

Talon Cusp from Southern Region of Saudi Arabia: Report of Two Cases with Mini Review

Loay Ebrahim A. Najmi^{1*}, Rahaf Abdullah Houmady¹, Rahaf Ahmed Halawi¹, Sana Essa Ageel¹, Rayan Ali Nahari¹, The-Anoon Abdo Baggash^{2,3}

¹Dental Intern, College of Dentistry, Jazan University, Jazan, Saudi Arabia

²College of Dentistry, Hodeidah University, Al Hodeidah, Yemen

³Al-Shifa College for Technical and Medical Science, Al Hodeidah, Yemen

DOI: [10.36348/sjodr.2024.v09i01.002](https://doi.org/10.36348/sjodr.2024.v09i01.002)

Received: 07.12.2023 | Accepted: 12.01.2024 | Published: 16.01.2024

*Corresponding author: Loay Ebrahim A. Najmi

Dental Intern, College of Dentistry, Jazan University, Jazan, Saudi Arabia

Abstract

Talon cusp is an uncommon dental anomaly characterized by the presence of an accessory cusp-like structure projecting from the cingulum area of an anterior teeth. This anomaly generally poses problems for the patient in terms of esthetics, caries control and occlusal accommodation. This cases report with mini-review presents a brief classification of talon cusp, summary of published case report worldwide, and a unique occurrence of maxillary talon cusp in a 23-year female and 9-year male patient. The clinical and radiographic findings, along with the management of this rare dental anomaly are discussed.

Keywords: Talon cusp, gender, arch, Saudi Arabia.

Copyright © 2024 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

BACKGROUND

A talon cusp, also known as an "eagle talon" or "talon," is a dental anomaly characterized by an additional cusp or projection that extends from the cingulum or cemento-enamel junction of a tooth. This accessory cusp resembles an eagle's talon, hence the name. The condition can occur in either maxillary or mandibular anterior teeth in both the primary and permanent dentitions. Additionally, it may present on the labial aspect of permanent teeth [1]. It occurs as a result of disturbances during the morpho-differentiation stage of tooth development [1]. Histologically, it comprises regular enamel and dentin, and the presence of pulp tissue is variable [2]. The incidence of Talon cusp ranging from 0.04 to 8% [3].

Mitchell reported the first case of talon cusp in 1892 in a woman who showed a horn like cingulum on the left maxillary central incisor [4]. Nearly a century later, the nomenclature was changed to "talon cusp" (talon refers to claw) because the anomaly presented with morphological characteristics similar to an eagle talon [5]. Although this term has been widely accepted, various names have been given by different authors for

the same phenomenon –cuspated cingulum, accessory cusp, dens evaginates, evaginated odontoma, hyperplastic cingulum, and supernumerary lingual tubercle [6]. Additionally, the odontogenic abnormality has received several other classifications (Table 1). Both sexes are affected, and both primary (25%) and permanent dentition (75%) are involved. Males are more affected than females. Talon cusp is usually unilateral but 20% cases reveal bilateral occurrence [7]. With regard to tooth affinity, central incisors are involved in the primary dentition, and the maxillary lateral incisor is most often affected in the permanent dentition (67%) [8]. Some prevalence studies have shown that talon cusp could be more frequent in larger teeth, for example in permanent rather than primary dentition [9] or in maxillary rather than mandible [10].

Complications arise across different domains, the deep grooves pose difficulties in cleaning, allowing the retention of plaque and food debris, potentially resulting in caries, subsequent periapical pathologies, and, in some cases, periodontal disease [10].

Therefore, treatment of talon cusps depends on the severity of the condition and associated problems. In

some cases, the talon cusp may be reshaped or removed for esthetic or functional reasons. Restorative procedures may also be necessary to address any dental problems associated with the talon cusp. Thus, the aim of this study is to report two cases of "Talon Cusp Type II and III" and to discuss diagnosis methods, treatment options, and the importance of knowledge of this morphological change among dental professionals. Table 2 represents previous cases reports published during last years, and information of author and year, patient gender, age, side involvement, tooth type and location, degree of involvement and treatment type if any and needed.

