

Case Report

Dental Management of a Talon Cusp on a Primary Incisor

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Abstract: There are many treatment options for the pediatric patient with a talon cusp (TC). The purpose of this paper was to report the case of a TC involving a primary maxillary right central incisor in a 14-month-old male causing displacement of the affected tooth. The etiology of a TC is thought to be a disturbance during the morphodifferentiation stage of tooth development. Clinical problems include: (1) occlusal interferences; (2) esthetic disturbances; (3) accidental cusp fracture; (4) tongue irritation; (5) nursing difficulty; (6) caries; and (7) displacement of the affected tooth. The TC affecting the central incisor was reduced over a period of 4 visits, followed by immediate placement of a 5% sodium fluoride varnish at the conclusion of each reduction visit. Restoration of esthetics and function was evident within 1 month following complete cusp reduction. There were no clinical signs of any problems related to the reduction, and the prognosis was considered to be guarded. The pediatric patient was placed on a 6-month oral hygiene maintenance follow-up. (*Pediatr Dent* 2007;29:51-55)

KEYWORDS: CASE REPORT, PRIMARY CENTRAL INCISOR, TALON CUSP, DENTAL DEVELOPMENT

The talon cusp (TC) is a cusp-like accessory structure varying in size from prominent cingula to marked projections affecting the lingual surfaces of maxillary or mandibular teeth. It has been suggested that disturbances during morphodifferentiation might affect the tooth's size and shape.¹⁻⁴ Radiographically, a TC is visible as 2 radiopaque lines converging from the cervical area of the affected tooth toward the incisal margin. Histologically, this extra cusp is composed of normal enamel and dentin and may or may not contain pulp tissue.⁴ This developmental anomaly may cause multiple clinical problems, such as: (1) occlusal interferences; (2) esthetic disturbances; (3) accidental cusp fracture leading to loss of pulp vitality; (4) irritation of tongue during speech and mastication; (5) nursing difficulty; (6) caries; and (7) displacement of the affected tooth.⁵

The incidence of talon cusps varies considerably among populations, ranging from less than 1% to 8%.⁵ Increased incidence of talon cusps has been observed in patients with: (1) orofacial digital II syndrome; and (2) Rubinstein-Taybi syndrome. Talon cusps are also associated with other odontogenic anomalies, such as: (1) peg laterals; (2) super-

numerary teeth; (3) dens evaginatus; (4) agenesis; and (5) impactions.^{6,7} There seems to be a higher predilection for occurrence in males, with a male to female ratio of 16:9.⁴ The occurrence of a TC is reported to be 3 times higher in the permanent dentition, and almost 92% of the affected teeth in the permanent dentition have been found in the maxilla.¹ Among these teeth, lateral incisors are most frequently involved, followed by central incisors and canines.¹



* Figure 1. Patient exhibits talon cusp on maxillary primary right central incisor.

Twenty cases of primary central incisor talon cusps have been reported in the literature. Table 1 tabulates a summary of those cases, including this case. Depending on initial pre-

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Table 1. TABULATION OF CASES OF TALON CUSP AFFECTING THE PRIMARY CENTRAL INCISOR

AUTHOR	YEAR	SEX	AGE	MEDICAL / DENTAL HISTORY	DIAGNOSIS / TREATMENT	OUTCOME
Yoon RK and Chussid S*	2006	M	14 mos	Unremarkable	Occlusal interference/ reduction	Normal occlusal function, improvement in affected tooth alignment
Tsai AI and Chang P ⁸	2003	F	13 mos	Unremarkable	Trauma / pulpectomy	Normal occlusal function and normal root resorption
Güngör HC et al ⁵	2000	M	14 mos	Unremarkable	Occlusal interference/ reduction	Trauma/extraction
Hattab FN and Yassin OM ⁹	1996	M	17 mos	Supernumerary	Occlusal interference/ reduction	Did not return for appointment
Liu JF and Chen LR ¹⁰	1995	F	12 mos	Unremarkable	Trauma / extraction	Not reported
Liu JF and Chen LR ¹⁰	1995	F	12 mos	Unremarkable	Fissure / sealant	Not reported
Liu JF and Chen LR ¹⁰	1995	F	3½ ys	Unremarkable	Caries / restoration	Not reported
Liu JF and Chen LR ¹⁰	1995	F	3½ ys	Unremarkable	Caries / extraction	Not reported
Meon R ¹¹	1990	M	4 ys	Unremarkable	Caries / crown	Not reported
Morin CK ¹²	1987	M	12 mos	Unremarkable	Fissure / sealant	Not reported
Chen RJ and Chen HS ¹³	1986	M	10 mos	Unremarkable	Not reported	Not reported
Chen RJ and Chen HS ¹³	1986	F	6½ ys	Unremarkable	Not reported	Not reported
Chen RJ and Chen HS ¹³	1986	M	9 mos	Unremarkable	Occlusal interference/ reduction	Not reported
Chen RJ and Chen HS ¹³	1986	M	13 mos	Unremarkable	Normal occlusion/ not indicated	Not reported
Chen RJ and Chen HS ¹³	1986	M	4 ys	Unremarkable	Not reported	Not reported
Chen RJ and Chen HS ¹³	1986	M	6 ys	Unremarkable	Not reported	Not reported
Davis PJ and Brooke AH ⁴	1986	M	5 ys	Hypoxia	Caries / extraction	Not reported
Davis PJ and Brooke AH ⁴	1986	M	Not reported	Family history; Supernumerary and TC	Occlusal interference/ not reported	Not reported
Natkin E et al ¹⁴	1983	Not reported	Not reported	Not reported	Not reported	Not reported
Mass E et al ¹⁵	1978	M	1 y	Unremarkable	No fissures, noncarious/ no treatment	Not reported
Henderson HZ ¹⁶	1977	F	4 ys	Unremarkable	Caries / pulpectomy	Not reported

