Talon cusp—Clinical significance and management: Case reports

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Talon cusp is a rare dental anomaly manifested as an accessory cusplike structure on the tooth crown. This article reports four cases of talon cusp that caused clinical problems related to appearance, occlusal interference, tooth displacement, caries, and tongue irritation. The cases presented were associated with other dental abnormalities, suggesting per se that genetic inheritance may be the causative factor. Clinical and radiographic characteristics of this developmental anomaly and modes of treatment are described. (Quintessence Int 1995;26:115-120.)

Introduction

Talon cusp is an uncommon dental anomaly in which an accessory cusplike structure projects from the cingulum area or cementoenamel junction of the maxillary or mandibular anterior teeth in both primary and permanent dentitions. This anomaly has been named talon cusp because, in its typical shape, it resembles an eagle’s talon.

Since Mitchell described the talon cusp in 1892, about 73 cases, with 96 affected (taloned) teeth, have been reported; the permanent dentition has been involved three times more often than the primary dentition. Males have had a higher incidence of talon cusp than have females. Among the 73 cases, the male-female ratio was 47:26. The majority of the reports have been published during the past 25 years, perhaps because of increasing awareness of the clinical significance of the anomaly.

The term talon cusp has been applied somewhat loosely to cusplike formations that vary in size, shape, length, and degree of attachment to the tooth crown. Some reports have presented talon cusp as a markedly enlarged or exaggerated cingulum on the maxillary incisors. Others have described talon cusp as a “projection of a millimeter or more” extending at least half the distance from the cementoenamel junction to the incisal edge. Talon cusp may project with connection to the incisal edge, forming a T-shaped or, if lower in level, a Y-shaped crown contour. In other cases, the tip of the anomalous cusp may stand away from the rest of the crown. Talon cusps are delineated by deep developmental fissures or grooves that accumulate plaque and become susceptible to caries. Histologically, the cusp is composed of normal enamel and dentin; pulpal tissue may be present or absent.

The etiology of the condition remains unknown. As with other abnormalities of tooth shape and size, talon cusp occurs early in odontogenesis, i.e., during the morphodifferentiation stage. It may occur as a result of outward folding of the inner enamel epithelial cells (precursors of ameloblasts) and a transient focal hyperplasia of the mesenchymal dental papilla (precursors of odontoblasts). The talon cusp has not been reported as an integral part of any specific syndrome, although it appears to be more prevalent in patients with Rubinstein-Taybi syndrome, Mohr syndrome (oral-facial-
Talon cusp is not an entirely innocuous defect because it may give rise to complications. The present report describes four cases of talon cusp that caused clinical problems and were associated with other dental anomalies. All patients were Jordanian Arabs presenting to the Dental Center at Jordan University.

Case Reports

Case 1

An 11-year-old boy complained of an "extra tooth" in the maxillary anterior region that caused irritation to the tongue during speech. The patient’s medical and dental histories were unremarkable. Intraoral examination revealed no soft tissue changes. The maxillary left lateral incisor had a large, well-defined accessory cusp on the palatal surface, hornlike in shape and extending from the cementoenamel junction to within 1 mm of the incisal edge of the tooth (Fig 1a). The anomalous cusp measured 8.0 mm in length (incisocervically) from the base to the tip, 5.0 mm in width (mesiodistally), and 3.0 mm in thickness (labiolingually). The tip of the cusp stood away from the rest of the crown and deviated toward the mesial aspect. A deep developmental groove was present on either side of the cusp, where it joined the palatal surface of the tooth.

The developmental grooves were not carious but continued dental plaque. The anomalous cusp was irritating to the tongue and interfered with the occlusion as a result of premature contact of the cusp with the opposing tooth (Fig 1b). Attrition marks were found on the tip of the cusp and on the incisal edge of the oppos-
Fig 2a Case 2. The occlusal view of the cast reveals a pyramid-shaped talon cusp, on the maxillary left lateral incisor. The cusp causes a Y-shaped crown outline. Note the microdont antimere with dens invaginatus and the shovel-shaped central incisors associated with tuberclelike cingula.