CASE REPORT

Case #1

A 23-year-old female presented to the dental clinic with a chief complaint of mild discomfort while closing the mouth. The patient's medical and family

history did not offer any relevant contributions. There were no abnormalities detected during the general examination and frontal view Figs 1A. Intraoral examination revealed presence of an elongated, well-defined, and pointed cusp arising from the palatal aspect of left maxillary lateral incisor tooth (22). No developmental abnormalities were observed in other teeth. Upon examination of the affected tooth, a clearly defined accessory cusp was identified, protruding from the palatal surface of the left maxillary lateral incisor and extending halfway from the cemento-enamel junction to the incisal edge (Figs 1B) with carious involvement found at side of the accessory cusp bilaterally. Upon radiographic assessment, the periapical radiograph revealed a V-shaped radiopaque appearance overlaying the crown of the left maxillary lateral incisor (Figs 1 C-D). A diagnosis of Type 3 talon cusp (Trace talon) was determined based on Hattab's classification, and it was accompanied by bilateral caries invasion.

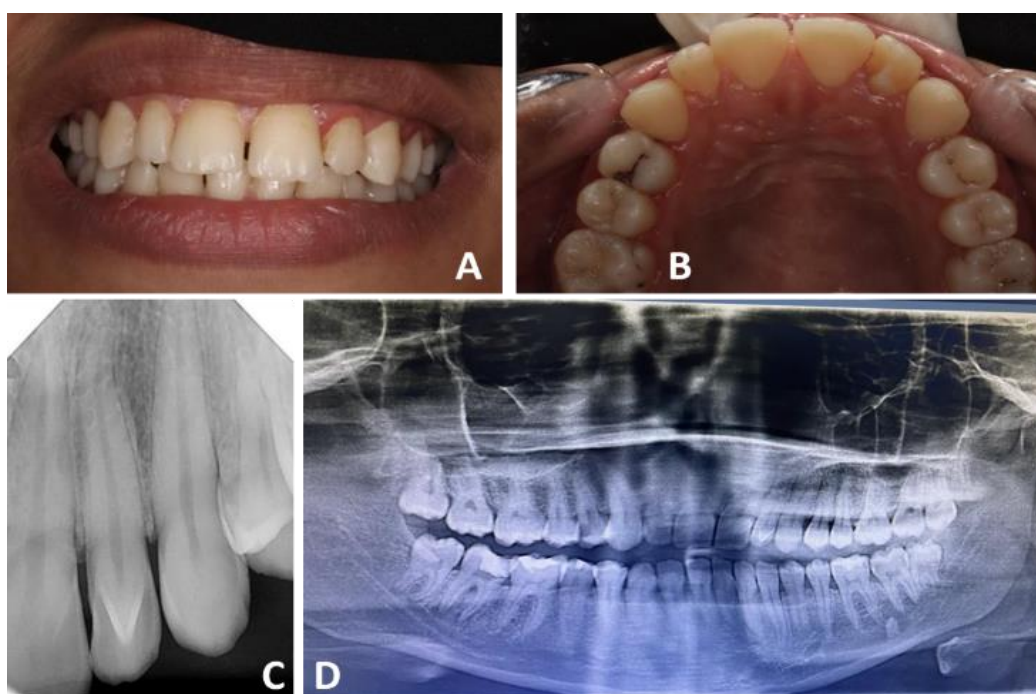


Figure 1: case #1 with type 2 talon cusp: Frontal View (A), Occlusal View(B), Periapical View (C), Panoramic View (D)

Case #2

A 9-year-old male presented to the dental clinic with his parents who reported that " I feel like there is another tooth behind my upper anterior left teeth and it's annoying me". Following the approval obtained through signatures on the Informed Consent Agreement from both the patient and his parents, a clinical examination was conducted (Figs 1A). The observation revealed characteristics consistent with a Type II cusp projection. This involved an extra cusp displaying altered morphology, distinguished by a well-defined prominence resembling a talon, protruding from the palatal extension of maxillary left lateral incisor tooth. Furthermore, more than half of the clinical crown of the tooth extended to the cemento-enamel junction (Fig 2B).

The groove retained biofilm and food debris due to challenges in cleaning; however, no signs of carious processes were evident. Subsequently, it was noted that the dimensions of the anomaly led to occlusal interference and premature contacts with opposing teeth. On radiographic examination, a "V"-shaped structure with increased radiopacity was evident in the tooth crown, exhibiting characteristics similar to a cusp originating from the cervical third of the teeth (Fig 2 C-D). Talon cusp was reduced in a single session utilizing a high-speed diamond cutter with intermittent movement and cooling, while the patient was adequately anesthetized. Following the successful removal of the accessory cusp, then desensitizing materials were applied to prevent the exposure of dentinal tubules,

ensuring that the patient experienced no sensitivity. The grooved regions were appropriately sealed with pits and fissures sealant, providing a fluoride-releasing effect.

