Case Report

Talon cusp management: Esthetic and occlusal balance

ABSTRACT

This report presents a case of talon cusp affecting the maxillary right upper central incisor. This developmental dental anomaly varies in frequency from 1% to 6% of the total population. Its occurrence affects the esthetics, occlusal harmony, leads to irritation of soft tissues and increased susceptibility to dental caries. The difficulties in the identification and scientific management are always a challenge for the orthodontist and general dentist. As it causes traumatic bite and occlusal imbalance, along with orthodontic treatment cusp reduction is always necessary. This case report allows comprehensive and conventional treatment approach for talon's cusp in a stepwise planned manner by conserving the vitality of the pulp, achieving maximum esthetic and occlusal balance along with avoiding patient discomfort.

Keywords: Talon cusp, Esthetics, Occlusal balance, Dental anomaly, Grinding

INTRODUCTION

Talon cusp is a developmental dental anomaly during which an adjunct cusp arises from the cingulum or cementoenamel junction of the anterior teeth in maxilla or mandible.[1] The composition of talon cusp is similar to any other cusp, consisting enamel, dentin and sometimes have pulpal tissue as well. This additional cusp is generally situated on the lingual surface of teeth, giving it a three-pronged look and is very rarely present on the facial surface of teeth. A deep developmental groove may present between the lingual surface of teeth and talon cusp. A comparable condition called dens evaginatus occurs primarily on posterior teeth; conversely, talon cusp is more specifically the manifestation on anterior teeth. The frequency of this anomaly varies from 1% to 6% of the total population.[2] Permanent dentition is most commonly affected by talon cusp and deciduous dentition is very rarely affected.[3] In majority of cases, talon cusp is present on maxillary lateral incisors (55%), second common is maxillary central incisors (33%), mandibular incisors (6%), and maxillary canines (4%).[3] Talon cusp can be classified into type I, Type II, and Type III, mainly depending upon the degree of formation of cusp shape and length of extension.[4]

Type I (major talon)

A well-defined supplementary cusp that mainly projects from the palatal surface of a primary or permanent anterior tooth that extends a minimum of half the space from the cementoenamel junction to the incisal edge.

Type II (semi talon)

It is approximately 1 mm or more in length but extends less than half the distance from cementoenamel junction to incisal edge.

Type III (trace talon)

It projects from the cingulum and is prominent or bulbous in any form (tubercle-like, conical, or bifid).

Deepak Chauhan, Sanjeev Datana[1], Prasun Mukhopadhyay

Army Dental Corps, [1]Department of Dental Surgery and Oral Health Sciences, Division of Orthodontics and Dentofacial Orthopedics, AFMC, Pune, Maharashtra, India

Address for correspondence: Dr. Deepak Chauhan, MDS (Orthodontics), Army Dental Corps, Uttar Pradesh, India.
E-mail: drdeepakchauhan99@gmail.com

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The genetic or environmental factors may contribute for etiology of talon cusp but specific etiology is unknown, it can have a spontaneous onset. This anomaly takes place during developmental stages so prevention is not possible. Both male and females are equally affected by talon cusp, but in literature, the majority of reported cases are males.[4] The population more frequently affected are of Asian, Arabi, and Native American origin.[4] Few syndromes such as Rubinstein–Taybi syndrome and orofacial digital II syndrome are commonly have high chances of talons cusp. Common anomalies associated with talon cusp are supernumerary teeth, dens evaginatus, peg laterals, agenesis, and impacted teeth.[4]

During orthodontic treatment, a talon cusp possibly will impede anterior retraction and hamper in achievement of harmonious occlusion. This article describes an effective management of a talon cusp in an orthodontic patient.

CASE REPORT

A 19-year-old female patient reported to our tertiary care government center in department of orthodontics, with the chief complaint of irregular upper and lower front teeth. On extraoral examination, she has well-balanced face and mild convex profile. The patient has skeletal Class I bases with Class I molar relationship and moderate crowding in both maxilla and mandible. A conical talon cusp with measurements of 5 mm in length from incisal to cervical, 4.5 mm in width from mesial to distal, and 3 mm in thickness from labial to lingual was noted on the palatal surface of the maxillary right central incisor [Figure 1a-c]. There were no developmental grooves present at talon cusp and incisor surface interface. During occlusion, the talon was virtually touching the mandibular right central incisor [Figure 2a and b]. Therefore a diagnosis of Type 1 Talon was articulated. Elimination of Talon's cusp was judged indispensable to permit retraction of maxillary anterior teeth. Patient and her parents were educated about the complete course of treatment and prior informed consent was obtained from the patient's parents before reporting the case.