Fig 2b The radiograph of the teeth depicted in Fig 2a fails to reveal pulpal extension into the talon cusp.

ing tooth. The affected (taloned) tooth had drifted slightly labially, and there was a reduction in the anterior overbite. Electric pulp testing revealed the taloned tooth to be within normal limits. A periapical radiograph revealed a V-shaped radiopaque structure on the involved incisor. The point of the “V” was toward the incisal edge. The talon cusp was outlined by two thin white lines representing the enamel converging from the cervical area toward the incisal edge. Pulpal extension was limited to the base of the cusp (Fig 1c). A diagnosis of talon cusp was made.

The talon cusp was associated with other tooth abnormalities, including (1) a shovel-shaped contralateral maxillary lateral incisor; (2) an exaggerated Carabelli cusp on the primary maxillary right second molar; and (3) an additional tubercle on the palatal surface of the maxillary right central incisor.

Case 2

A 35-year-old woman presented for replacement of extracted maxillary left premolars. Clinical examination showed a prominent accessory cusp on the palatal surface of the maxillary left lateral incisor. The cusp, pyramidal in shape, originated from the cementoenamel junction, occupied the entire cervical third of the crown, and extended to within 0.5 mm of the incisal edge, forming a Y-shaped crown outline. The tip of the talon cusp was rounded and in close proximity to the palatal surface of the tooth (Fig 2a). The cusp measured 5.5 mm in length and 4.5 mm in width. A shallow developmental groove was present on either side of the talon cusp.

Neither of the developmental grooves was carious. The cusp interfered with occlusion, and advanced wear facets were present on it and the incisal edge of the opposing tooth. The involved tooth had drifted labially. Radiographic examination failed to reveal extension of the pulp into the cusp (Fig 2b).

Other dental abnormalities detected were (1) a microdont antimere with dens invaginatus and (2) shovel-shaped central incisors with tuberclelike cingula (Fig 2a).

Case 3

An 11-year-old girl presented to the dental clinic complaining of an “ugly” maxillary incisor. Intraoral examination disclosed an abnormally shaped maxillary left lateral incisor. The tooth was rotated and had a large, vertical accessory cusp on the palatal surface that projected from the cementoenamel junction and extended the entire length of the crown. The distal side of the cusp blended with the surface of the crown, while the mesial side of the cusp was separated from the rest of the crown, resulting in a premolar appearance when viewed labially (Fig 3). The talon cusp measured 6.0 mm in length, 4.0 mm in width, and 3.0 mm in thickness. The tip of the cusp was rounded and not irritating. A
deep groove was present along the mesial aspect of the talon cusp where it joined the palatal surface.

A sharp explorer did not catch in the groove; however, the groove was darkly stained and retained plaque. The cusp interfered with occlusion by forming a premature contact, resulting in labial displacement and rotation of the affected tooth.

Another odontogenic aberration observed was shoveling of the antimere accompanied by dens invaginatus.

Case 4

A 23-year-old woman reported to the dental clinic with a chief complaint of pain in the temporomandibular joint. Her medical history was unremarkable. The patient had suffered from bruxism for several years. Clinical examination revealed an unbalanced occlusion associated with attrition. Cusplike structures affected the palatal surface of the maxillary canines and the left lateral incisor. The anomalous cusps extended from the cementoenamel junction to the cervical third of the crown. The tips of the cusps were either sharp and projected away from the rest of the crown or rounded and in close proximity to the palatal surface (Fig 4a). The length of the cusps ranged from 3 to 4.5 mm and the width from 3.0 to 4.0 mm.

