# Management of Dens Evaginatus in Premolars: A Case Series

Mimansa Cholera MPH, DDS, Omid Mirfendereski DDS, Thomas Tanbonliong DDS, Ling Zhan PhD, DDS
Department of Orofacial Sciences, Division of Pediatric Dentistry, University of California, San Francisco

UCSF School of Dentistry

## Introduction

- Dens evaginatus (DE) is a dental developmental anomaly characterized by the presence of an accessory cusp, or tubercle, on the occlusal surfaces of posterior teeth or the lingual surfaces of anterior teeth.[1]
- DE tubercles have an outer enamel layer and middle dentin layer covering a thin inner layer of pulpal tissue.[1]
- DE in anterior teeth is also termed talon cusp. DE in posterior teeth is also termed tuberculated or interstitial cusp, occlusal enamel pearl, or evaginated odontoma.[1]
- Posterior DE tubercles are commonly found on the mandibular second premolars.[1]

## Epidemiology

- DE prevalence ranges from less than 1% to more than 4%.[1]
- DE is most prevalent among Asian, American Indian, and Alaskan Native populations, which have historical gene flow interactions.[1]

## Etiology

- The exact etiology of dens evaginatus is unclear, although autosomal and X-linked dominant inheritances have been proposed.[1]
- The morphological aberration occurs during the bell stage of tooth development.[1]
- The anomaly results from an abnormal proliferation and folding of the inner enamel epithelium and dental papilla into the stellate reticulum of the enamel organ.[1]

## Clinical Features and Complications

- Anterior DE tubercles may be up to 6mm in length. Posterior DE tubercles are generally smaller, being 2mm in width and 3mm in height.
- DE tubercles may cause occlusal and functional interference with the opposing teeth which can lead to fracture of the tubercles and exposure of the thin pulpal extensions, resulting in pulpal and periapical inflammation.[2]
- Malocclusion, increased tooth mobility, and temporomandibular joint (TMJ) pain may be other potential consequences of DE. TMJ pain may be attributed to occlusal trauma associated with DE.[3]
- Early diagnosis and management are important to prevent occlusal interferences, fracture, and eventual periapical pathosis in teeth with DE.

## Case 1

13 yo Hispanic female S. C. presented for new patient exam at UCSF in Aug 2022 with abscessed #20.
Exam revealed crater on #20 where DE tubercle fractured. #20 had draining fistula and 6/10 pain on palpation and percussion.

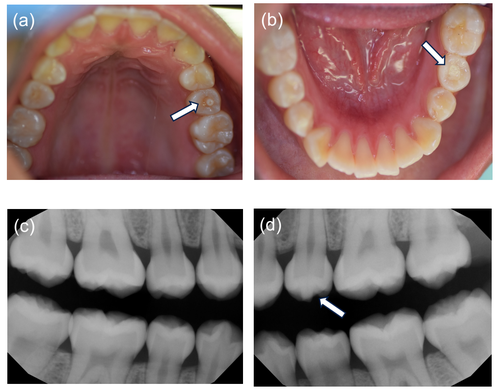


**Figure 1. Pre-operative photos & radiographs for S. C.** (a) Upper arch with intact DE tubercle on #13 (arrow). (b) Lower arch with fractured DE tubercle on #20 (arrow). (c) Right BW radiograph. (d) Left BW radiograph with intact DE tubercle on #13. (e) Lower left periapical radiograph depicting radiolucency around #20 apex.

Exam also revealed DE tubercle #13.

Radiographs revealed #20 periapical radiolucency.

#20 Dx: pulpal necrosis with chronic apical abscess

#20 Tx Plan: NSRCT and SSC

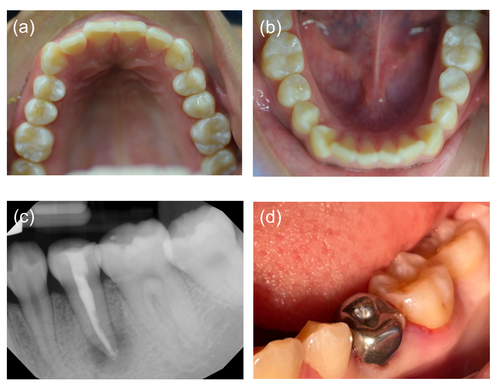


**Figure 2. Post-operative photos & radiographs** (a) Upper arch. #13 DE tubercle reinforced with composite. (b) Lower arch. #20 features temporary restoration post NSRCT completed at UCSF Endodontics clinic. (c) Lower left periapical radiograph post #20 NSRCT. (d) Post-op photograph of #20 SSC restoration

Patient got #20 NSRCT completed at UCSF Endo in Sep 2022. Patient returned for sealants and composite restorations to reinforce other premolars with DE in Oct 2022.

Patient got #20 SSC completed at UCSF Peds in Mar 2023.

## Case 2

12 yo Hispanic female M. C. presented for new patient visit at UCSF in Aug 2022 without complaints.
Exam revealed multiple premolars with DE, most visible in the mandibular arch.