* Present case report.

sensation, treatment modalities of the TC have included:

1. observation;
2. gradual, periodic reduction of the cusp with placement of a fluoride varnish as a desensitizing agent;
3. sealants for susceptible fissures;
4. pulpectomies;

5. resin crowns; and

6. extractions.^{4,5,8-16}

Of the cases where reduction of the central incisor was recommended, one resulted in a traumatic event and a complicated crown fracture, one never returned for periodic reduction appointments, and 2 outcomes were not reported.^{4,5,9,13}

The purpose of this report was to illustrate the case of a talon cusp on a primary maxillary right central incisor in a 14-month-old patient. The dental and radiographic findings are reported. A successful response to treatment is illustrated with changes in the clinical appearance of the affected tooth and its relationship within the maxillary arch.

Case report

A 14-month-old Hispanic male patient presented to the pediatric dental service for an initial evaluation. The parent reported an unaesthetic appearance and an abnormal shape of the central incisor. The patient's medical history was unremarkable. Clinical examination of the oral cavity revealed normal soft tissue and normal development of the primary dentition and an overbite of 100%. The well-defined, prominent TC projected from the lingual surface of the central incisor, causing an anterior tooth displacement of approximately 4 mm. As demonstrated in Figure 1, the TC extended over one-half the distance from the cemento-enamel junction to the incisal edge and shallow developmental grooves were present on either side of the TC.

Radiographic evaluation showed an inverted, well-defined, V-shaped radiopaque structure arising from the cingulum of the central incisor with its pulpal extension (Figure 2). The tooth was asymptomatic. The anomaly, however, did interfere with occlusion, with the TC incisal edge occluding on the lower central incisor. The authors were concerned with the occlusal interference and increased trauma susceptibility due to anterior displacement of the affected tooth. Recommendations were made to gradually reduce the cusp to prevent fracture and possible exposure of the pulp tissue.

Approximately 2 mm of tooth structure was reduced with a football-shaped fine diamond bur on a high-speed hand-piece with copious irrigation over a period of 4 visits. About 6 weeks were given between each visit to allow for formation of tertiary dentin. Five percent sodium fluoride varnish (Cavity Shield, Omnia Oral Pharmaceuticals, West Palm Beach, Fla) was applied to the tooth structure's lingual surface to reduce any tooth sensitivity, and oral hygiene was reinforced. Figure 3 demonstrates that complete reduction of the cusp was achieved without pulp exposure. It was estimated that there was a remaining dentin thickness of approximately 3 mm. A finishing bur was used on the lingual aspect to ensure a smooth, polished surface. Total time of treatment for complete reduction was approximately 6 months.

Figure 4 illustrates the occlusion 1 month after reduction of the TC. At this examination no adverse signs or symptoms were noted. The central incisor appeared to have shifted lingually into the arch after removing the occlusal interference with an overjet of 2 mm. The parent reported no difficulties in chewing and was pleased with the esthetic result. Subsequent radiographic examinations of the central incisor were



Figure 2. Radiographic appearance of talon cusp with classic v-shaped radiopacity.

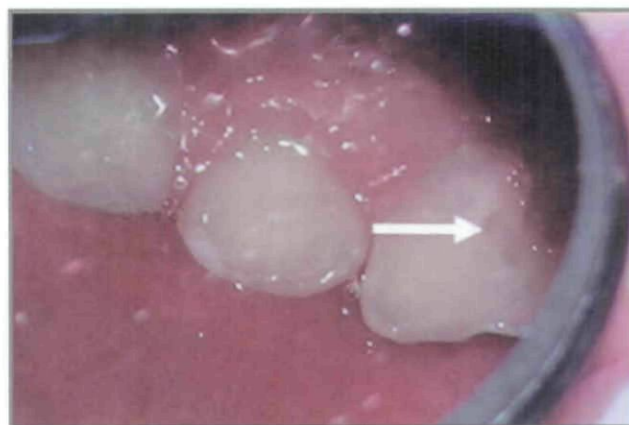


Figure 3. Clinical photograph after complete talon cusp reduction.



