

# Anomaliler ve Endodontik Yaklaşımlar

Prof Dr Uğur İNAN

# Anomali



Fark edilebilir seviyede normalden sapma durumudur



Dişsel anomaliler; diş dokularında (mine-dentin-sement) meydana gelen sapmalar sonucu oluşur.

# Dışsel Anomaliler

## İçsel Faktörler

- Metabolik disfonksiyon
- Mutasyon

## Dışsal Faktörler

- Fiziksel ve kimyasal travmalar
- Beslenme bozukluğu
- Stres
- Alışkanlıklar
- Çevre koşulları

# Sınıflandırma

✓ Sayı anomalileri

 Büyüklük (boyut) anomalileri

 Şekil anomalileri

 Doku (yapı) anomalileri

 Durum anomalileri

# Taurodontizm

İlk defa 1913 yılında Keith tarafından köklere doğru dikey yönde genişlemiş pulpa odası ihtiva eden dişlerin tanımı için kullanılmıştır

Normalden uzun bir pulpa odası ve kısa köklere sahip dişler için kullanılır

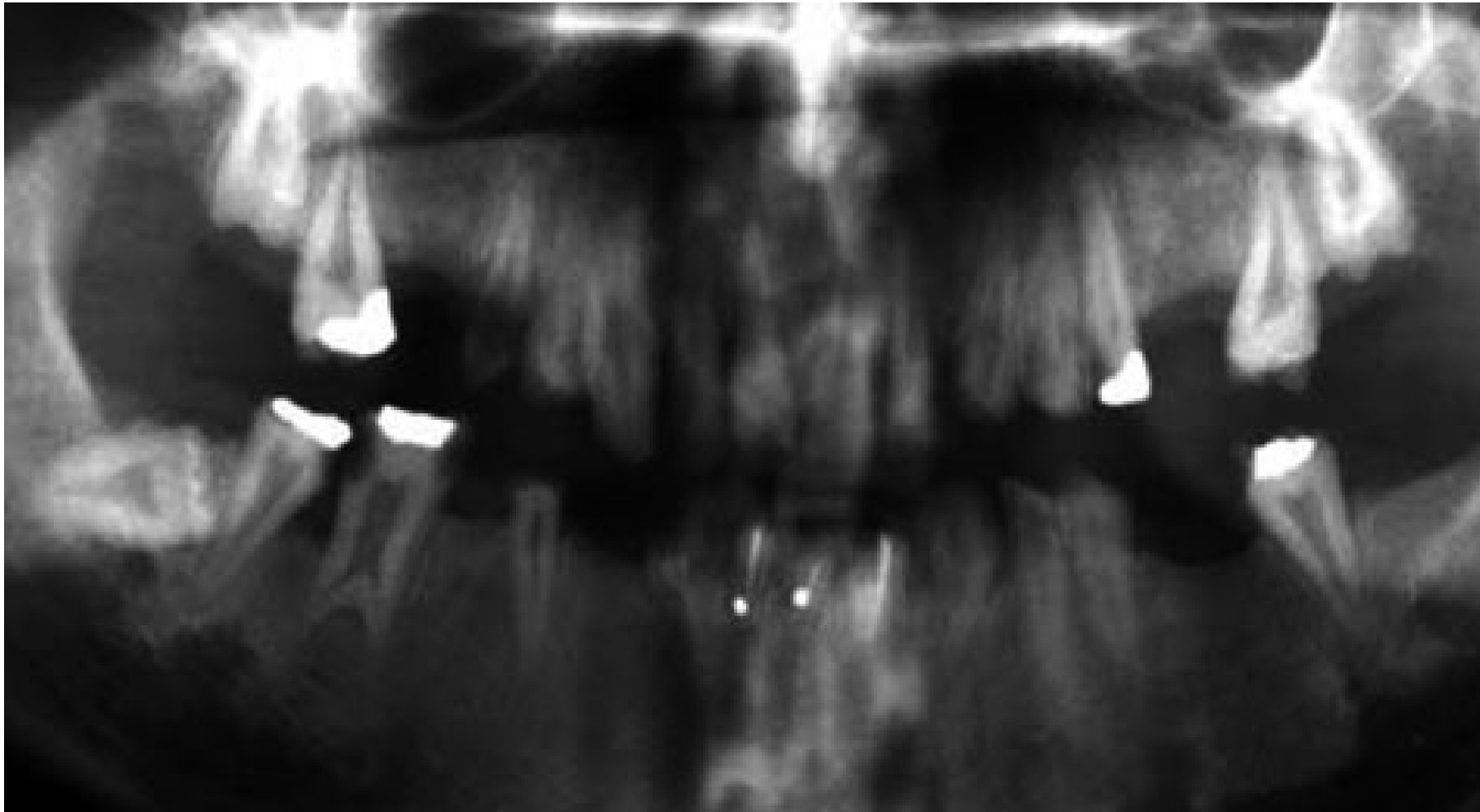
Yunanca boğa anlamına gelen tauros ile diş anlamına gelen odontismın birleşmesi ile “taurodontizm” denilmiştir

# Taurodontizm'in Özellikleri

Mine sement sınırı ile köklerin ayrıldığı nokta arasındaki mesafe uzamıştır

Koledeki girinti normal diştekinden daha az belirgindir

Pulpa odası dişin hacmine göre çok geniştir



# Taurodontizm



Genelde büyük azılarda, az da olsa keserler ve premolarlarda görülür



Taurodontizmde içi ve dış mine epiteli zamanında birleşemeyip Hertwig epitel kınının kökleri oluşturması geciktiği için pulpa odası kök ucuna kadar genişlemiştir



# Taurodontizm



Radyografda kök ucuna kadar uzamış pulpa boşluğu görülür



Kökler normalden kısadır. Köklerin kısalığı nedeniyle periodontal hastalık sonucu dişler kolayca kaybedilir



Kanal tedavisi yapmak güçtür

# Sınıflandırma

## Hipotaurodont

- Pulpa odası normalden biraz daha genişlemiştir

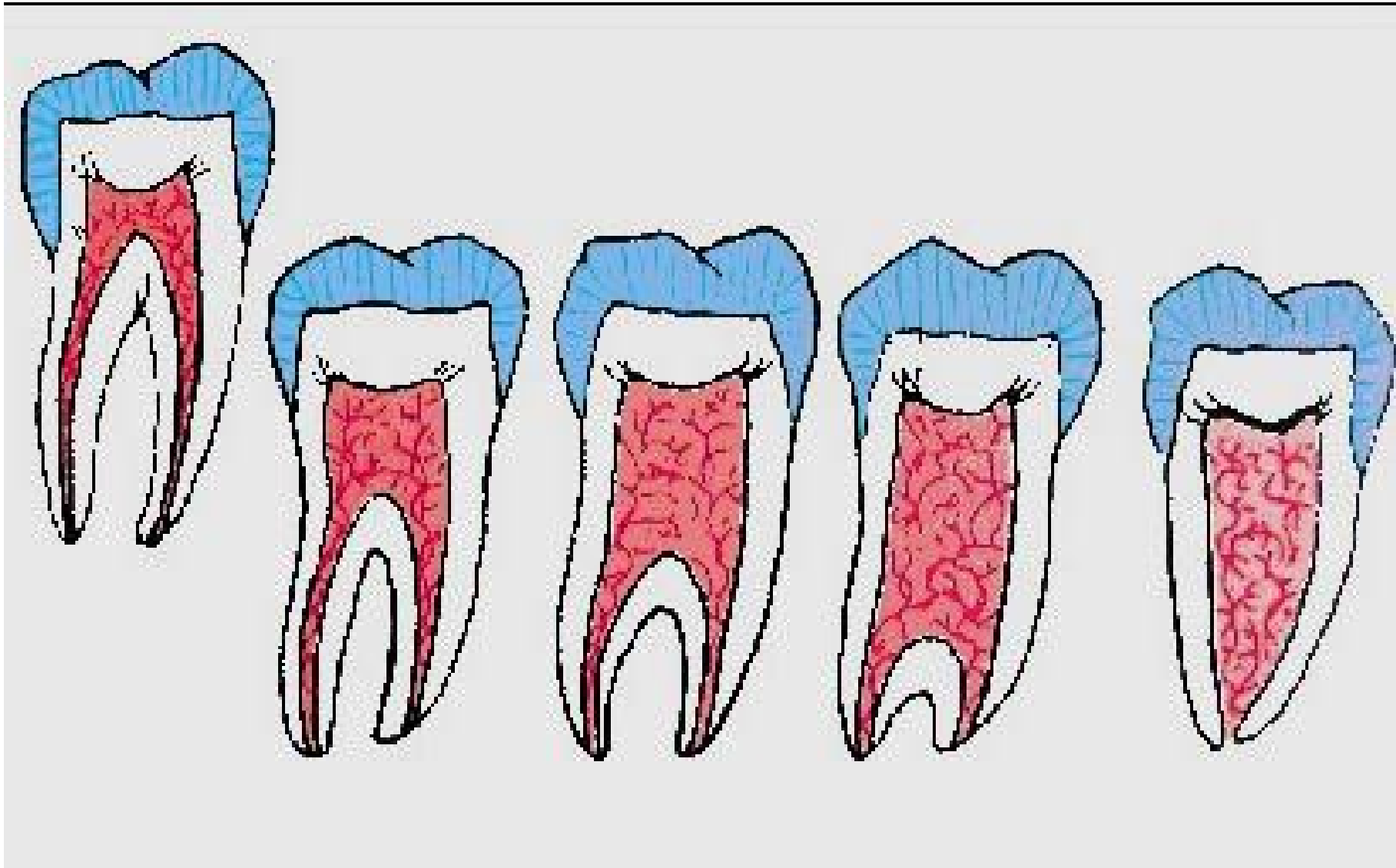
## Mesotaurodont

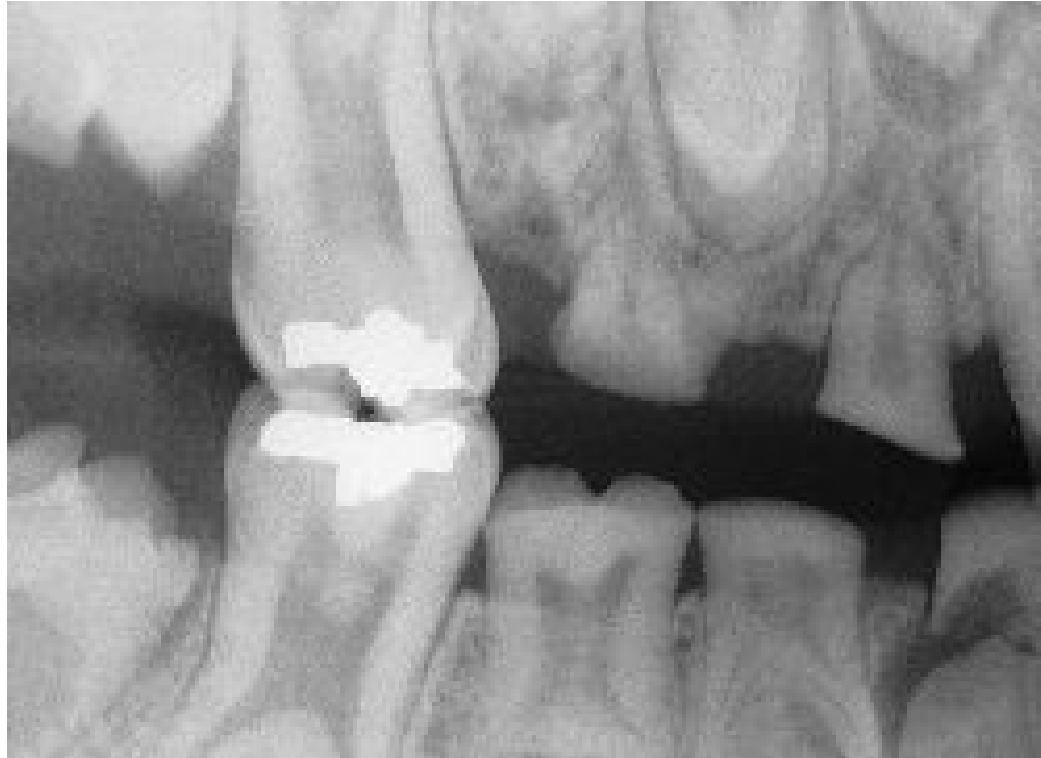
- Pulpa odası normal kök uzunluğunun ortasına kadar uzanmıştır