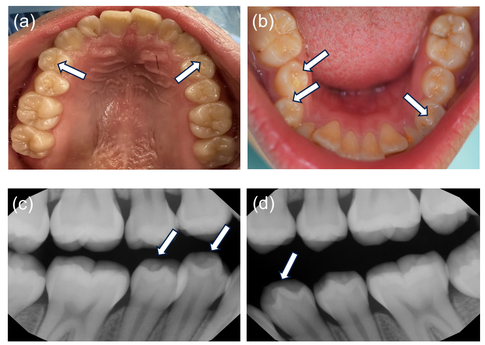


**Figure 3. Pre-operative photos & radiographs for M. C.** (a) Upper arch with DE tubercles on #5 and #12 (arrows). (b) Lower arch with DE tubercles on #21, #28, & #29 (arrows). (c) Right BW radiograph with DE tubercles on #28 & #29 (arrows). (d) Left BW radiograph with DE tubercle on #21 (arrow).

Tx plan to reinforce all DE tubercles with flowable composite. Patient returned for composite restorations to reinforce all premolars with DE in Oct 2022.

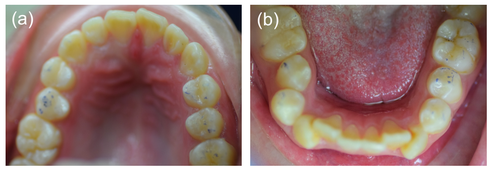


**Figure 4. Post-operative photos** (a) Upper arch with DE tubercles reinforced with composite. (b) Lower arch with DE tubercles reinforced with composite.

## Case 3

9 yo Asian female J. L. presented for new patient visit at UCSF in Feb 2023 without complaints. Exam revealed multiple premolars with DE.

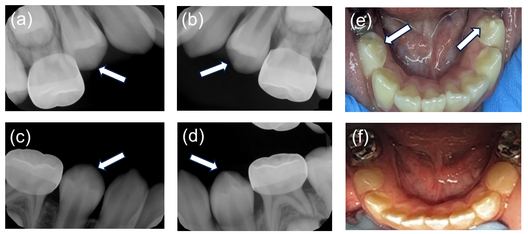


**Fig 5. Pre-operative & post-operative records for J. L.** (a-d) Pre-operative radiographs showing DE tubercles on premolars (arrows). (e) Pre-operative photo showing DE tubercles on #21 & #28 (arrows). (f) Post-operative photo showing DE tubercles on #21 & #28 reinforced with composite.

DE tubercles on #21 and #28 reinforced with composite. #5 and #12 planned for the same treatment when fully erupted.

## Treatment Options

The management of DE ranges from no treatment to preventive treatment to treatment of complications.

Preventive treatment to avoid DE fracture and pulp exposure:

- Reinforcing tubercles with composite resin may reduce the risk of fracture. This treatment is not ideal if the final restoration results in occlusal interference.[1]
- Intermittent selective serial reduction of tubercles may also reduce the risk of fracture. This treatment results in a gradual recession of the pulp via deposition of tertiary reactionary dentin.[1]
- Definitive prophylactic reduction of DE may be done with indirect, direct, or partial pulpotomy if needed.

Management of DE with fracture/pulp involvement:

- In pulpally involved but vital teeth, direct pulp cap or partial pulpotomy may be performed.[1]
- In pulpally involved necrotic teeth, apexification or regenerative endodontic treatment in the case of immature root or RCT in the case of mature root may be performed.[1]
- Extraction of pulpally involved teeth, especially in conjunction with orthodontic treatment, may be a consideration.[1]

## Conclusion

- Posterior DE tubercles are at risk of fracture, resulting in pulpal exposure and periapical infection.
- Early diagnosis via visual exam and radiographs is key to prevent complicated pulpal treatment and loss of posterior teeth with DE.
- Preventive treatment includes reinforcement of DE tubercles with composite and selective grinding of DE tubercles.
- Necrotic teeth with mature roots require RCT.
- This case series presents three cases of posterior DE, including two siblings, one of whom only required preventive treatment and one of whom required RCT and final restoration.

## References

1. Chen, J. W., Huang, G. T., & Bakland, L. K. (2020). Dens evaginatus: Current treatment options. *Journal of the American Dental Association*, 151(5), 358–367. https://doi.org/10.1016/j.adaj.2020.01.015
2. Echeverri, E. A., Wang, M. M., Chavaria, C., Taylor, D. L. (1994). Multiple dens evaginatus: Diagnosis, management, and complications: Case report. *Pediatric Dentistry*, 16(4), 314–317. https://www.aapd.org/globalassets/media/publications/archives/echeverri-16-04.pdf
3. Levitan, M. E., & Himel, V. T. (2006). Dens evaginatus: Literature review, pathophysiology, and comprehensive treatment regimen. *Journal of Endodontics*, 32(1), 1–9. https://doi.org/10.1016/j.joen.2005.10.009