Table 1: Classification of talon's cusp, designed to describe lingual and palatal cases

Classification	Definition
Hattab's <i>et al.</i>, classification of talon's cusp, designed to describe lingual and palatal cases	
Type 1 (True talon)	A well-defined projection that extends from the <i>cingulum</i> to more than half the distance to the incisal edge.
Type 2 (Semi talon)	A well-defined projection that extends less than half the distance to the incisal edge.
Type 3 (Trace talon)	A trace expression equivalent to enlarged cingula and their variations, which include the conical type, bifid, and tuber.
Chin-Ying's classification of talon's cusp, describing labial talon cusp	
Major talons	Well-delineated cusp present in the facial surface of an anterior tooth extends at least half the distance from the cementoenamel junction to the incisal edge of affected tooth.
Minor talons	Extend more than one fourth and less than half the distance from the cementoenamel junction to the incisal edge of the facial surface of affected tooth.
Trace talons	Predominantly enlarged prominent cingula and their variations occupies less than one fourth the distance from the cementoenamel junction to the incisal edge of the affected tooth.

Table 2: Characteristics of published case reports with talon cusp

Author (s)/year	N. of cases	Gender	Age	Side involved	Tooth type/ location	Degree of extent and shape	Treatment
Aparna <i>et al.</i>, 2016 [1]	2	Female	13	Right	Maxillary central/ labial	8.5mm in length/ 3mm in width	Patient denied treatment
		Male	10	Left	Maxillary central/ labial	7.5mm in length/ 2.5 mm in width	Patient denied any treatment for talon cusp
Radhika <i>et al.</i>, 2014 [2]	7	Female	10	Right	Maxillary lateral/ palatal	type 3	No treatment was preformed
		Female	11	Right	Maxillary lateral/ palatal	type 2	Conservative treatment protocol was used
		Male	22	Left	Maxillary lateral/ palatal	type 1	Conservative treatment protocol was used
		Male	18	Left	Maxillary lateral/ palatal	Not specified	Conservative treatment protocol was used
		Female	22	Right	Maxillary lateral bilaterally/ palatal	H-shape	More radical approach was used as pulpal involvement was seen bilaterally
		Female	20	Right	Maxillary lateral/ palatal	T-shape	Conservative treatment protocol was used
		Female	22	Left	Maxillary lateral/ palatal	Not specified	Conservative treatment protocol was used
Kalpana <i>et al.</i>, 2015 [3]	1	Female	48	Right	Maxillary lateral/ palatal	Type 1	Patient refuse crowning
Inderchand <i>et al.</i>, 2022 [14]	1	Male	2	Left	Primary Maxillary lateral/palatal	4.5 mm in Length/ 4.0 mm in width	No treatment was conducted
Kar S /2016 [15]	1	Female	18	Left	Maxillary lateral/ palatal	type 1	Restored with type nine extra strength glass ionomer cement

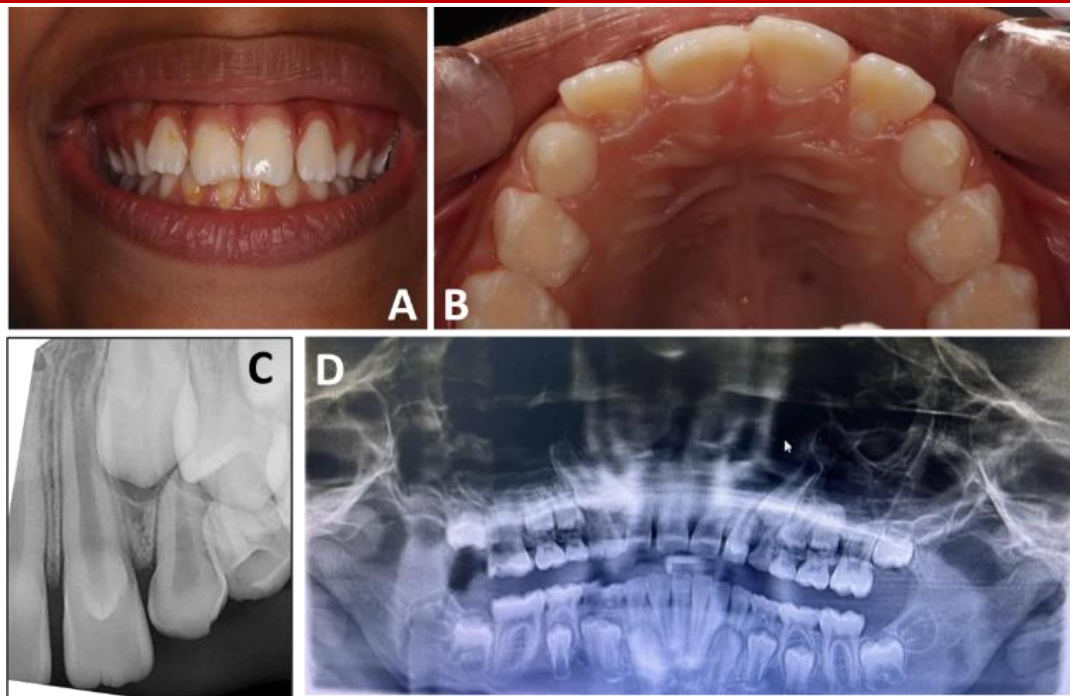


Figure 2: case #1 with type 2 talon cusp: Frontal View (A), Occlusal View(B), Periapical View (C), Panoramic View (D)