## Hipertaurodont

- Pulpa odası kök ucuna kadar uzanmıştır

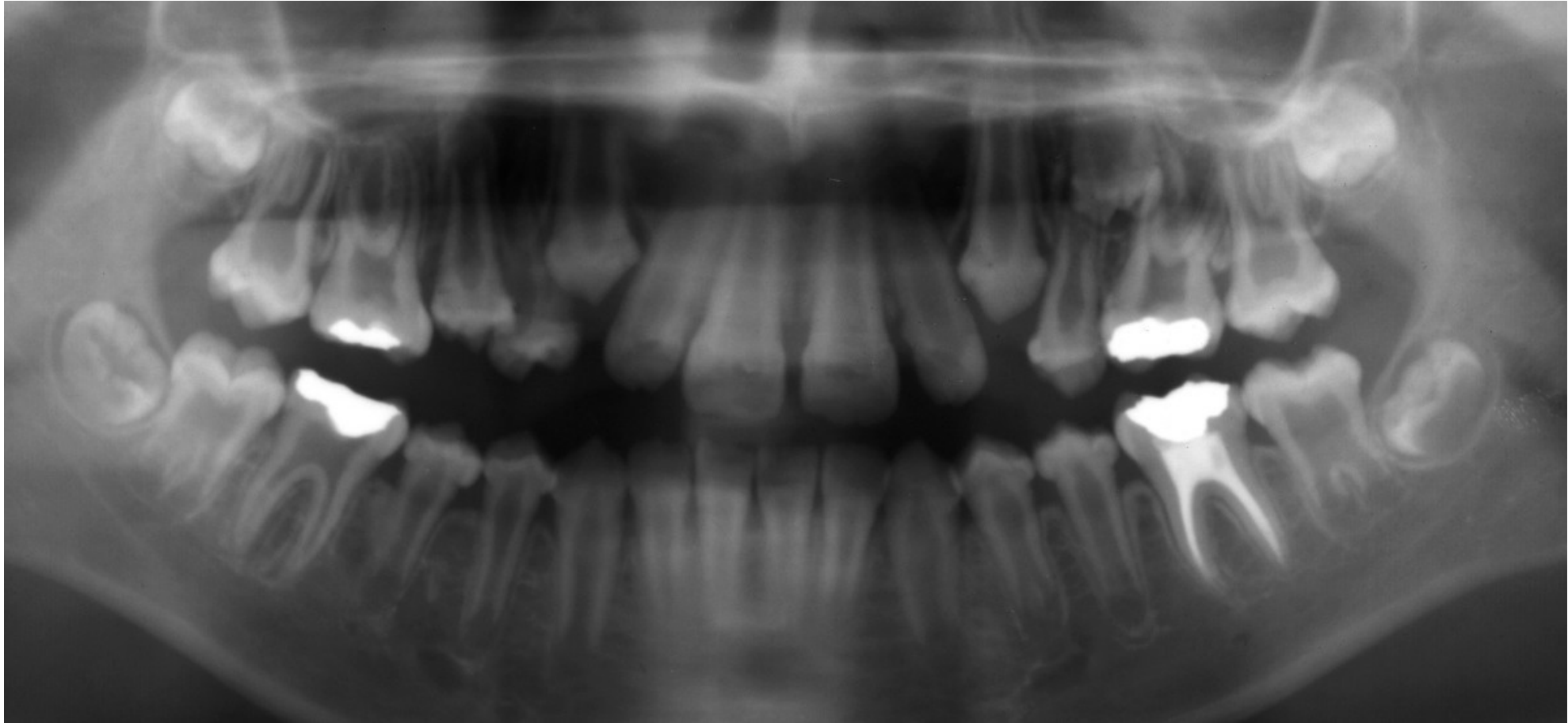




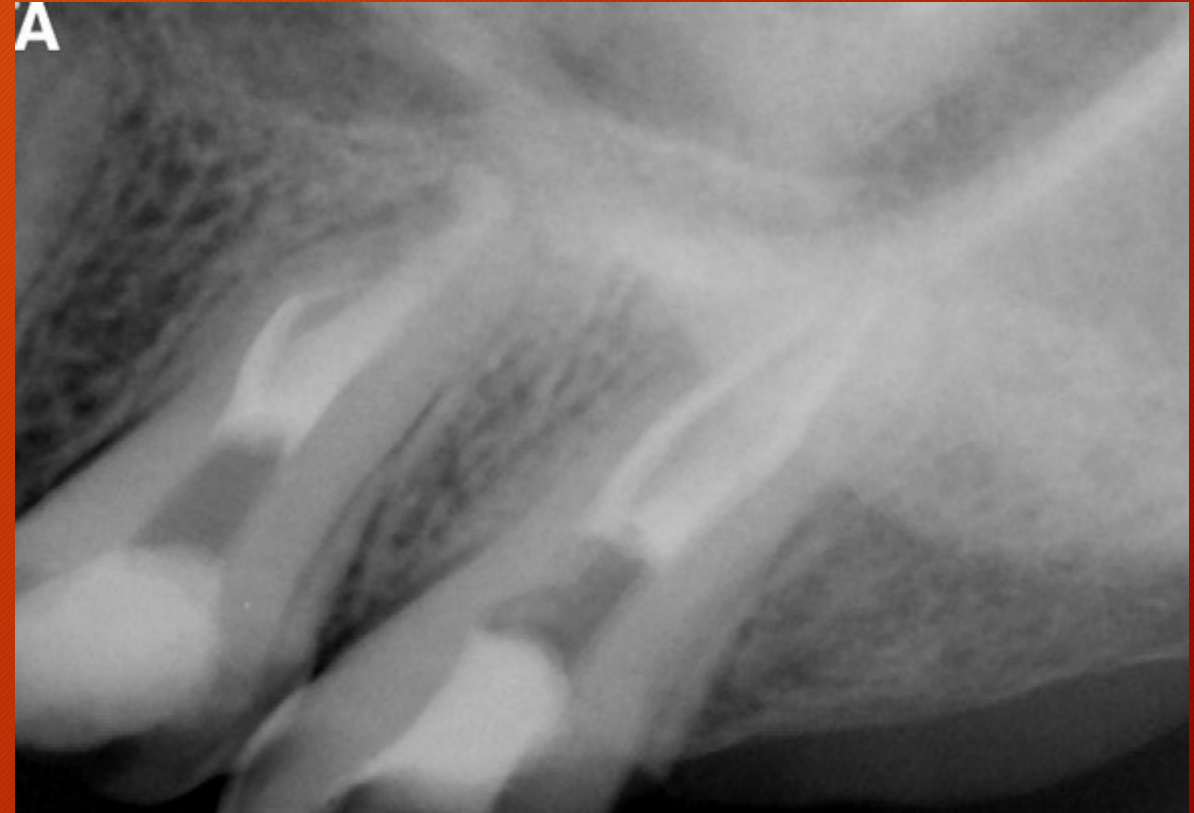


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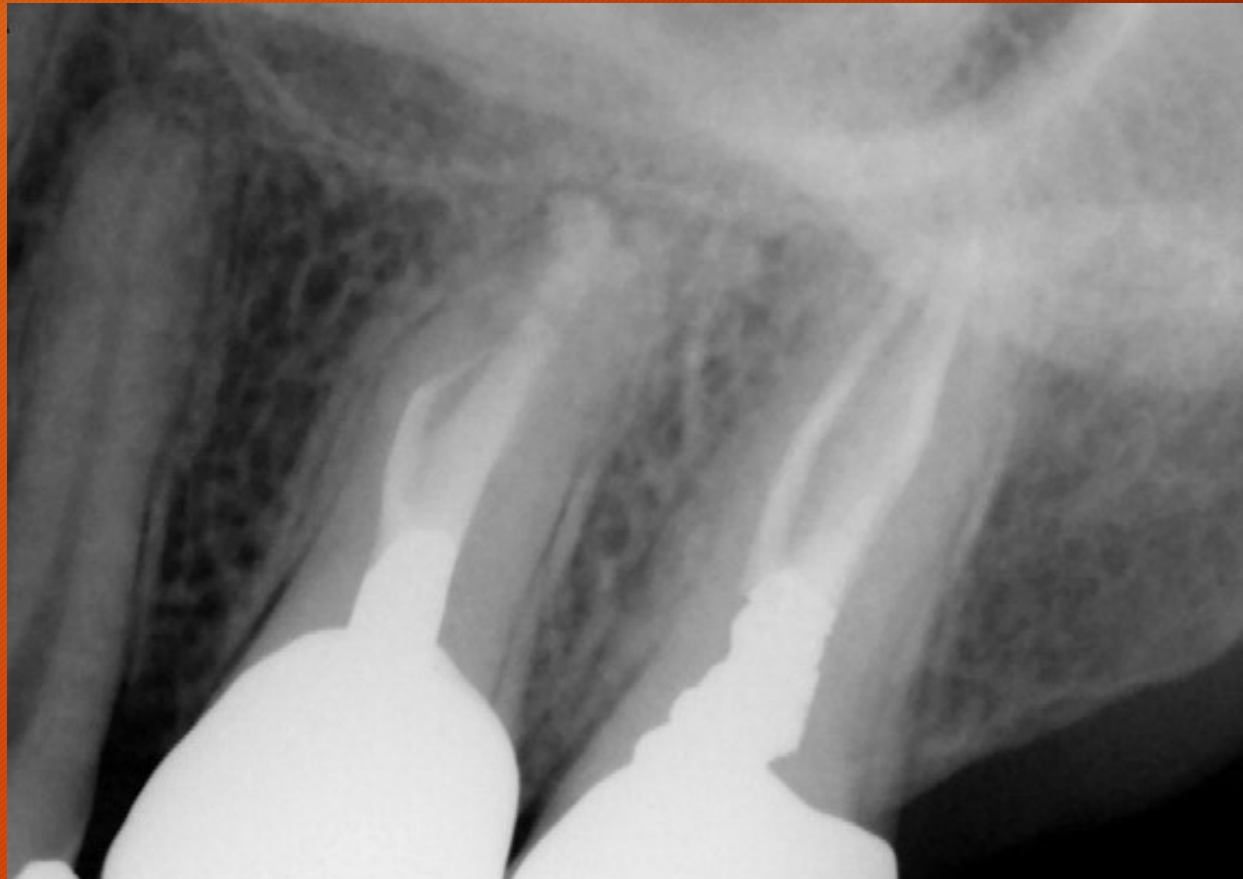
# Taurodontizm



# Hipertaurodont



# Hipertaurodont

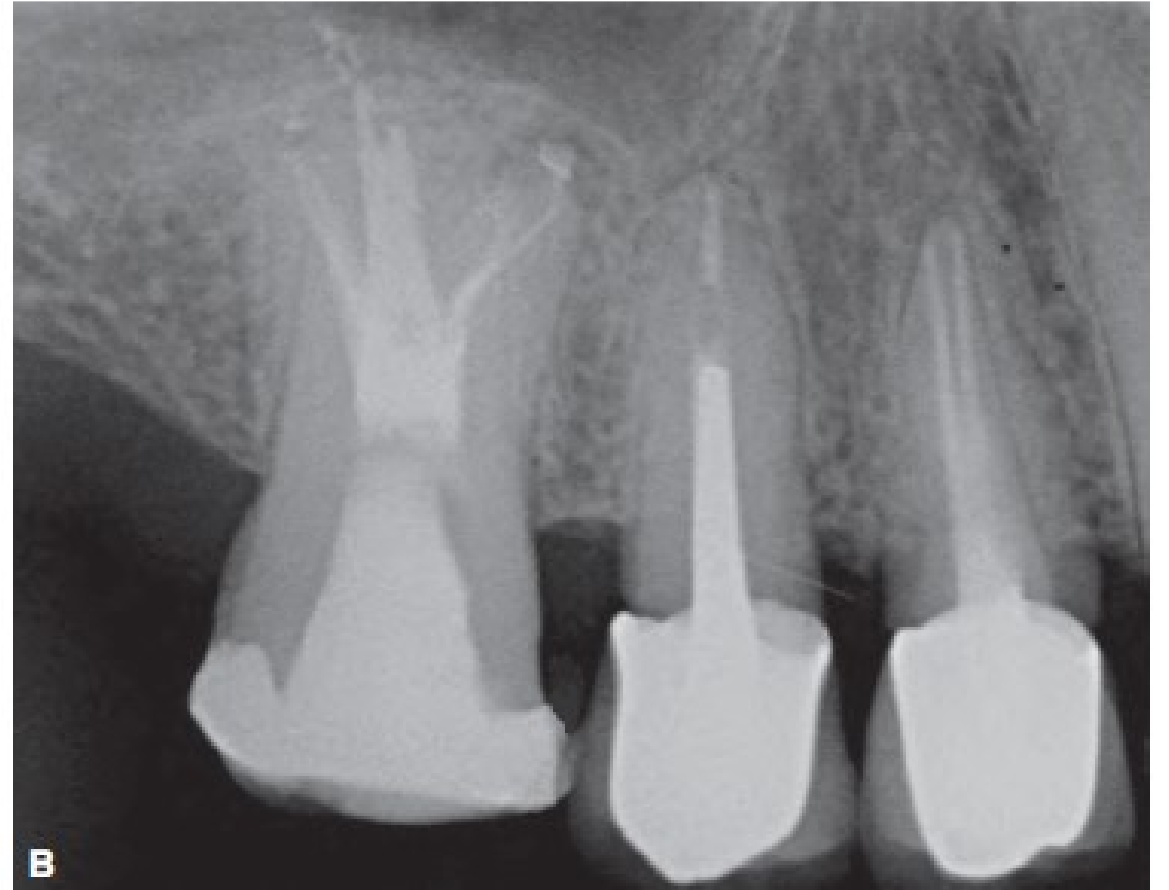
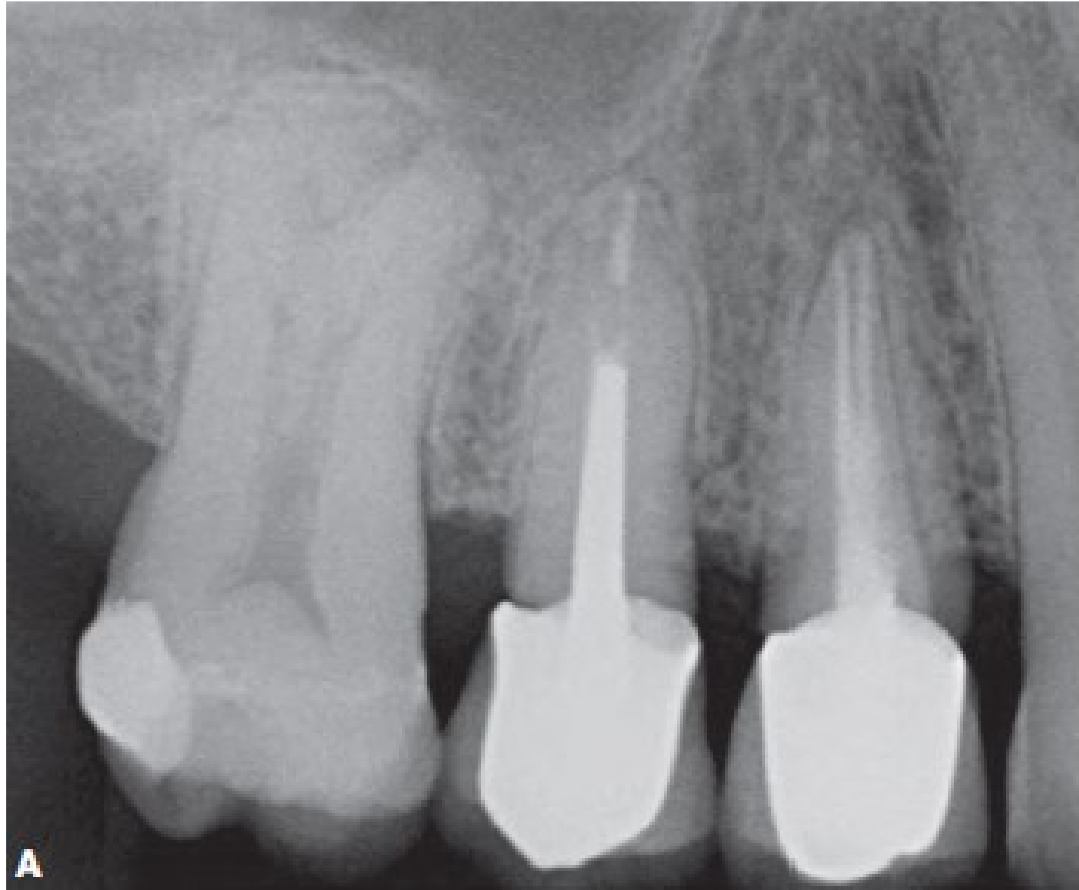