Figure 4. Clinical photograph demonstrating improvement in maxillary arch alignment.

recommended, and the patient was scheduled for routine oral hygiene maintenance visits.

Discussion

The present report details the features of a healthy pediatric patient who presented with a TC on primary central incisor. The pediatric patient had no associated syndromes or odontogenic anomalies. Gradual reduction of the cusp may be a useful method of treating talon cusps to avoid occlusal interferences and increased susceptibility to complicated fractures secondary to trauma resulting in pulp exposure. Due to the 4-mm anterior displacement of the central incisor, the authors were concerned with increased risk of trauma and fracture of the TC, especially during the pediatric patient's formative years.

The central incisor's prognosis in the present case is guarded. Tertiary dentin is formed in response to mild to moderate stimuli, such as TC reduction, and is highly variable.¹⁷ According to Stanley et al, the rate of tertiary dentin formation is approximately 1.49 $\mu\text{m}/\text{day}$ and begins 19 days after operative procedures.¹⁸ Klinge RF showed that the pulp reacts to stimuli by formation of tertiary dentin on the pulpal aspect of the stimulated dentinal tubules in human deciduous teeth in an attempt to wall off the irritating agent.¹⁹ Murray et al found that tertiary dentinogenesis is most sensitive to remaining dentin thickness.²⁰ In this case, the remaining dentin thickness was approximately 3 mm, which would lead to less cellular injury and tertiary dentin formation. Furthermore, repair events may vary in response to different dental materials utilized post TC reduction.¹⁹

Special considerations for further protection of the dentin beyond fluoride varnish may include: (1) bonding agents; or (2) restorations with resin modified glass ionomers, composites, or composites. Shey and Eytel treated this anomaly on a permanent central incisor by gradual reduction of the TC on a 4-week periodic schedule.²¹ The TC was completely reduced in 8 visits, and the dentin was lined with calcium hydroxide and restored with composite. The authors in this present case report utilized a similar approach with the application of a fluoride varnish. Due to the patient's age, cooperation, and asymptomatic central incisor, a bonding agent was not utilized.

Early diagnosis and treatment is important, especially during the patient's formative years. Treatment objectives for taloned teeth include: (1) preserving pulp vitality; (2) meeting esthetic and occlusal requirements; (3) establishing caries prevention or eradication of developmental grooves; and (4) eliminating tongue irritation. Treatment may differ, depending on each case. Small talon cusps are usually asymptomatic, necessitating no treatment. Large prominent talon cusps call for definitive treatment, however, because they may cause esthetic, occlusal, and anterior tooth displacement, as in this case.

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Abstract of the Scientific Literature

Rubber Dam Use by Specialists

The aim of this study was to assess the prevalence of the use of rubber dam by pediatric dental specialists working within the UK. A questionnaire was sent to 215 UK pediatric dental specialists of which 75% replied. The majority of the respondents worked within the publicly funded National Health Service (85%). The results indicated that the younger specialists and residents in training were the highest users of rubber dam. When the results were pooled for all modes of restorative care, rubber dam was used regularly, almost always, or always in 46% of non-sedation or in-house sedation cases and 49% of general anesthetic cases. Interestingly, it was reported that even in procedures such as endodontics, rubber dam was not always used. The most likely reason reported for non-use of rubber dam was lack of patient cooperation. The authors concluded that although the use of rubber dam is recommended, there is a wide variability and under use of rubber dam.

Comments: This article provides insight into the under use of rubber dam use by specialists and indicates that even though specialists advocate its use, they themselves may not be using it as frequently as has been suggested. EKM

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Soldani F and Foley J. An assessment of rubber dam usage amongst specialist in paediatric dentistry practicing within the UK. *Int J Paed Dent* 2007; 17: 50-56.
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Abstract of the Scientific Literature

Midline Correction with Rapid Maxillary Expansion

The purpose of this study was to investigate two methods for correcting upper dental midline shift by physiologic movement of the incisors during the retention period of rapid maxillary expansion. Data were collected from 32 patients with upper midline shifts due to constriction and anterior crowding. Radiographic review and clinical examination verified that midline shifts were due to crowding only and were not functional. Patients were randomly divided into two groups. Both groups utilized acrylic cap splint expansion appliances. Method 1 utilized acrylic coverage of all the dentition except the incisors and the canine on the shifted side. Post expansion, the incisors on the shifted side were allowed to move to the midline while the incisors on the other side were held by the acrylic cap. Method 2 utilized acrylic coverage of only the posterior teeth. Post expansion, the incisors on the shifted side were allowed to move toward the midline diastema, whereas those on the other side were held in place by ligation of the brackets placed immediately after expansion. In both groups, midline correction occurred by movement of the shifted teeth toward the diastema without orthodontic force. Researchers concluded that residual or unwanted forces produced during rapid maxillary expansion can be used to correct an upper dental midline shift.

Comments: Unwanted physiologic forces produced during rapid maxillary expansion can be used to benefit treatment and shorten chair time. RKY
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