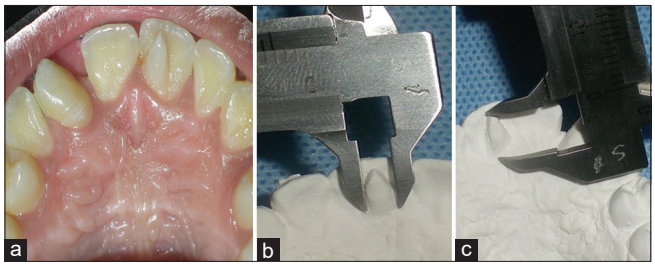

Figure 1: Talons cusp on maxillary right central incisor and measurements

After initial leveling and alignment, patient was referred to the Department of Operative Dentistry and Endodontics for the management of Talon's cusp on right maxillary central incisor. Conservative technique of management encompassing gradual grinding of the supplementary cusp was scheduled.

The vitality test was positive and no discomfort or pain was present in the maxillary central incisor. Desensitizing toothpaste was advocated before the start of the talon-cusp management. Before starting the grinding procedure, a putty index was prepared, with purpose to visualize the reduction of the cusp in every visit. During the first visit, the tip of talon cusp projection was grinded, using flame-shaped diamond bur in a high-speed micro motor handpiece appropriately to reduce the premature contact with the incisal edge of the mandibular central incisor which had caused the attrition of the same. Successively, in 3 visits divided by 4-week interval, grinding was carried out on the lateral side of Talon's cusp to eliminate it [Figure 3a-c]. In each visit, the putty index guided the amount of reduction which was restricted to 1 mm [Figure 4a and b]. A desensitizing toothpaste was advised to patient for twice daily use during this time period. Pulp vitality was evaluated with a cold test before each grinding session. During final visit, flowable composite resin was used as final sealing material. The patient reported very mild sensitivity during entire treatment duration. Esthetic composite buildup was done for attrited mandibular right central incisor [Figure 5]. After completion of orthodontic treatment, the patient was found to be totally asymptomatic with teeth well aligned and complete spaces closure.

DISCUSSION

Although talon cusp might not appear serious, and in some people could also be completely benign, it can cause clinical, diagnostic, and functional problems and alters the looks of an individual's teeth. The condition was first described by

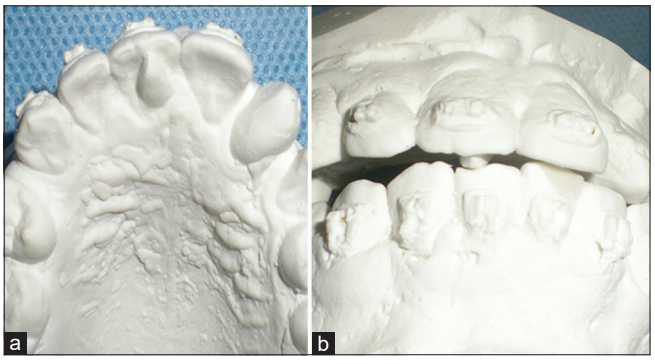

Figure 2: Diagnostic casts showing type I talons cusp with occlusal interference and attrition of mandibular right central incisor

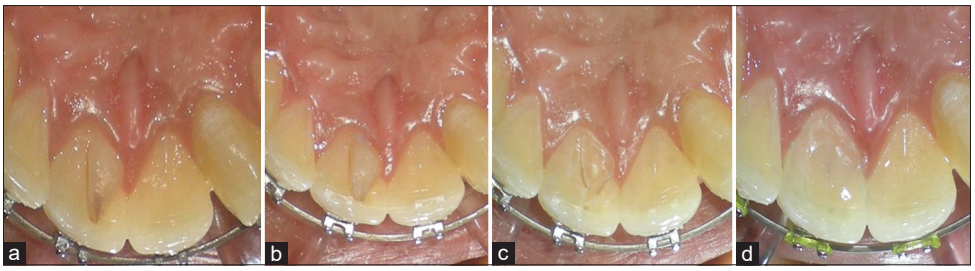

Figure 3: Sequential grinding of talon cusp over four consecutive appointments at an interval of 4-weeks