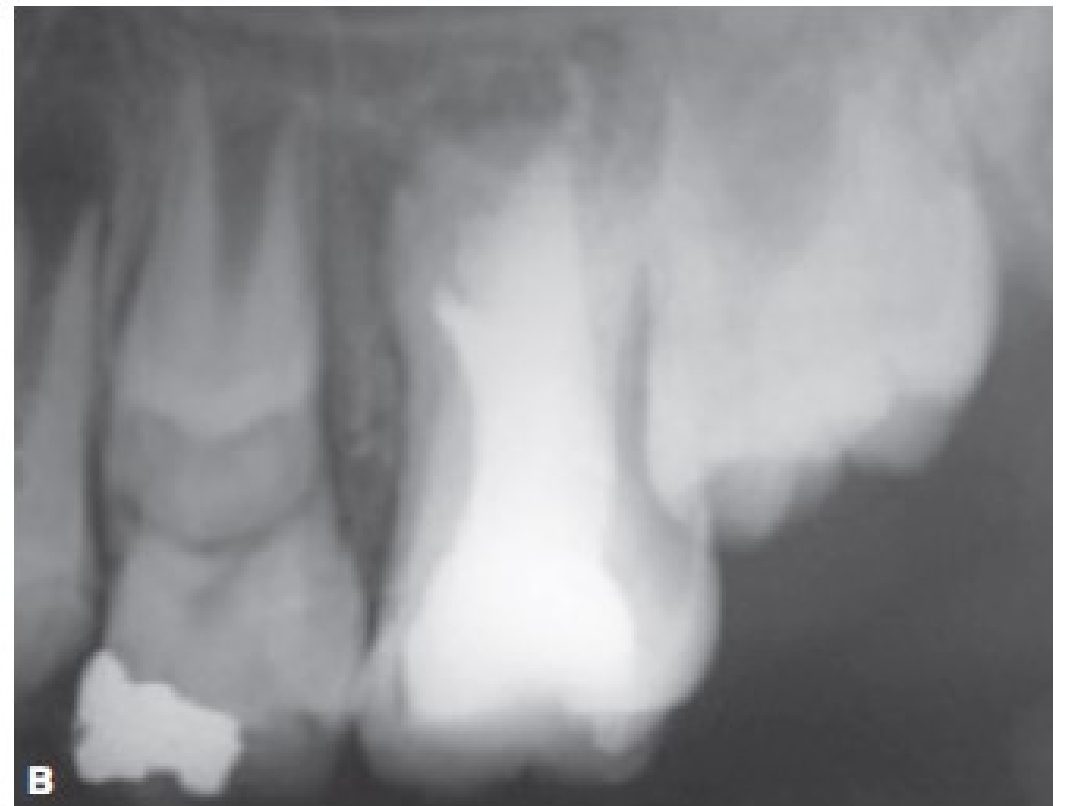
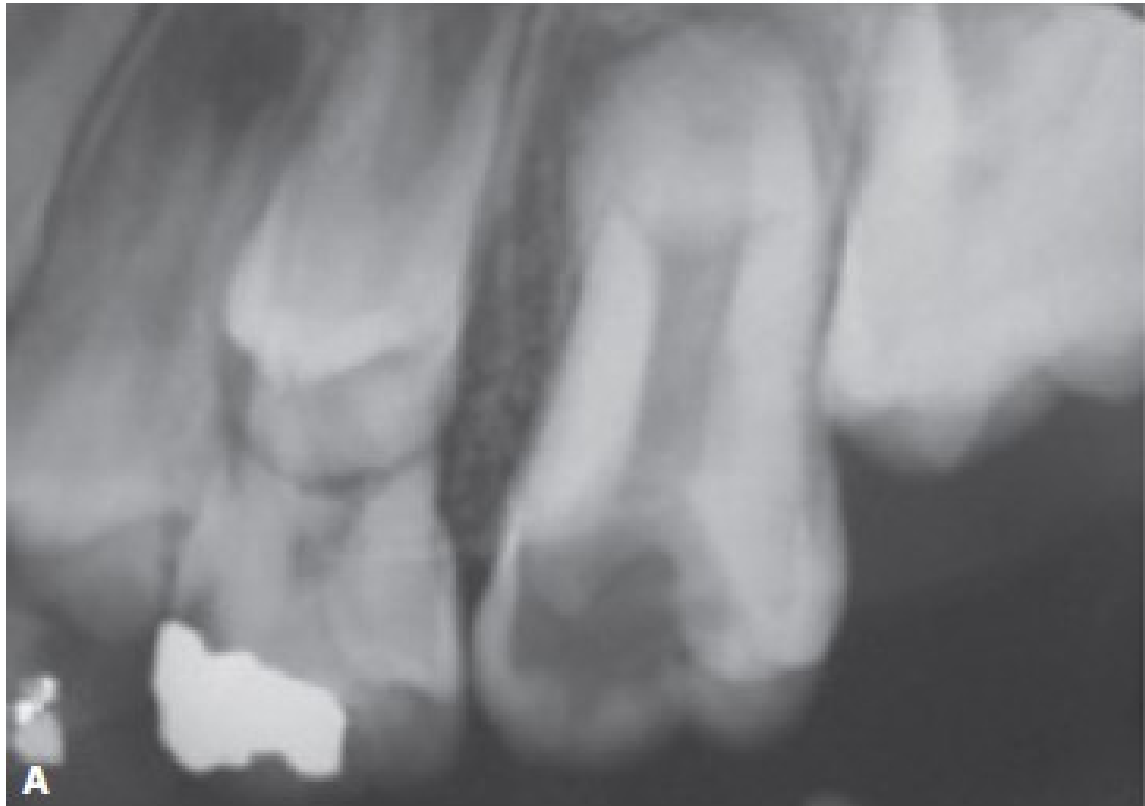












# FÜZYON



Gelişmekte olan 2 veya 3 diş germinin birleşimi ile tek bir diş oluşmasıdır.



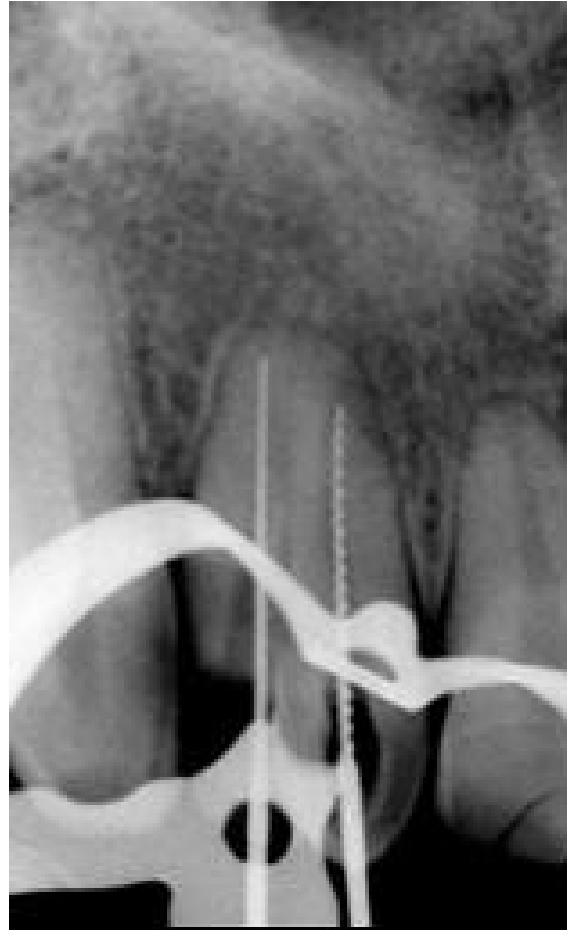
Füzyonun klinik görünümünde, dişlerin labial ve lingualinde kaynaşmayı belirleyen derin bir gelişimsel oluk ile bunun kesici kenarda bir çentik oluşturduğu izlenir.



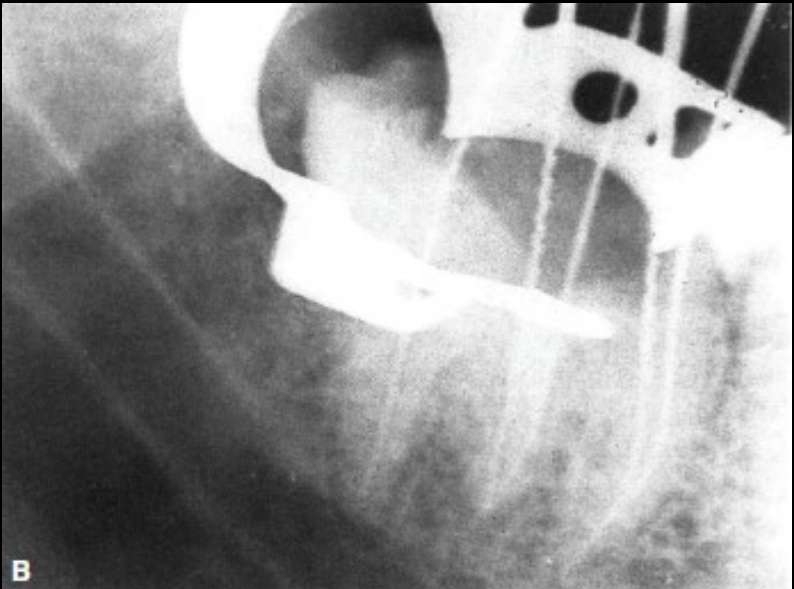
Radyograflarda kaynaşmanın sadece kron veya sadece kök dentinlerinde yada dişin tamamında olduğu gözlenebilir.













# Dens Invaginatus



Diş içinde diş de denilmektedir



Oluşumu, lokal dış kuvvetler, fokal gelişim duraklaması ve fokal gelişim stimülasyonu gibi nedenlerle açıklanmaktadır



Dens invaginatus formasyon döneminde diş germinin periferik bir bölgesinde pulpaya doğru invaginasyonu ile karakterizedir

# Dens Invaginatus

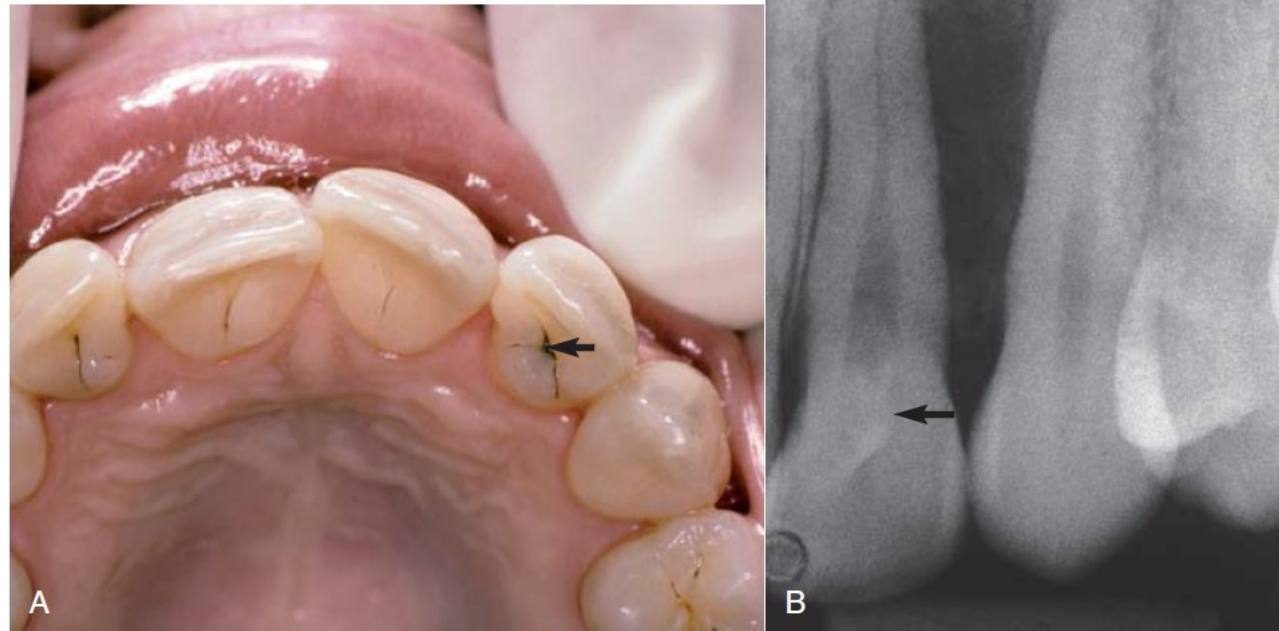
Dişler genellikle klinik olarak küçük şekilsiz kron ve kısa kök yapılarıyla karakterizedir

Radyograflarda mine ve dentinin pulpaya armut şeklinde invaginasyonu görülür

En sık üst çenede, özellikle de üst çene lateral dişte görülür

Santral, premolar ve nadiren de molar dişlerde de görülebilir





**Figure 13-15** Dens invaginatus. **A**, The invagination is visible on the lingual surface (*arrow*) of this abnormally shaped incisor. **B**, The invagination is lined internally by enamel (*arrow*). By communicating with the pulp, the exposure resulted in pulp necrosis and apical pathosis. These situations are difficult to treat. (Courtesy Dr W. Johnson.)



