), followed by the maxillary central incisors (24%) and canines (9%).^[12]

One of the major complications associated with facial talon of maxillary incisors includes poor esthetic appearance. Moreover, the increased susceptibility to caries due to ill-defined grooves at the junction with a normal tooth surface, accidental fracture of cusp, periodontal problems, and sometimes even soft tissue irritation have emphasized on the need for early detection and precise treatment.^[13]

In the current article, we report a rare case of a 10 year-old female patient with a large double talon's cusp on the permanent left maxillary central incisor who presented with issues of soft tissue irritation and esthetic concern. One of the highlighting features of this documented case was the difference in the extent of both talon cusps on the facial surface of 21 teeth. Based on this background and previous literature search, we proposed a new classification system (described in the Discussion part). As per Mayes' classification system, the present case belongs to stage 2 and stage 3.

CASE REPORT

A healthy-looking, 10 year-old female patient presented to the outpatient department with a complaint of large, unusual-looking front tooth in the upper front region of the mouth as shown in Figure 1. On detailed anamnesis, no significant abnormalities were documented. Past family history revealed no finding of a similar dental abnormality or consanguinity of the patients' parents. Intraoral



Figure 1: Clinical picture demonstration of double talons on the facial surface of 21 teeth

examination revealed a mixed dentition phase with normal shedding and eruption cycle of each tooth as informed by the accompanied parent. The associated tooth erupted at about 7 years 3 months' time without any complications. The oral hygiene of the patient was pretty fair with class I molar relationship and slight crowding of the lower anteriors. The fully erupted anomalous permanent maxillary central incisor tooth on the left side presented with a large crown and two unequally sized and shaped cusp-like projections on the labial aspect, each measuring about 5 mm × 3.5 mm × 4 mm in its greatest dimension, resembling an eagle's talon. Being well developed, the cusps extended from the cemento-enamel junction to the middle third of the crown, unequal in shape and size and well separated from each other. As per Mayes' classification, we classified them as stage 2 (towards the mesial aspect) and stage 3 (towards the distal aspect). The accessory cusps appeared as V-shaped tubercles with a smooth surface when viewed incisally. On the lingual aspect, no such accessory cusp was seen. The tooth responded normally to pulp testing. The cusps did not interfere with occlusion. However, the patient has slight discomfort while smiling due to friction of these cusps with the labial soft tissue mucosa of lips.

Intraoral periapical radiographic findings revealed two accessory cusps with normal enamel, dentin, pulp chambers, and root canals, which were separated by the deep developmental groove. The cusps exhibited a double V-shaped radio-opaque structures pointing towards the incisal edge, as shown in Figure 2. Based upon clinical and radiographic findings, a diagnosis of double facial talon's cusp associated with the permanent left maxillary central incisor was made. The only differential diagnosis considered was dens invaginatus that was ruled out by

radiographic presentation of both cusps having separate pulp chambers and canals and the classic appearance of a cusp-like projection on clinical picture, which was more representative of talon's cusp. One of the highlighting features of this documented case was the difference in the extent of both talon's cusp on the facial surface of 21 teeth. As per Mayes' classification system, the talon towards the midline belonged to stage 2 and the talon away from the midline belonged to stage 3. Based on the clinical and radiographic findings, the treatment was directed towards eliminating the double talons. The alginate impression model was made on the first visit, as shown in Figure 3. Unfortunately, the patient failed to return after the first visit.

DISCUSSION

The development of this concealed anomaly is thought to be due to the outward folding of inner enamel epithelial cells, that is, preamleoblast cells during the morpho-differentiation stage of tooth development or due to transient focal mesenchymal hyperplasia.^[5] However, various other factors such as genetic, environmental, intrauterine, nutritional, systemic conditions, trauma, hypervitaminosis A, thalidomide embryopathy, and viral infection during pregnancy have also contributed, thereby making this anomaly a multifactorial origin.^[5] This condition is also more prevalent in patients with Rubinstein–Tyabi syndrome, Mohr syndrome (oral facial: digital II syndrome), Sturge–Weber syndrome (encephalotrigeminal angiomas), Allagille's syndrome, and Berardinelli–Seip syndrome.^[5,14] There was no such association seen in the present case, thereby considering it as a non-syndromic type.

Way back in 1996, Hattab *et al.*^[5] classified it into three types based on its degree of cusp formation, extension,

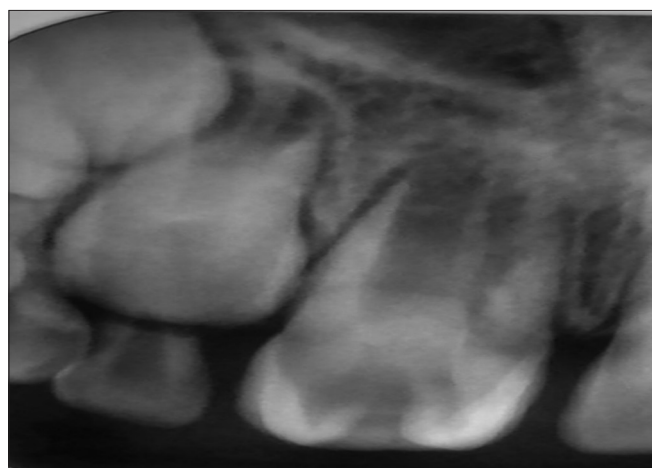


Figure 2: Intraoral periapical (IOPA) Radiograph showing V-shaped inverted radio-opaque structures pointing towards the incisal edge separated from deep groove