A carious fissure was present on the distal aspect of the talon cusp on the maxillary left lateral incisor. The affected teeth responded normally to electric pulp testing. Only the cusp on the left lateral incisor was a source of irritation to the tongue during speech and was
Table 1  Anomalies associated with the cases of talon cusp reported in the present study

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex</th>
<th>Age (y)</th>
<th>Talon tooth No.</th>
<th>Manifestations</th>
<th>Associated abnormalities and teeth involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>11</td>
<td>22</td>
<td>Interference with occlusion; irritating to tongue; attrition</td>
<td>Shovel-shaped tooth 12; additional on tubercle tooth 11; exaggerated cusp of Carabelli on tooth 16</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>35</td>
<td>22</td>
<td>Interference with occlusion; attrition</td>
<td>Microdont tooth 12; shovel-shaped tooth 21; tuberclelike cingulum on tooth 21</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>11</td>
<td>22</td>
<td>Interference with occlusion; unesthetic</td>
<td>Displacement and rotation of tooth 22; dens invaginatus and shoveling of tooth 12</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>23</td>
<td>13, 22, 23</td>
<td>Irritating to tongue</td>
<td>Bifid cingulum on tooth 12</td>
</tr>
</tbody>
</table>

marked by an attrition facet. A periapical radiograph revealed the presence of tuberclelike radiopaque structures emerging from the cervical part of the root and superimposed on the pulp horn of affected teeth (Fig 4b).

A dental variation associated with the talon cusps was an accentuated bifid cingulum on the shovel-shaped maxillary right lateral incisor.

Discussion

There are insufficient data on the prevalence of talon cusps, criteria for categorization, association with other dental abnormalities, and management. Talon cusp has been reported as a very rare dental anomaly. In a clinical and radiographic survey of American children, Buenviaje and Rapp reported that the prevalence of a talon was 0.17%, but they did not indicate the criteria used for diagnosis or whether the anomaly occurred in the primary or permanent dentition. Chawla and others defined a talon cusp as a “demarcated projection of a millimeter or more present on the lingual surface of anterior teeth.” Using this wide criterion, they estimated a prevalence of 7.7% in their sample of North Indian children. Observations of the occurrence of talon cusps in Chinese and Arabs indicate that this anomaly is not a rarity in certain racial groups.

The cases presented were unique because they were associated with other abnormalities of tooth form (Table 1). This may suggest that talon cusp is not an isolated defect. Other sporadic anomalies reported to be associated with talon cusp are peg-shaped lateral incisor, impacted mesiodens and canine, odontoma, megadont, dens evaginatus, and supernumerary teeth. We have diagnosed 11 cases of talon cusp, including the present cases, during the period from September 1992 to February 1993. Family histories revealed that six of the 11 patients had a history of parental consanguinity. In four of the patients, one or more of the siblings or parents was affected by talon cusp. In this context, an enlarged cingulum and a small accessory cusp were considered variants of talon cusp. The substantial racial and sex differences in the occurrence of talon cusp, as well as its bilateral distribution in some cases and its association with other dental abnormalities, suggest that talon cusp may be genetically determined.
The anomalies reported caused a number of clinical problems, including poor esthetics; occlusal interference; displacement of the taloncusp tooth; caries-susceptible developmental grooves; attrition; irritation of the tongue; and interference with tongue space. Early diagnosis of talon cusp is important, and in most cases definitive treatment is needed. Deep noncarious developmental grooves on the lateral aspects of the anomalous cusps should be cleaned with a slurry of pumice, acid etched, and sealed with fissure sealant. If the grooves are carious, the lesion should be removed and the cavity obturated with glass-ionomer restorative material. In case of premature contact and occlusal interference, the talon cusp should be reduced gradually on consecutive visits over 6- to 8-week intervals to allow time for deposition of reparative dentin for pulpal protection. After each grinding procedure, the tooth surface should be covered with a desensitizing agent, preferably fluoride varnish (Duraphat, Welm Pharma, a viscous alcoholic suspension of natural colophony resin containing 2.26% F as sodium fluoride at neutral pH). Where esthetic appearance and occlusal interference are not a problem, the concavity between the cusp and tooth surface can be obturated with composite resin. Under certain conditions, less conservative methods can be used, including complete reduction of the cusp followed by calcium hydroxide pulpotomy for an immature tooth or root canal therapy. It is hoped that this presentation will increase the awareness of clinicians of the clinical significance of talon cusp and of the problems created by its presence. Early diagnosis and management are important if complications are to be avoided. The association of talon cusp with other dental abnormalities suggests that this developmental anomaly is not an isolated trait. Possible etiologic factors have been discussed and conservative management has been outlined. Precise criteria for classification of talon cusp are warranted.

References