# OEHLER SINIFLANDIRMASI

## Tip 1

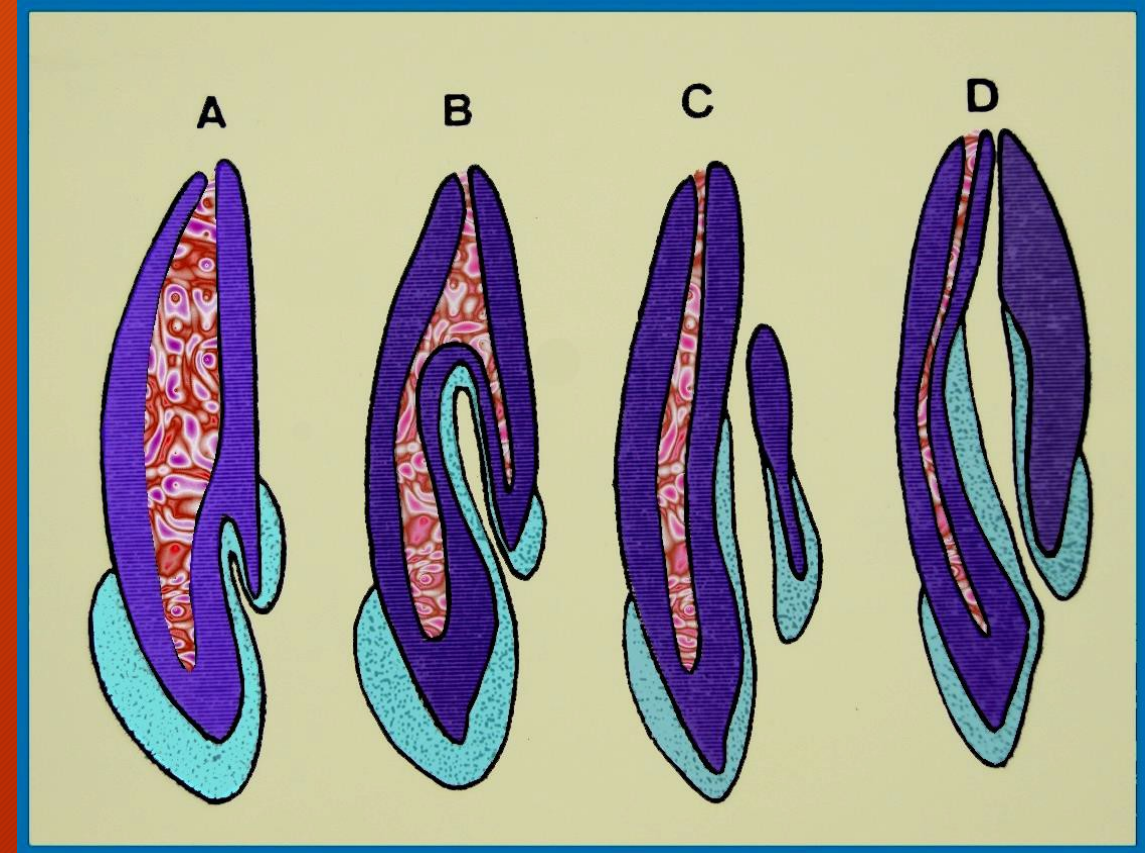
- İnvaginasyon kavitesi kron içindedir

## Tip 2

- İnvaginasyon kavitesi mine sement sınırını geçer, pulpaya çok yakındır

## Tip 3

- İnvaginasyon kavitesi köke doğru ilerlemiştir, ayrı bir açıklıkla periodonsiyuma ulaşır
- Bu ulaşım bazen apikalde olabilir



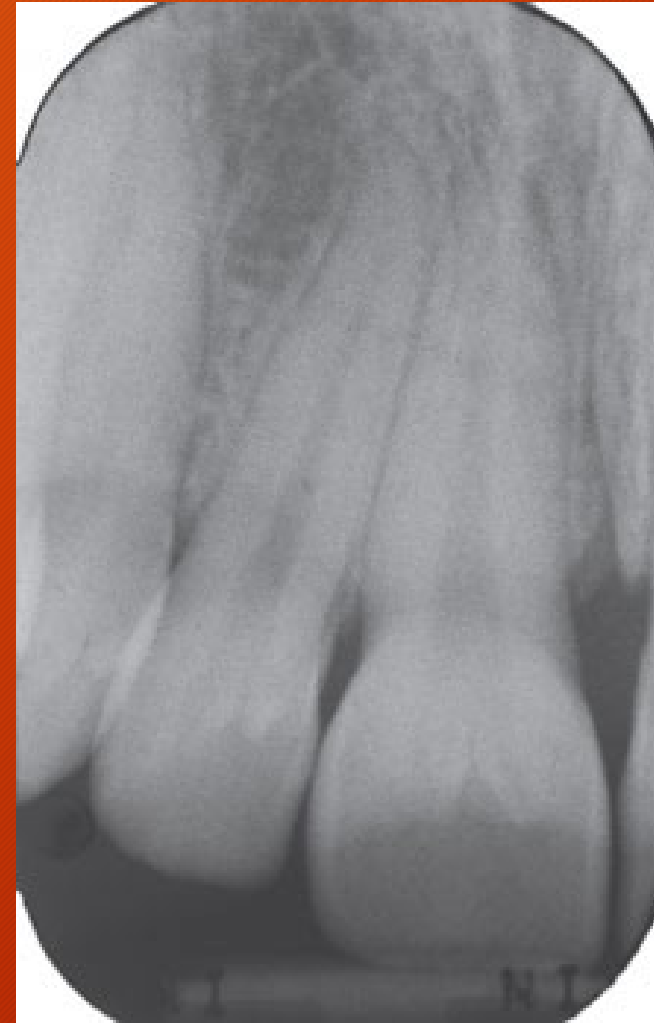


# Dens Invaginatus

## Tip 1

- Sadece kronunda olur
- En küçük tipteki invaginasyondur
- Mine-sement sınırının ötesine geçmez





# Tip 1

## Çift invaginasyon



# Dens Invaginatus

## Tip 2

- Mine-sement sınırının altına doğru uzanan fakat hiçbir zaman periodontal membran ve periapikal dokulara ulaşmayan kör bir torba şeklinde invaginasyondur
- Bazen pulpa ile ilişkili olabilmektedir



# Dens Invaginatus

## Tip 3

- Mine-sement sınırının altına doğru uzanan, periodontal membran ya da periapikal dokularda 2. bir foramene ulaşan invaginasyondur

# Dens Invaginatus

## Tip 3 A

- İnvaginasyon kök boyunca ilerler ve periodontal ligament boşluğuna lateralde ulaşır
- Pulpa ile ilişkili değildir



# Dens Invaginatus

## Tip 3 B

- İnvaginasyon kök boyunca ilerler ve periodontal ligament boşluğuna apikal foramende ulaşır
- Pulpa ile ilişkili değildir



# Dens Invaginatus



Gıda artıklarının retansiyonuna baęlı olarak ürükler ve pulpa enfeksiyonları görölmektedir



Invaginasyon içindeki muhtemel ürük varlığından emin olmak için mutlaka radyograf alınmalı, vitalite testi yapılmalı ve semptomlar deęerlendirilmelidir



Derecesine göre tedavi planı ıkarılmalıdır



# Dens Invaginatus



Bu diřler ürükten ok kolay etkilenererek pulpitis, nekroz ve periapikal lezyonların oluřumuna neden olmaktadır



Bu diřlerin karmařık yapılarından dolayı endodontik tedavileri sırasında pek ok sorunla karřılařılır



Bazı durumlarda ürük olmadığı halde derin ukurcuk vasıtasıyla pulpa enfekte olmakta ve zamanla nekroz oluřmaktadır

# Dens Invaginatus

Proflaktik tedavi

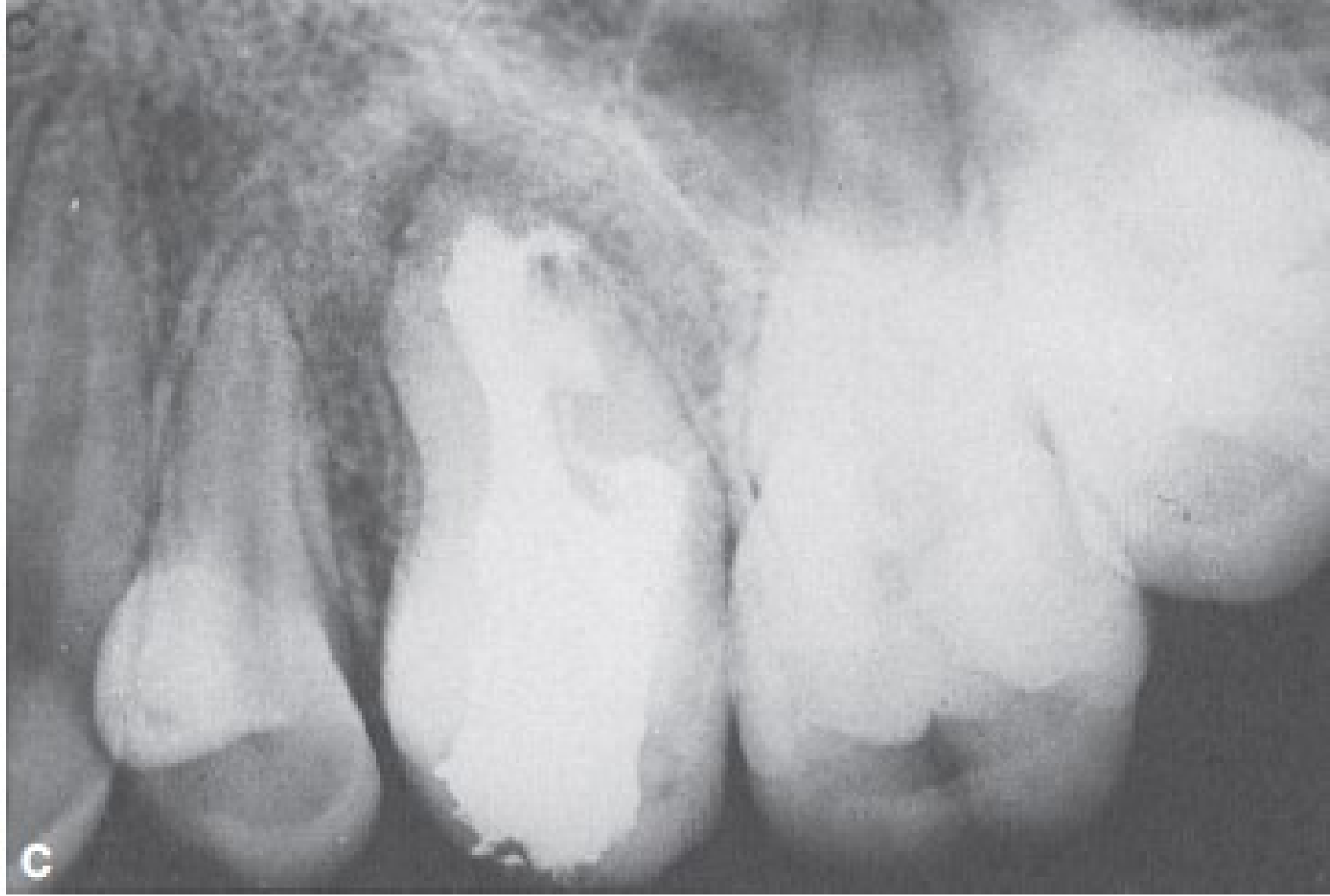
Konservatif tedavi

Endodontik tedavi

Endodontik tedavi+periapikal cerrahi









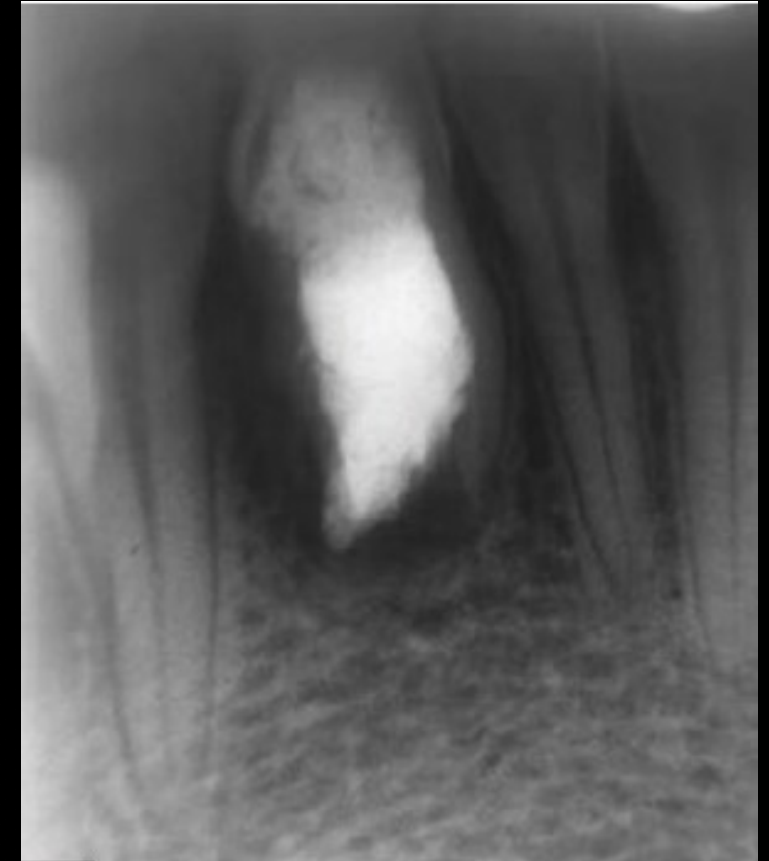
a



b

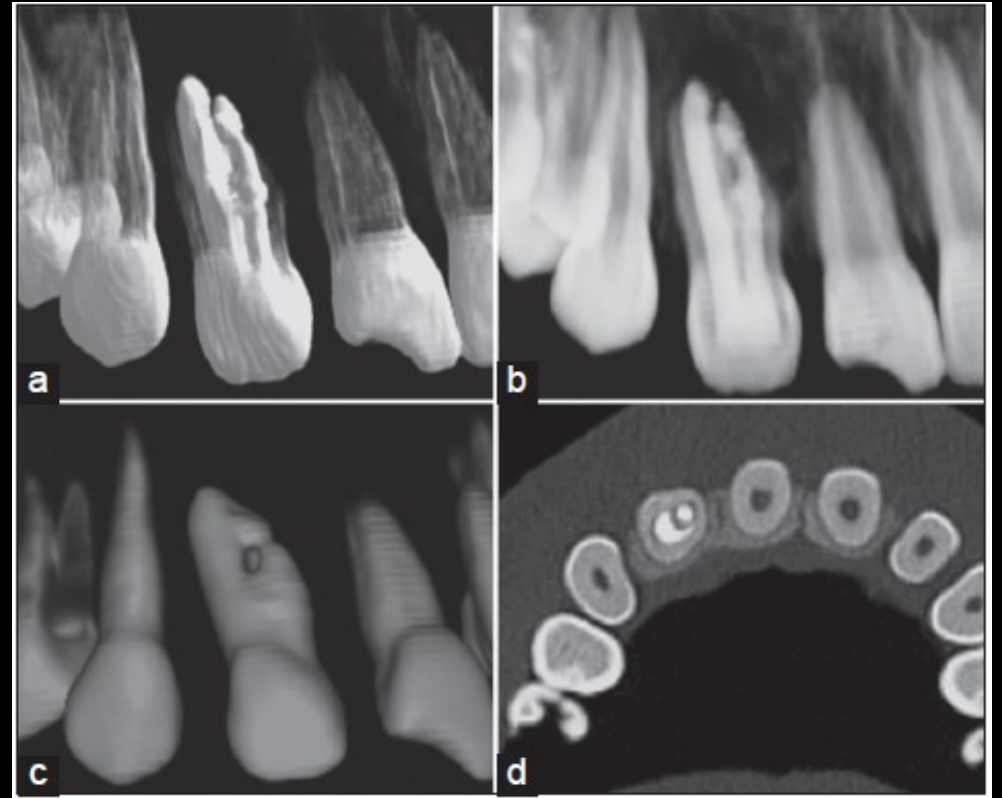


c



**How to cite this article:** Ali A, Saraf P, Patil J. Endodontic management of type III B dens invaginatus: An unusual case report. Saudi Endod J 2018;8:144-8.