DISCUSSION

Talon cusp is a developmental dental anomaly characterized by an additional cusp-like structure projecting from the cingulum area of a tooth. According to Hattab *et al.*, a large talon cusp may extend to the incisal edge, giving the tooth a "T" or "Y" shape [8]. The presence of a talon cusp can have several implications for the affected tooth, including potential complications with occlusion, esthetics, and susceptibility to caries and periodontal disease.

The specific cause of the talon cusp's origin remains unclear. Different hypotheses have been proposed to clarify its etiology [11]. The talon cusp is believed to arise during the morpho-differentiation stage of tooth development, potentially due to the outfolding of the enamel organ or increased productivity of the dental lamina [1]. An additional hypothesis proposes that genetics plays a role in the development of talon cusp, as evidenced by its occurrence within specific family group [12] Shafer *et al.*, proposed that talon cusp may result from trauma and other localized forces acting on the tooth germ [13]. The presence of the accessory cusp has been observed in conjunction with various other dental anomalies, including supernumerary teeth, odontomas, impacted teeth, peg-shaped lateral incisors, and dens invaginates. Individuals born with oral clefts exhibit a higher incidence of developmental enamel defects. Conversely, talon cusps may co-occur with other dental anomalies, indicating a potential genetic link [1, 12, 13].

The literature on talon cusp provides valuable insights into its occurrence patterns. Dumancic *et al.*, noted that talon cusp is typically unilateral, but in 20%

of cases, it manifests bilaterally [7]. The observation in our report aligns with findings reported by different case reports published by different authors [1-3, 14, 15], who collectively documented most cases of talon cusp presenting unilaterally. Additionally, both cases in this study were categorized as Semi and Trace talon based on Hattab's classification. However, it is worth mentioning that by [3, 14, 15] reported contradictory findings. Furthermore, the literature reveals that in reported cases of talon cusps occurring in permanent teeth, the maxillary lateral incisors are frequently involved on the palatal aspect, followed by the central incisors with labial occurrence [1]. In contrast, when talon cusps occur in primary teeth, they are commonly found on the maxillary central incisors [14]. This information contributes to the understanding of the distribution and prevalence of talon cusp in both permanent and primary dentition.

It is important for clinicians to correctly diagnose and manage talon cusps in order to prevent unnecessary interventions and ensure optimal oral health outcomes for patients [16]. Treatment of talon cusps typically involves a combination of conservative measures and restorative techniques. Conservative measures may include reshaping the talon cusp to eliminate sharp edges and improve esthetics, while restorative techniques may include composite resin bonding to restore the anatomy and function of the affected tooth. In more severe cases, the talon cusp may need to be completely removed through odontoplasty or endodontic therapy followed by crown placement. According to Hattab *et al.*, reported that only the sealing of cracks is recommended for those that do not have major clinical complication. If there is evidence of dental

caries, the tooth must be restored. The same protocol was followed for treatment of case #1 all. It is advisable to grind the talon cusp when there is evidence of premature contact and occlusal interference. This grinding process should be carried out gradually over a 6–8-week period, allowing sufficient time for the deposition of reparative dentin and protection the pulp [8]. In contrast to this specified approach, Ozcelik and Atila advocate for a more aggressive "radical treatment" approach, involving a single-session reduction of the talon cusp [17]. This unconventional protocol was applied in the first case discussed in this paper, chosen due to the presence of tooth caries in the grooves surrounding the accessory cusp. According to Thirumalaisamy *et al.*, [12], in the event of pulp exposure during the gradual reduction of the talon cusp, endodontic treatment that is best suited for the tooth in question should be performed. For this, the degree of development and root vitality should be noted, and the traditional endodontic technique, apexification, or the technique of apexogenesis should be utilized. Fortunately, no pulp was existing during the procedure carried out in these cases.