and its morphological characteristics as talon, semi-talon, and trace talon. In 2001, Hsu *et al.* classified talons cusps as follows: major talons, minor talons, and trace talons.^[15] In 2007, Mayes classified facial talon cusps into three stages based on their severity as slightest to most-extreme forms as stage 1, stage 2, and stage 3.^[16] The reason and difference in presentation of this anomaly and its appearance on different surfaces of tooth lead to the various above-mentioned classification systems. In the present case, as per Mayes' classification, stage 2 and stage 3 type was seen.

Detailed literature review has documented a total of 21 cases on occurrence of facial talons in deciduous and permanent dentition, out of which 19 were in the permanent dentition and 2 in the primary dentition.^[4,17-29] Among these, 5 showed solitary talon's cusp in deciduous dentition and 15 showed solitary talon's in permanent dentition. Only one case documented by Pillai *et al.*^[30] in 2017 showed a rare case of fused talon's cusp on the facial surface of the permanent left maxillary central and lateral incisor. Our case is the second documented case of double talons. The second rare finding that is not documented in previous literature is that both the talons were of unequal length.

Based on this background, we intend to propose a new classification system for double facial talons based on their size (equal/unequal) and presence of developmental grooves (separate or fused) as type 1: equal-sized and separated by a developmental groove, type 2: unequal size and separated by a developmental groove, type 3: equal-sized and fused, and type 4: unequal size and fused [Figure 4]. On the basis of this, the present case belongs to type 2. The aim of this new classification system is to enlighten new area of research that can be conducted on the treatment aspect by studying the difference in the

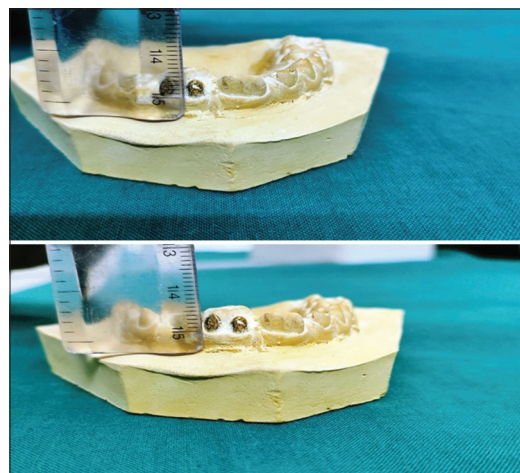


Figure 3: Alginate model cast of double facial talons

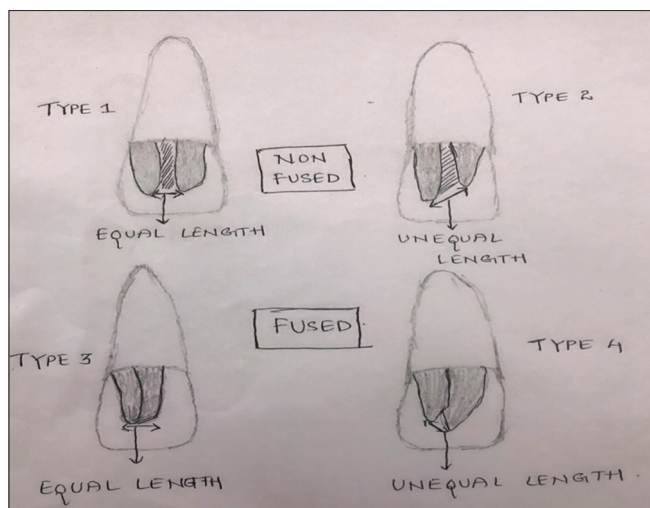


Figure 4: Hand-drawn illustration of the new proposed classification for double facial talons.

structure of enamel rods, dentin, especially in case of double talons of unequal size (as the direction of enamel rods/dentinal tubules of the talons with that of the direction of enamel rods/dentinal tubules of underlying tooth will vary) and their compatibility with choice of dental materials to be used for proper adaptation and develop new treatment protocols of tooth preparation and restoration for such cases.

The occurrence of this condition is of prime concern as it may result in esthetic, occlusal, and pulpal/periodontal issues. However, the management of such anomaly depends on the size and extent of the talons, presence or absence of the pulp horn, and occlusal interference. Small asymptomatic types are treated conservatively by grinding and allowing reparative dentin formation with later application of desensitizing agents. Cases with pulp involvement are treated endodontically with cuspal reduction and orthodontic correction. Soft tissue irritation such as irritation of the mucosa during speech, smiling, and mastication have also been documented. The present case did complain of irritation of inner surface of the upper labial mucosa during smiling as these cusps were well developed and prominent. However, there was no occlusal interference and patient was reluctant for treatment.

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Conflicts of interest

There are no conflicts of interest.

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