**How to cite this article:** Muppa R, Nallanchakrava HS, Mettu S, Dandu RV, Tadikonda DC. Type III B dens invaginatus: Diagnostic and clinical considerations using 128-slice computed tomography. *J Indian Soc Pedod Prev Dent* 2014;32:342-5.



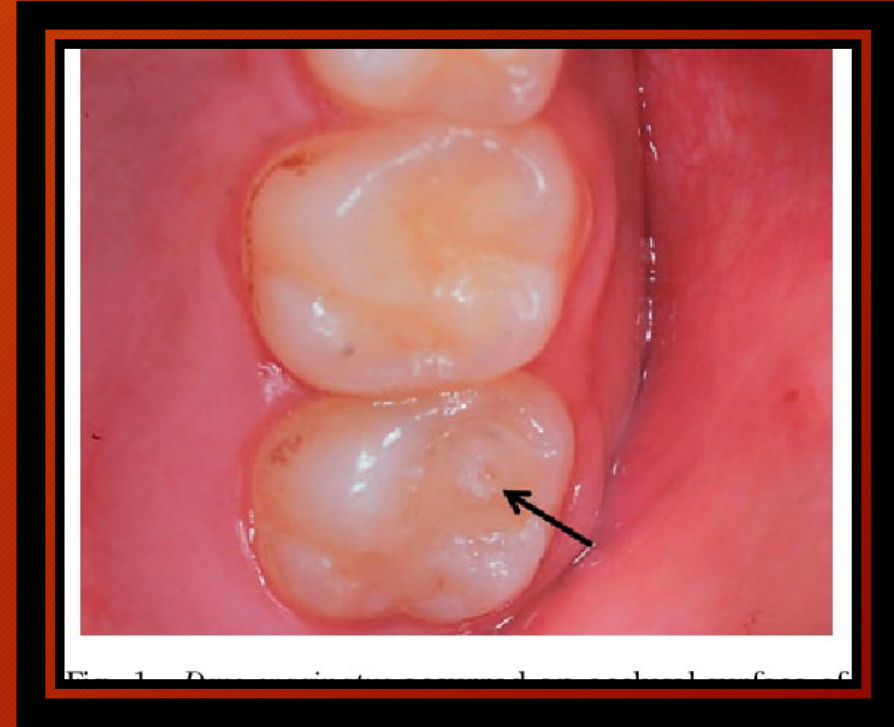
# Dens Evaginatus



Mine organının dışı doğru büyümesidir

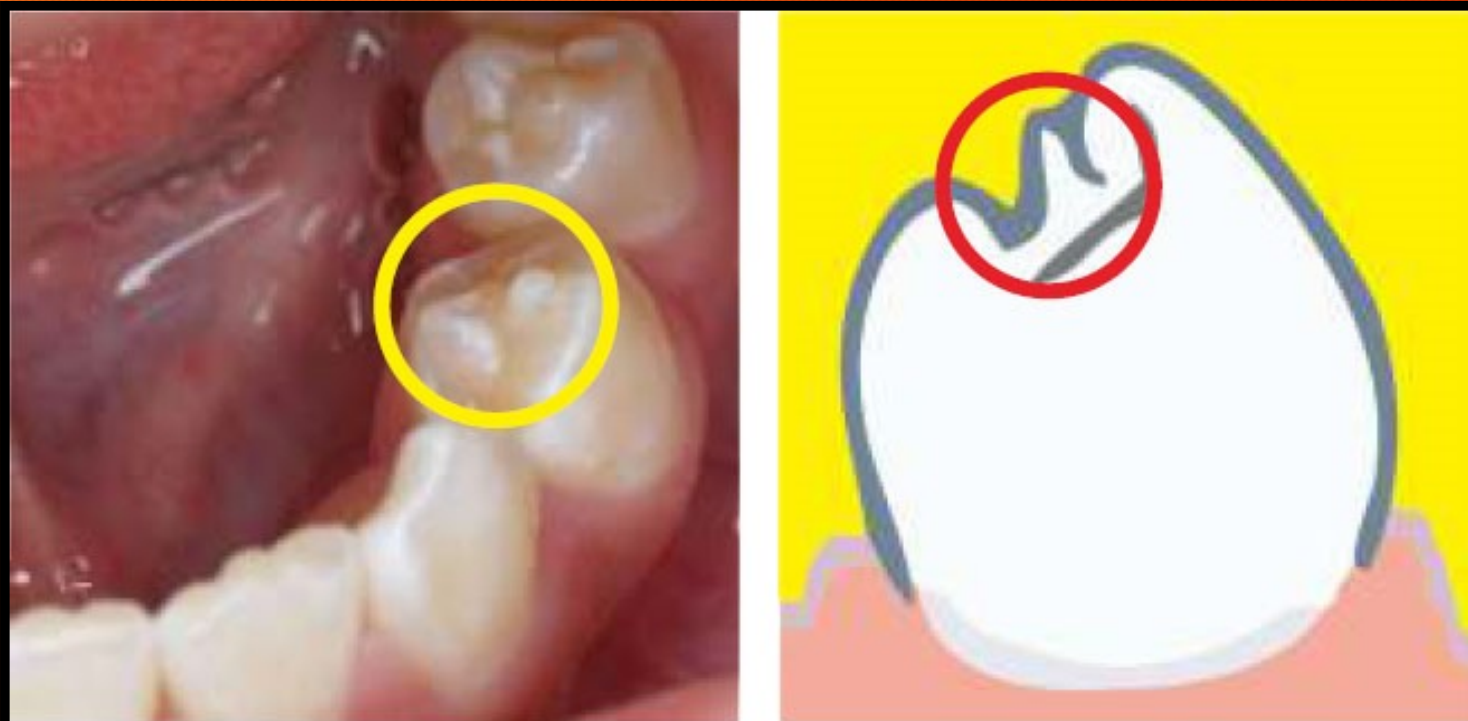


Genellikle posterior dişlerin santral oluğu ve sırtında ve santral-lateral kesicilerin singulum bölgesinde görülen ekstra tüberkül yapısıdır



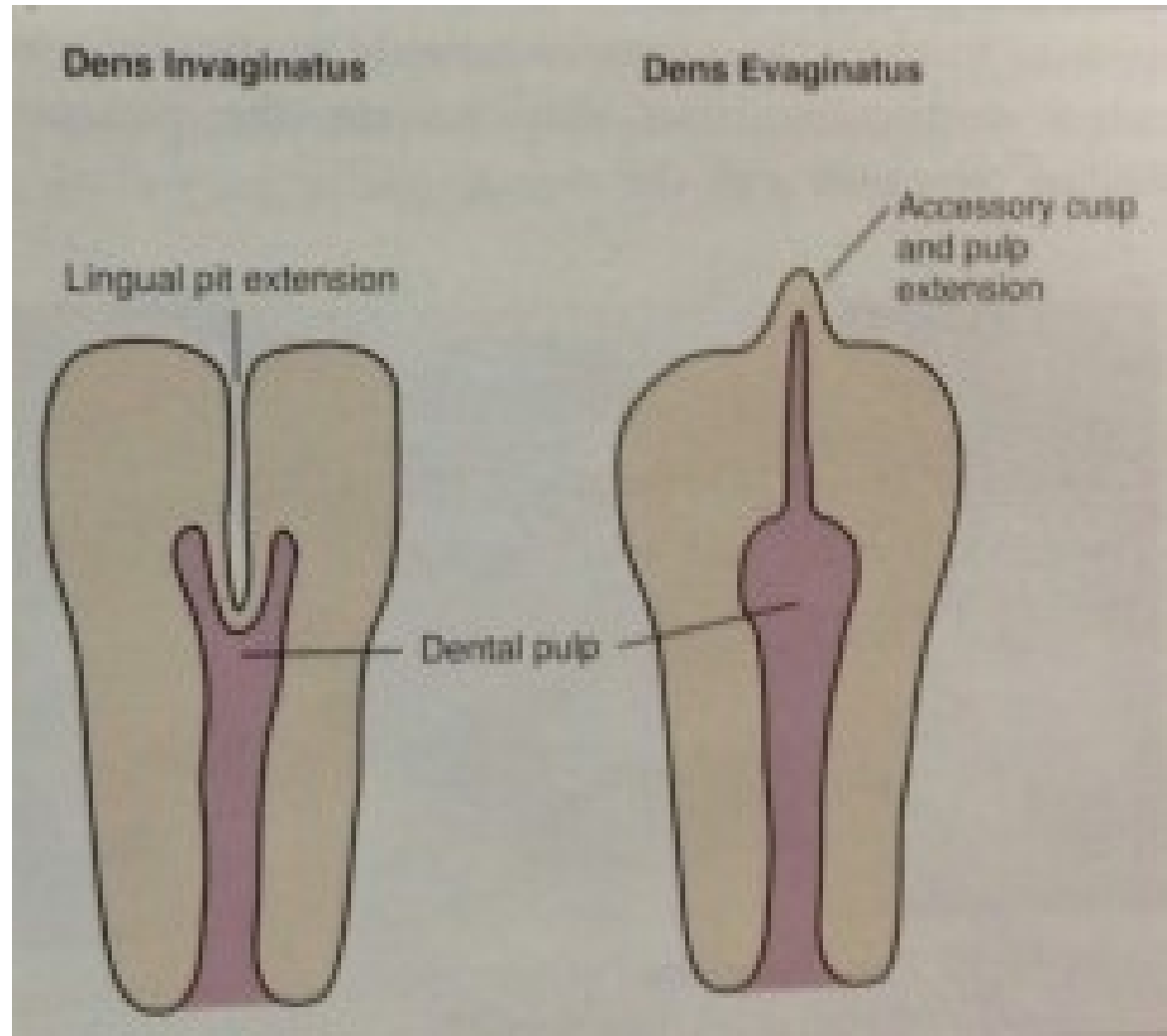


# Dens Evaginatus



*Protruding tubercle in posterior teeth*

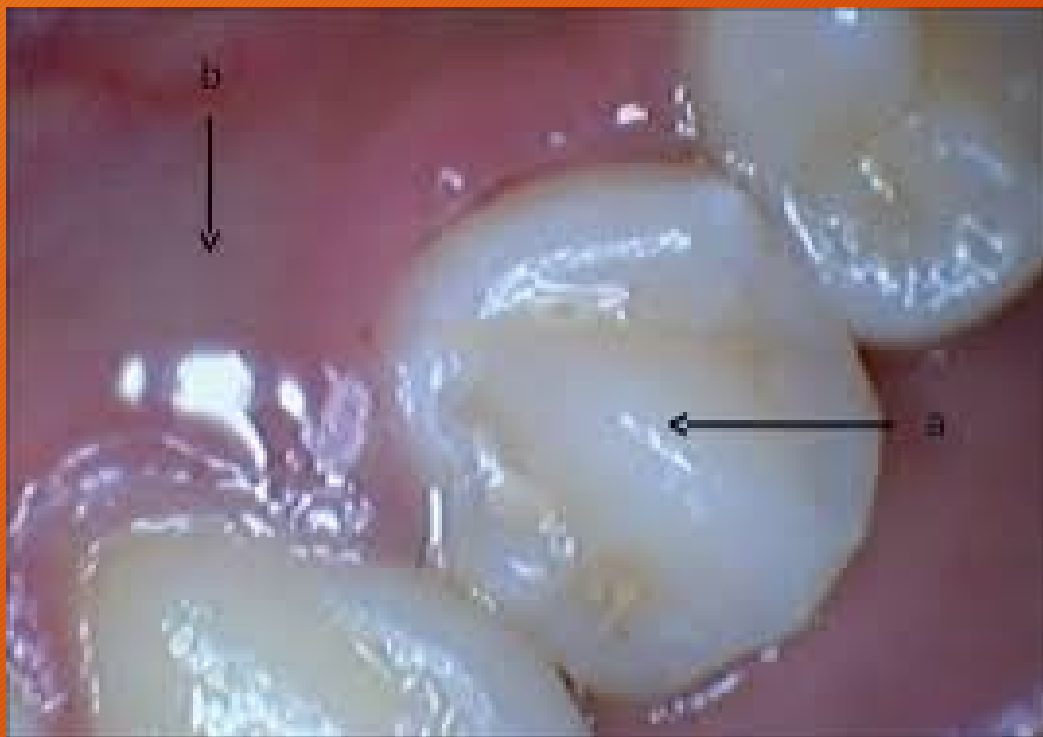
# Dens Evaginatus vs Dens Invaginatus



# Dens Evaginatus



# Dens Evaginatus



# Talon Tüberkülü



Tüberkül anterior dişlerin lingual yüzeyindeyse kullanılan terimdir



Talon tüberkülü anterior dişlerin labial yüzeyinde de görülebilir



# Talon Tüberkülü



**Figure 1:** Intra-oral photograph showing talon cusp projecting from the facial surface of the crown of mandibular left central incisor extending from the cervical aspect of the crown to the incisal edge



# Talon Tüberkülü



# Endodontik Yaklaşım

Tüberkül oklüzal yüzeyde olduğu için travmatik oklüzyon görülebilir

Tüberkülün anormal aşınması veya kırılması

Pulpal enflamasyon ve nekroz



# Endodontik Yaklaşım



# Endodontik Yaklaşım



Management of an Innocuous Looking Dens Evaginatus.