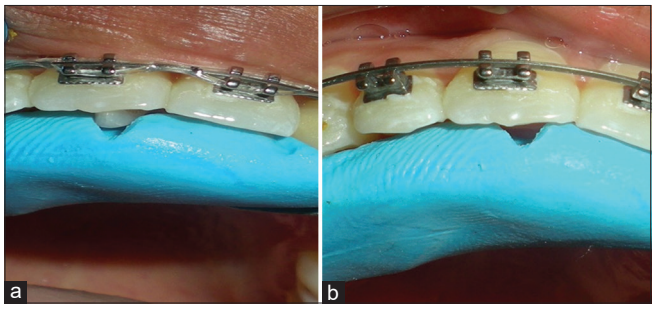

Figure 4: Putty index for assessing the amount of reduction

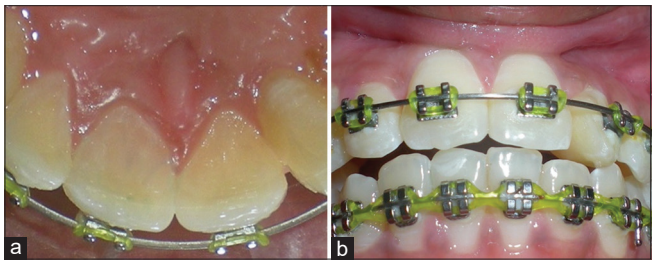

Figure 5: Final outcome with esthetic build-up of mandibular right central incisor

W. H. Mitchell in 1982 and named by J. Kimball Mellor and Louis W. Ripa[5] due to its analogous form to an eagle's talon. Common symptoms of talon cusp consist of interference with occlusion or bite, irritation of soft tissues and tongue, accidental cusp fracture, susceptible to dental caries.[6] Some common treatments include fissure sealing, composite resin restoration, reduction of cusp, pulpotomy, root canal (endodontic treatment), extraction.[6] According to the classification of Hattab *et al.*, our patient has Type I (Talon): an additional cusp projecting from the palatal surface of an anterior tooth and extending at least one-half the distance from the cementoenamel junction to the incisal edge. Many cases of talon cusp were reported in the literature, like talon cusp on permanent mandibular left central incisor by McNamara et al. and another case of talon cusp on both palatal and facial surface related with permanent maxillary left central incisor by Abbott.[7] In both the cases talon cusp was managed by selective grinding. Also endodontic therapy was used in the latter case. Likewise Glavina and Skrinjarić had reported a similar case which was managed by selective grinding and composite restoration on permanent maxillary left central incisors.[8] Gradual reduction of talon's cusp was monitored as it conserves the pulp vitality and prevents the risk of pulp exposure and distress associated with profound dentinal preparation.[9] The grinding procedure was done along the lateral side of the talons cusp and not at the tip of the cusp as most of the odontoblasts lie along the length of the cusp. These odontoblasts stimulate deposition of reparative dentin in the time interval between the appointments.[9] The putty index acted as an orientation device. It helped in pursuing the exact extent of reduction and also the uniform grinding of cusp along all sides.

The procedure mentioned in this case report will not be suitable in all conditions, primarily when occlusal interference is severe. These type of cases demands, an early intervention, involving complete removal of the cusp, commonly supplemented by endodontic management.

CONCLUSION

Talon's cusp been a morphological variation needs accurate identification which is vital in treatment planning of such dental anomalies to overcome postoperative problems. This case report allows comprehensive and conventional treatment approach for Talon's cusp in a stepwise planned manner conserving the vitality of the pulp, achieving maximum esthetic and occlusal balance along with avoiding patient discomfort. This conventional management approach is advantageous as it permits formation of reparative dentin, which preserves vitality of the tooth. Periodic recall is strongly recommended to assess vitality of the tooth to overcome unforeseen consequences.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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