Therefore, it is necessary that dental professionals recognize all types of this anomaly so as not to confuse it with other morphological changes, thereby avoiding unnecessary surgical procedures. A correct diagnosis is necessary to prevent decay, malocclusion, and aesthetic issues, thus improving the oral health and quality of life of the patient. Overall, the management of talon cusps requires careful consideration of the patient's individual case and goals for treatment, with an emphasis on maintaining the long-term health and function of the affected tooth.

CONCLUSION

Talon cusp is a rare dental anomaly that requires careful clinical and radiographic examination for accurate diagnosis and appropriate management. This cases report emphasizes the importance of understanding and addressing such anomalies to ensure optimal oral health and patient satisfaction. This will minimize problems like caries, periapical pathology, periodontal diseases and occlusal disharmony.

REFERENCES

1. Aparna, S., Akshay, D., Kiran, P., Abhay, K., Pratik, P., & Manika, S. (2016). Talons Cusp on the Labial Aspect of Permanent Teeth. *World J Pharmacy Pharmaceutical Sciences*, 5(6), 852-862.
2. Radhika, M. B., Paremala, K., Sudhakara, M., & Soumya, M. (2014). Talons Cusp A Report of Seven Cases and Review of Literature. *World J Dent*, 5(1), 76-79.
3. Kalpana, R., & Thubashini, M. (2015). Talon Cusp: A Case Report and Literature Review. *Oral & Maxillofacial Pathology Journal*, 6(1), 594-596.
4. Mitchell, W. H. (1892). Case report. *Dent Cosmos*, 34, 1036.
5. Mellor, J. K., & Ripa, L. W. (1970). Talon cusp: a clinically significant anomaly. *Oral Surgery, Oral Medicine, Oral Pathology*, 29(2), 225-228.
6. Lee, D. C. K., King, P. N., Lo, P. E., & Cho, D. S. Y. (2006). Talon cusp in the primary dentition: literature review and report of three rare cases. *Journal of Clinical Pediatric Dentistry*, 30(4), 299-305. doi: 10.17796/jcpd.30.4.1v1rk3053n018h84.
7. Dumančić, J., Kaić, Z., Tolj, M., & Janković, B. (2006). Talon cusp: a literature review and case report. *Acta stomatologica Croatica: International journal of oral sciences and dental medicine*, 40(2), 169-174.
8. Hattab, F. N., Yassin, O. M., & Al-Nimri, K. S. (1996). Talon cusp in permanent dentition associated with other dental anomalies: review of literature and reports of seven cases. *ASDC journal of dentistry for children*, 63(5), 368-376.
9. Guven, Y., Kasimoglu, Y., Tuna, E. B., Gencay, K., & Aktoren, O. (2016). Prevalence and characteristics of talon cusps in Turkish population. *Dental Research Journal*, 13(2), 145-150. doi: 10.4103/1735-3327.178200.
10. Prabhu, R. V., Rao, P. K., Veena, K. M., Shetty, P., Chatra, L., & Shenai, P. (2012). Prevalence of Talon cusp in Indian population. *Journal of Clinical and Experimental Dentistry*, 4(1), e23-7. doi: 10.4317/jced.50650.
11. Mohan, R. P. S., Verma, S., Singh, U., Agarwal, N., Ghanta, S., & Tyagi, K. (2013). Talon cusp in primary dentition: A case report. *Int J Case Rep Imag*, 4, 1-2.
12. Thirumalaisamy, E., Baskaran, P., Jeyanthi, K., & Kumar, S. (2012). Talon cusp in fused teeth: a rare concomitant occurrence. *Journal of Oral and Maxillofacial Pathology: JOMFP*, 16(3), 411-413.
13. Shafer, W. G., Hine, M. K., & Levy, B. M. (1983). A textbook of oral pathology. 4th ed. Philadelphia: WB Saunders; p. 40-1.
14. Inderchand, B., Dave, B., Kariya, P., & Shah, L. (2022). True talon cusp associated with cleft lip and palate: A rare case report. *Archives of Medicine and Health Sciences*, 10(1), 95-98. DOI: 10.4103/amhs.amhs_49_22.
15. Kar, S. (2016). A bilateral caries invasion in a talon cusped tooth, *Int J Current Research*, 8(5), 31788-31790.
16. Maia, R. A. D. S., Souza-Zaroni, W. C. D., Mei, R. S., & Lamers, F. (2015). Talon cusp type I: Restorative management. *Case Reports in Dentistry*, 2015, 425979. doi: 10.1155/2015/425979.
17. Ozcelik, B., & Atila, B. (2011). Bilateral palatal talon cusps on permanent maxillary lateral incisors: a case report. *European journal of dentistry*, 5(01), 113-116.