Pishipati Vinayak Kalyan Chakravarthy<sup>1\*</sup>, and Ajay Telang<sup>2</sup>

RRJDS | Volume 1 | Issue 3 | October-December, 2013

# Endodontik Yaklaşım



Pulpa nekrozu kök gelişimini tamamlamamış dişte gelişirse tedavi daha kompleks olabilir



Bazı araştırmacılar çekim önermiştir

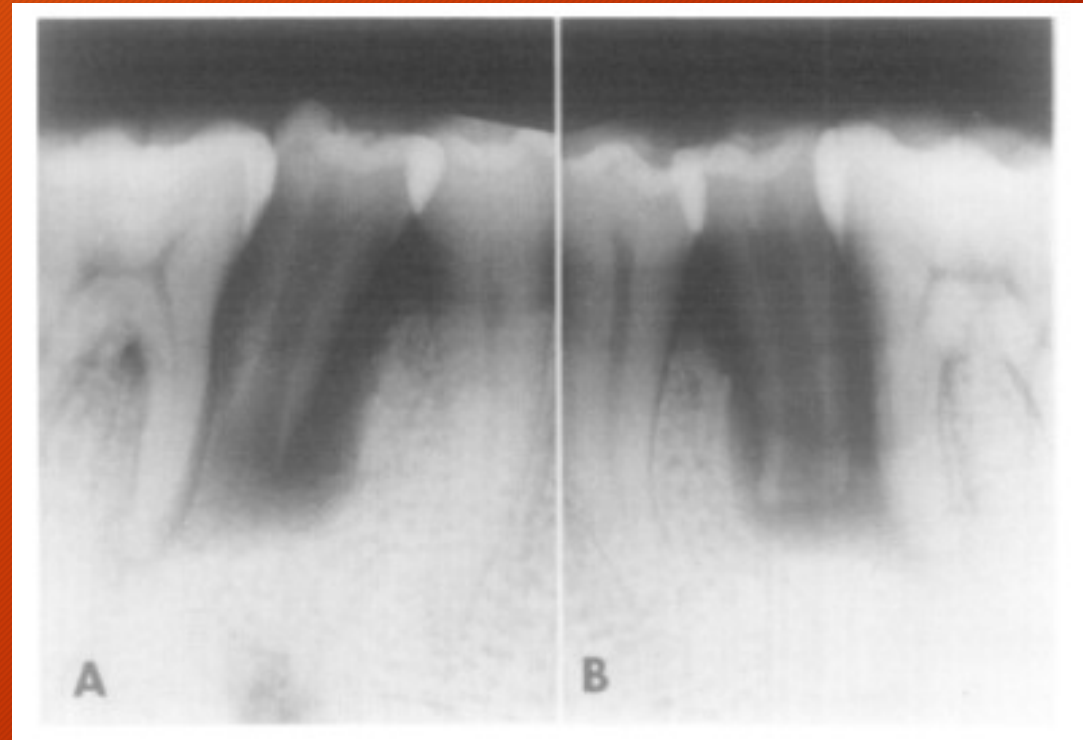


Ancak kök ucu bariyeri sağlandıktan sonra kök kanal tedavisi yapılabilir

# Dens evaginatus in the etiology of bilateral periapical pathologic involvement in caries-free premolars

## Abbreviated case report

*E. Steve Senia, D.D.S., M.S.,\* and Joseph A. Regezi, D.D.S., M.S.,\*\*  
Travis Air Force Base, Calif., and Ann Arbor, Mich.*





# Endodontik Yaklaşım

Kök gelişiminin devam etmesi için rejeneratif endodontik teknikler de uygulanabilir

# Endodontik Yaklaşım



# Dens Evaginatus: Literature Review, Pathophysiology, and Comprehensive Treatment Regimen

*Marc E. Levitan, DDS, and Van T. Himel, DDS*



# Concrescence (Yapışma)



İki veya daha fazla dişin yalnız sementlerinin birbirine yapışması sonucunda oluşur



Travma veya iltihap sonucu dişler arasındaki septum ortadan kalkar, dişler yalnız sementleriyle birbirine yapışır



Dişlerin pulpa, dentin ve mineleri ayrıdır



Radyografda birbirine bitişik 2 diş görülür









## Endodontic Treatment of Mandibular Molars with Concrecence

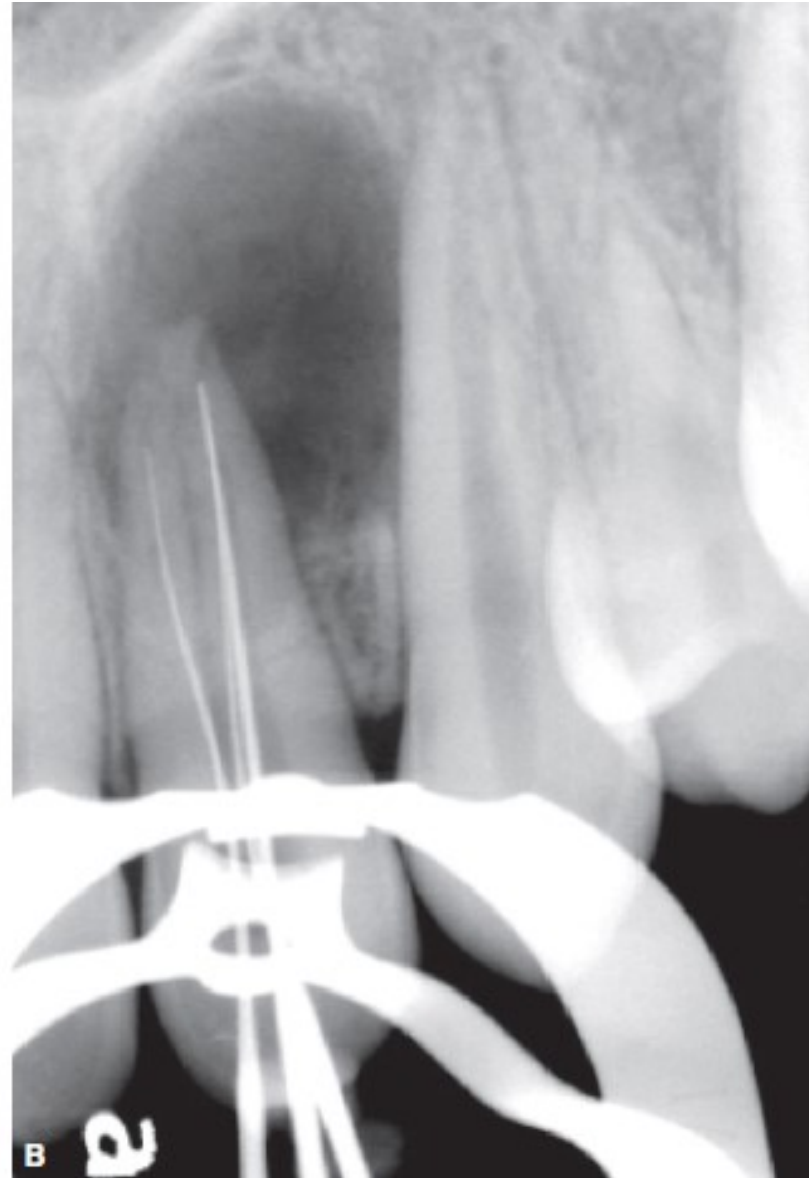
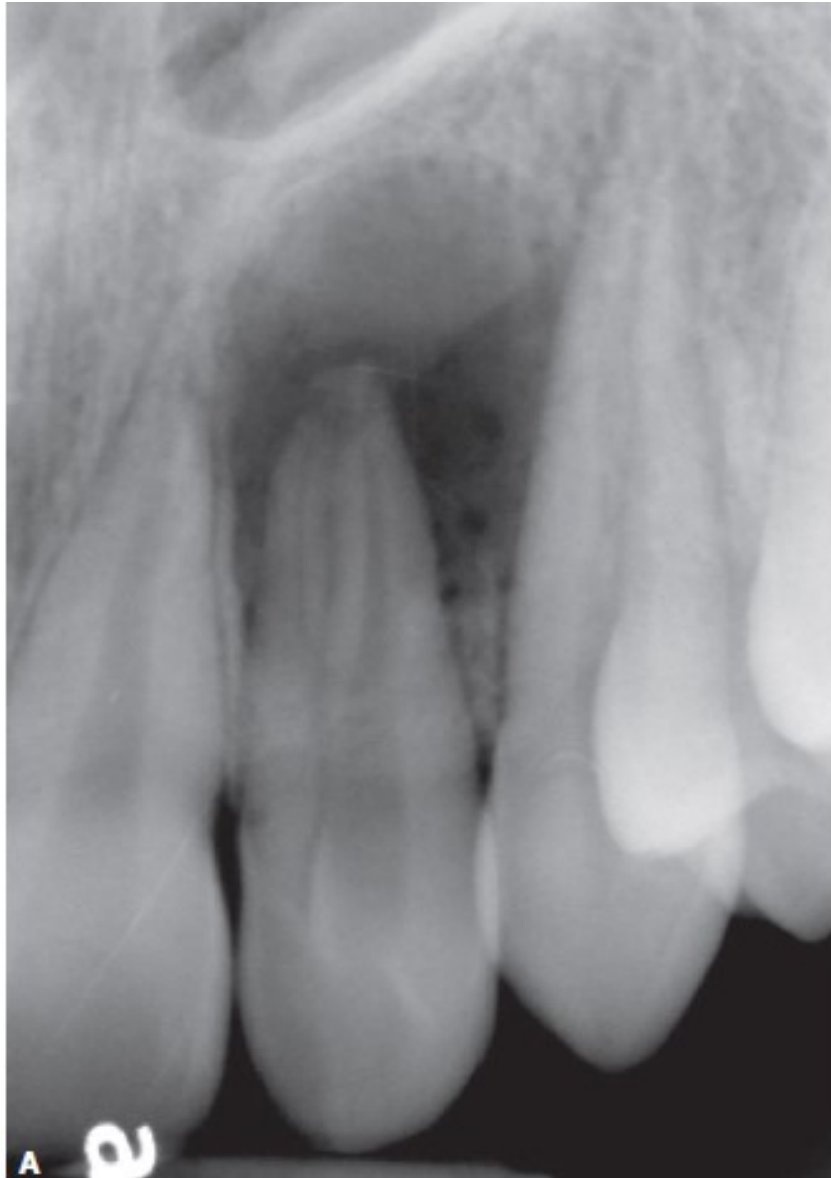
Lawrence Law, DMD, Gerald Fishelberg, DDS, Joseph E. Skribner, DDS, and Louis M. Lin, BDS, DMD, PhD

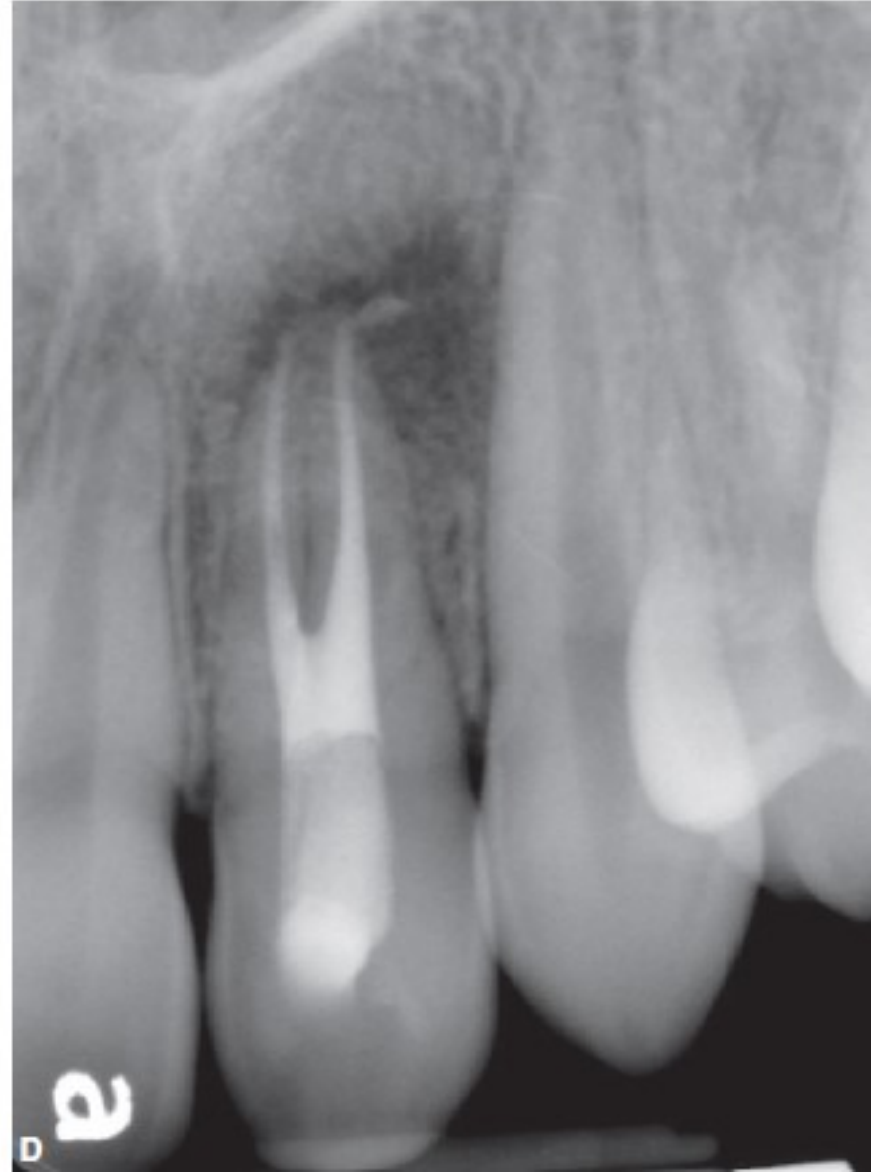




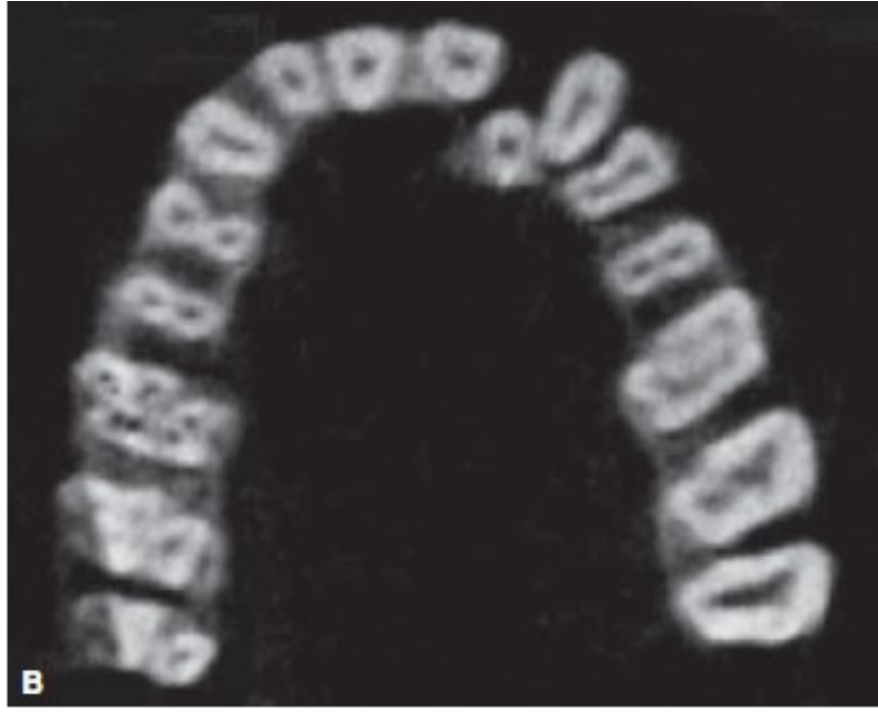
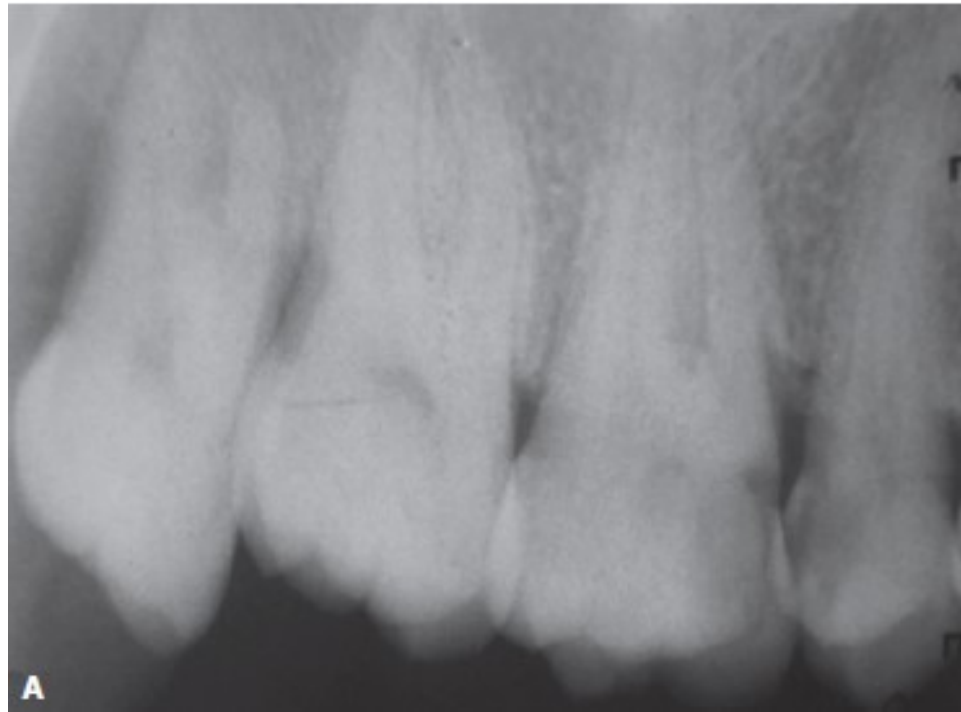
# Supernumere Kök ve Kanallar

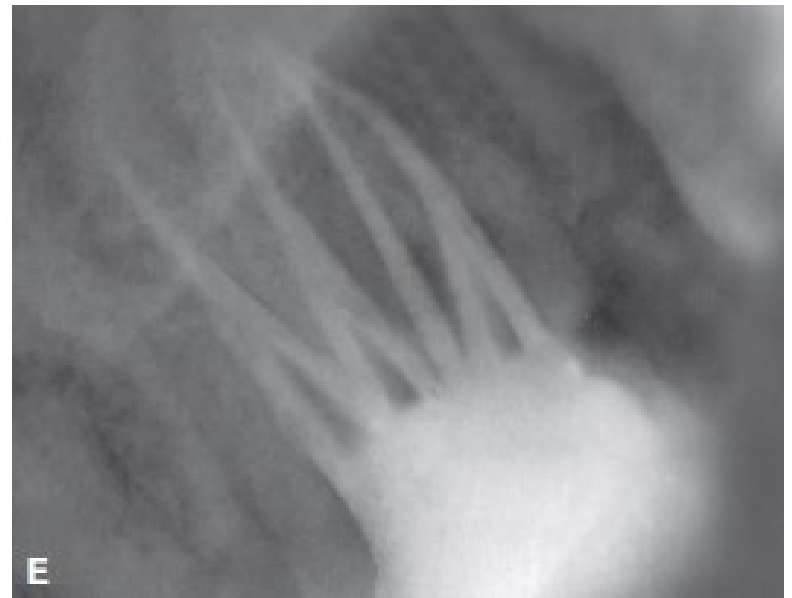
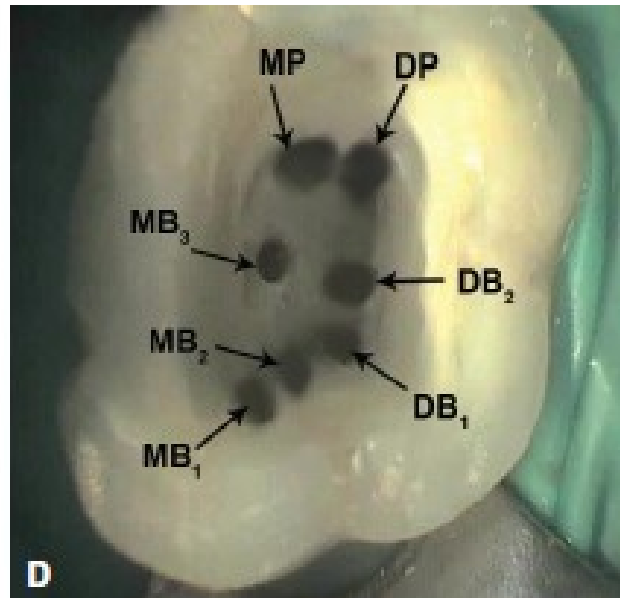
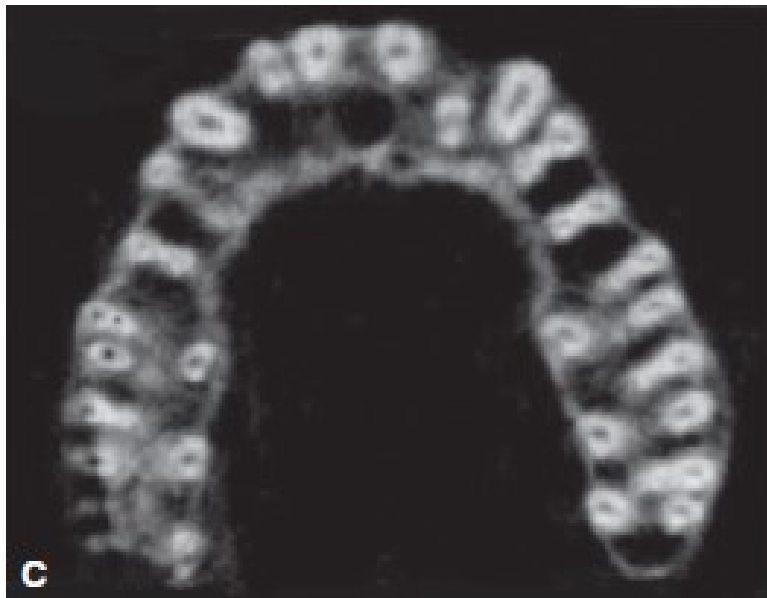


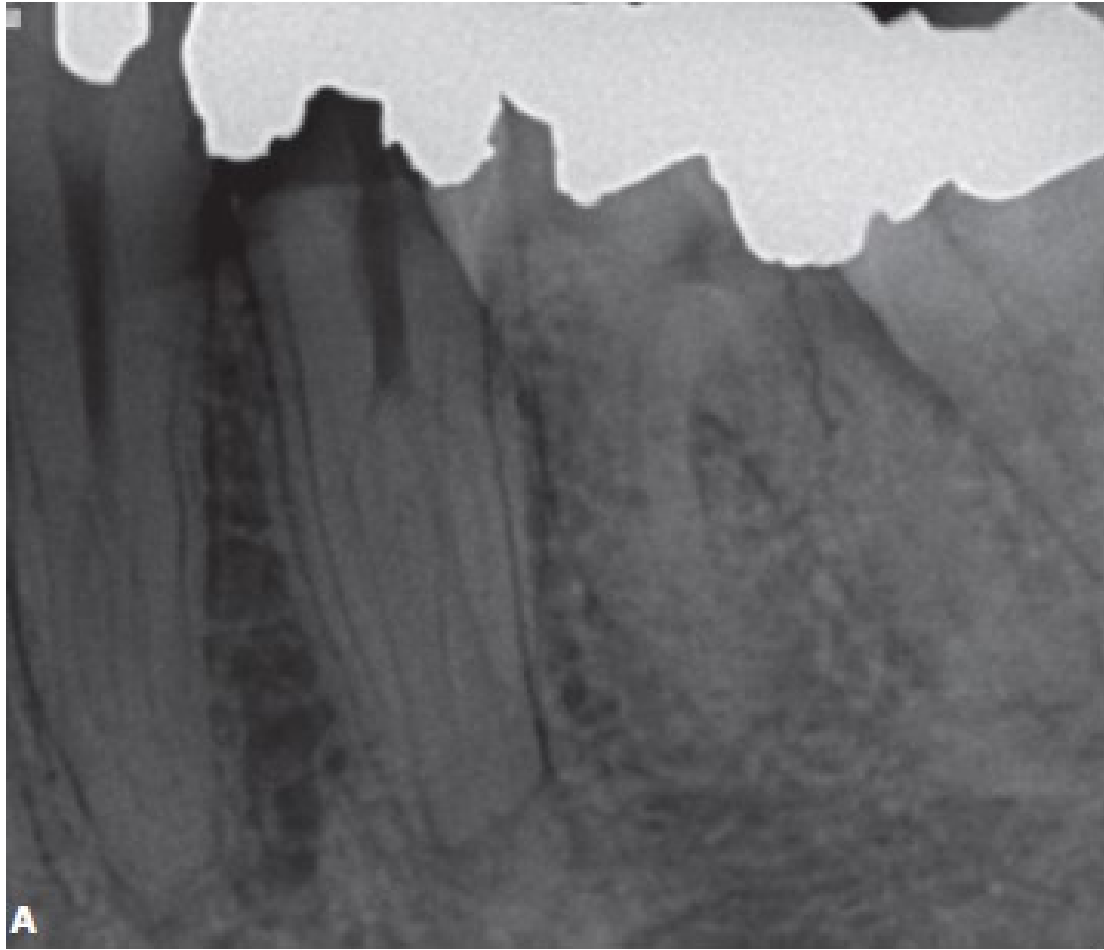






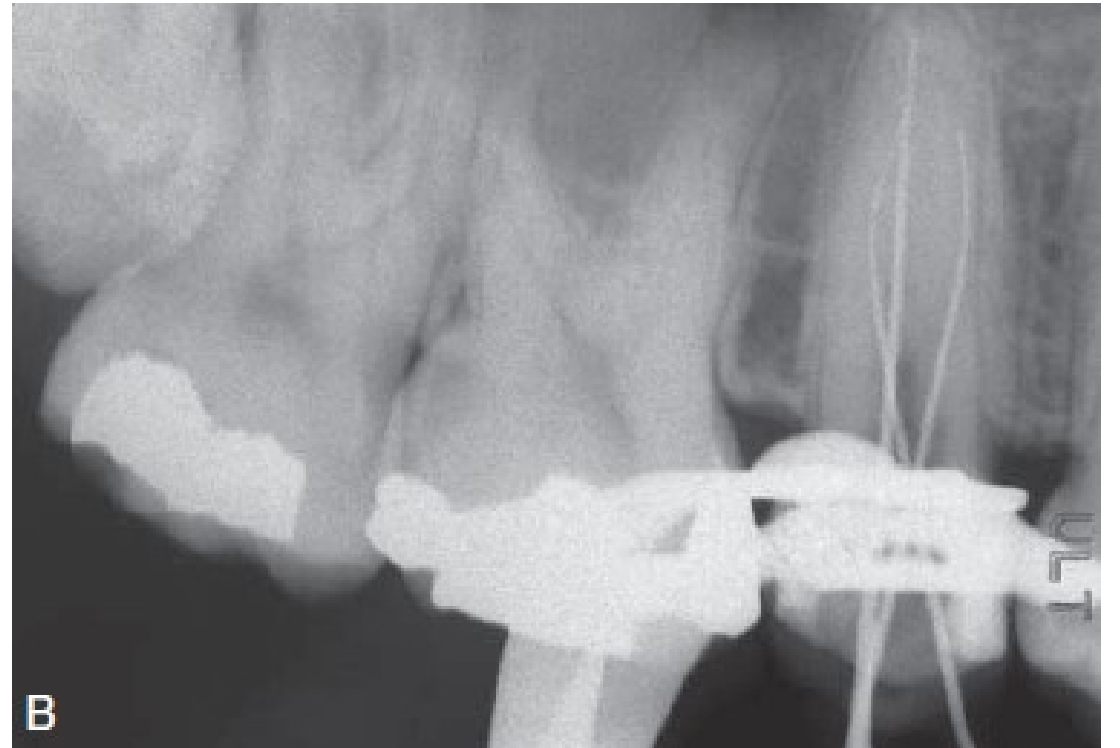


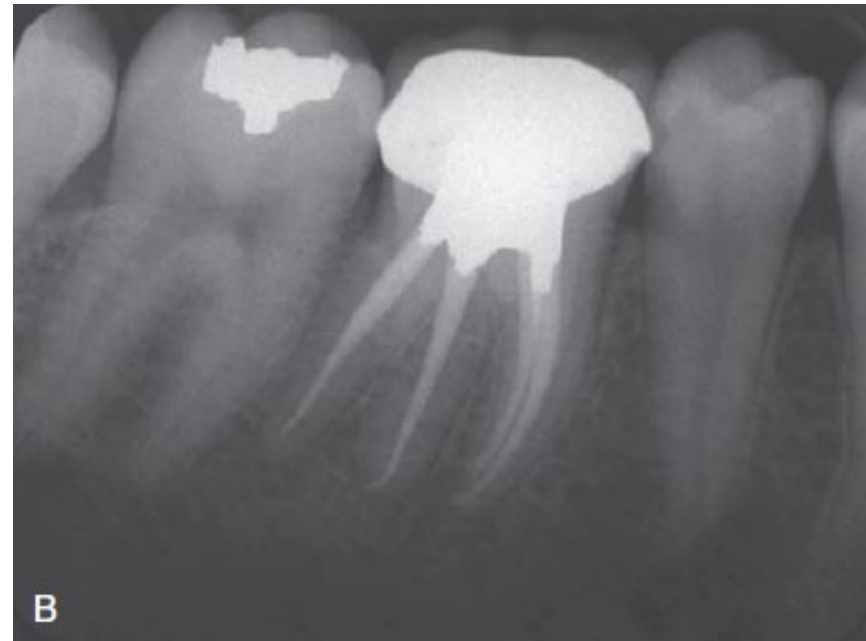












# C-Şekilli Kanallar



Kanalların yarık şeklinde birleşimidir ve kesitte C şeklinde görüntü ortaya çıkar

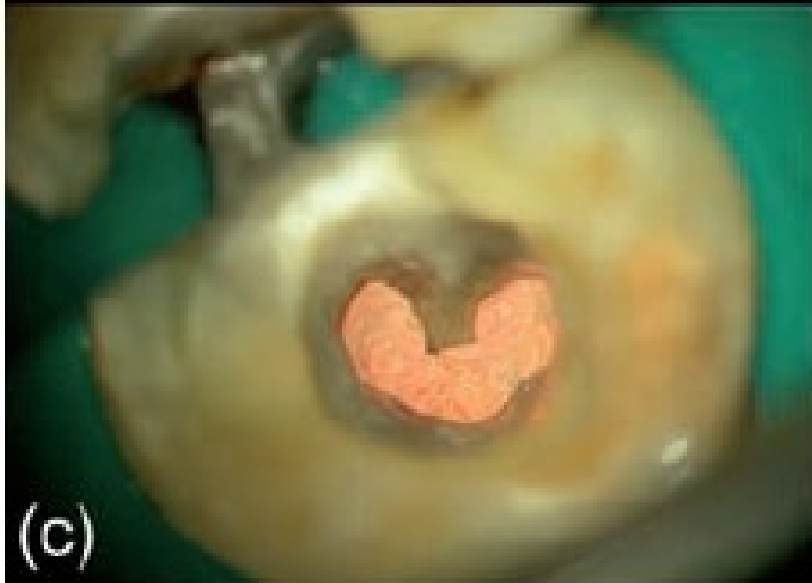


Görülme sıklığı % 2.7- %44.5

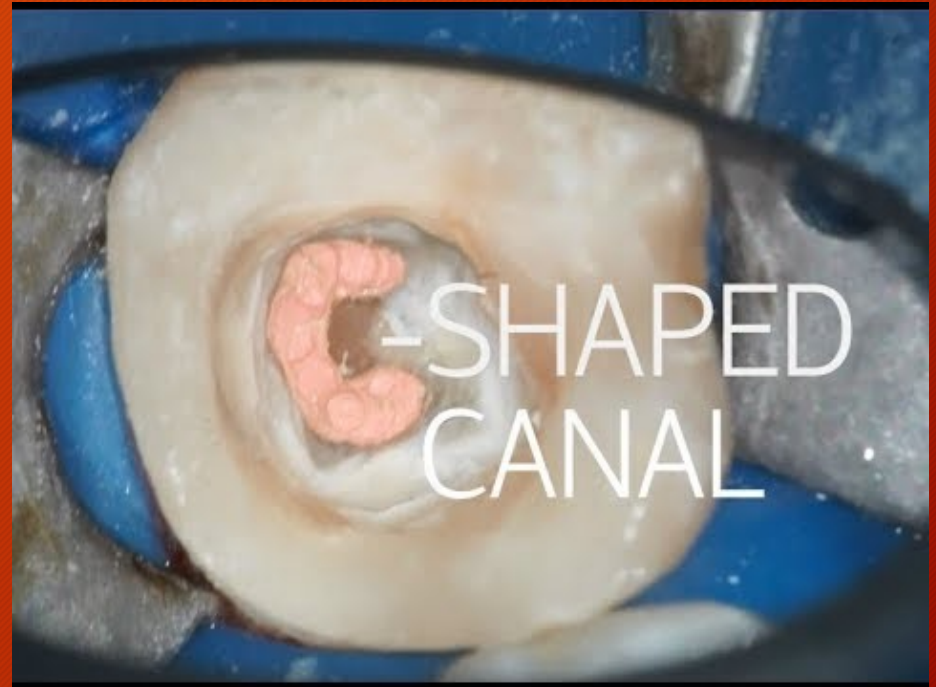


Genellikle mandibular 2. molar dişlerde görülür





# C-Şekilli Kanallar



# Melton Sınıflandırması

## Category 1

- Kesintisiz C şekilli görüntü

## Category 2

- Noktalı virgül şekilli görüntü

## Category 3

- İki veya daha fazla ayrık görünümlü kanallar

## Anatomical and Histological Features of C-Shaped Canals in Mandibular Second Molars

Darlene C. Melton, DDS, Keith V. Krell, DDS, MS, MA, and Michel W. Fuller, DDS, MS

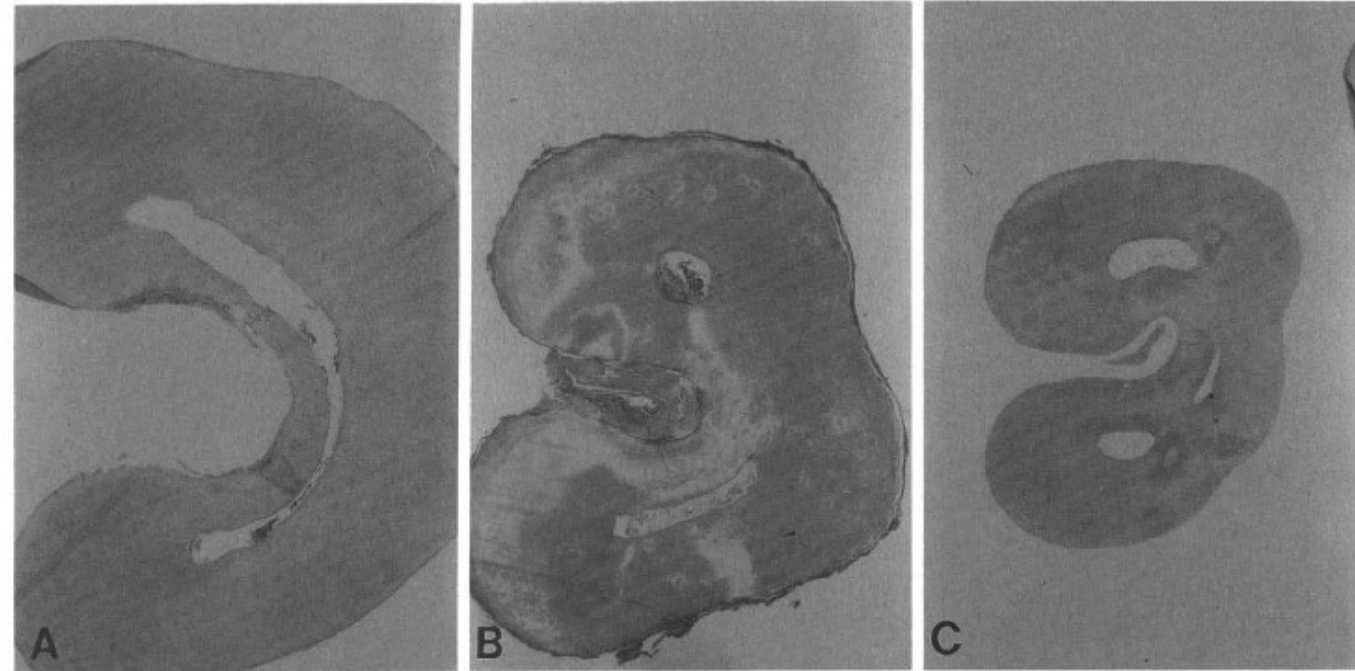
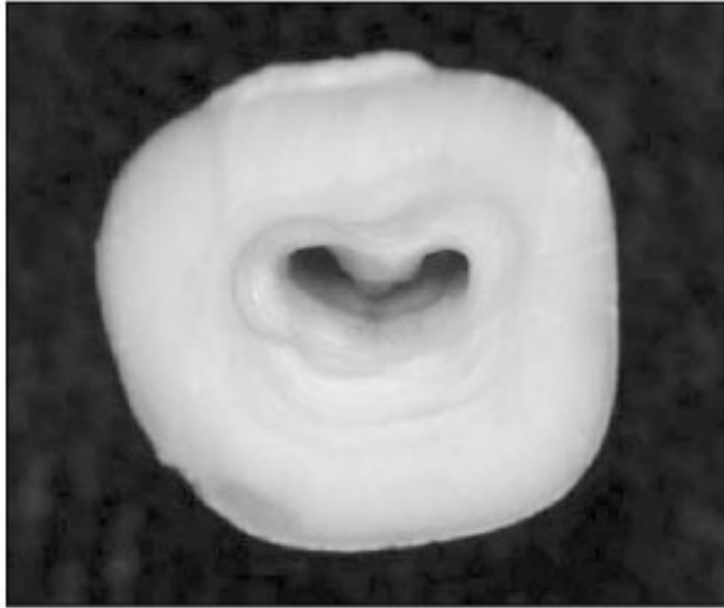
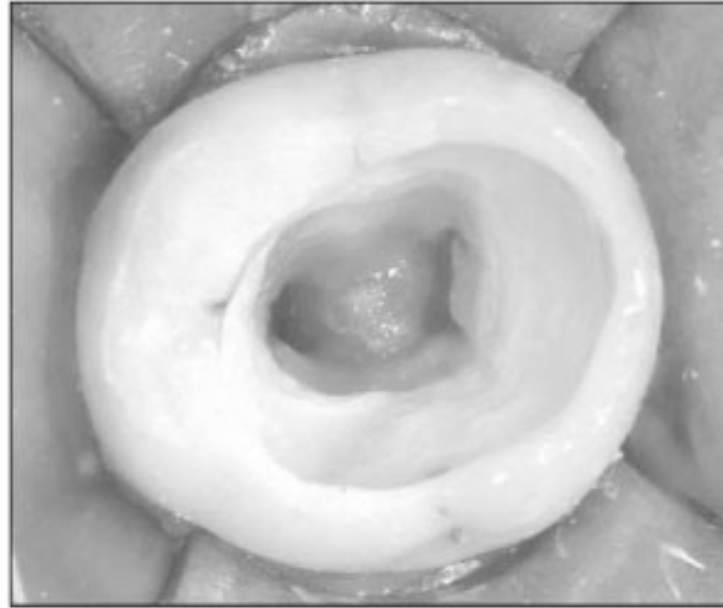


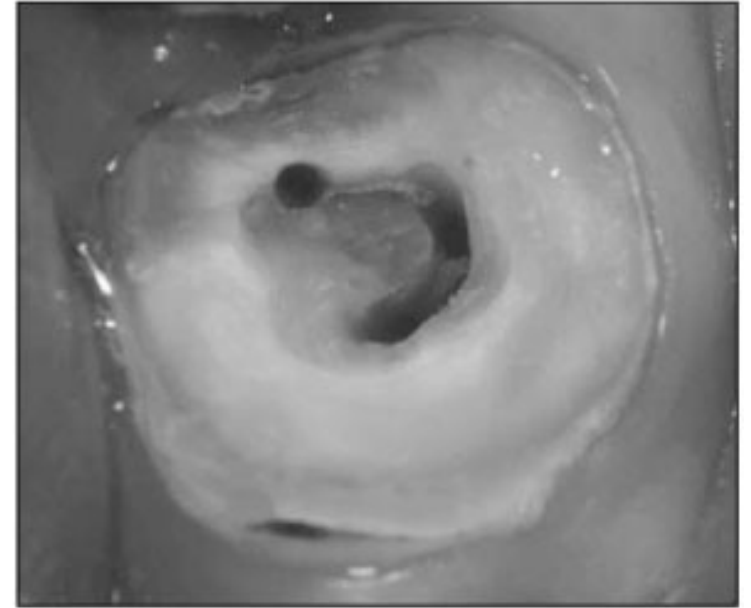
FIG 2. Photomicrographs of cross-sections at the mid or apical root level illustrating examples of categories used to classify canal type when viewing histological specimens. *A*, Category I: continuous C-shaped canal. *B*, Category II: "semicolon"-shaped canal. *C*, Category III: discrete, separate canals (hematoxylin and eosin; original magnification  $\times 25$ ).



Type I: Continuous



Type II: Semicolon



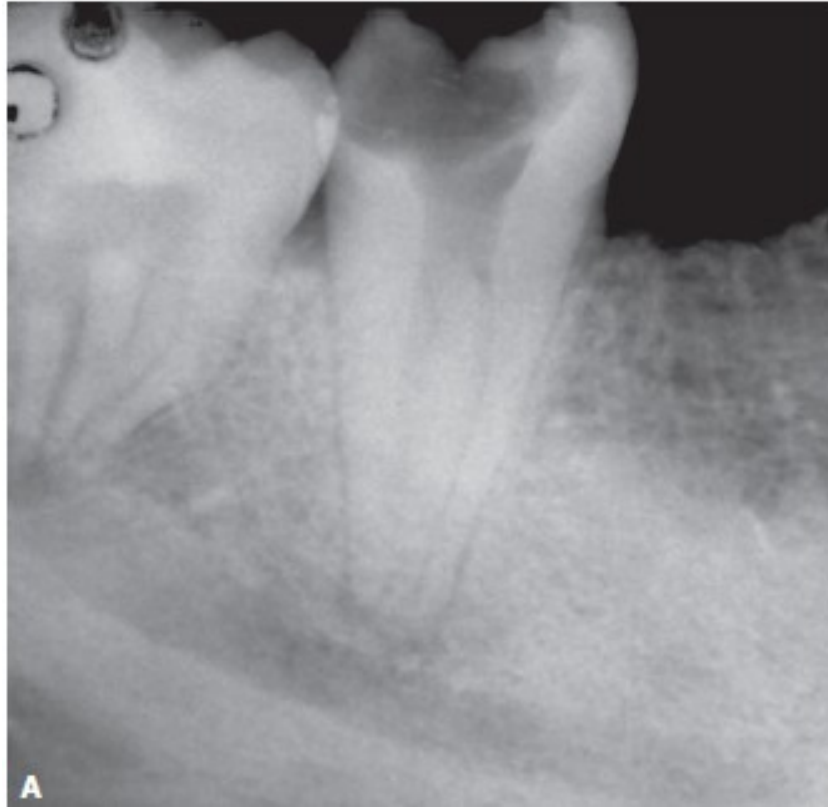
Type III: Separate

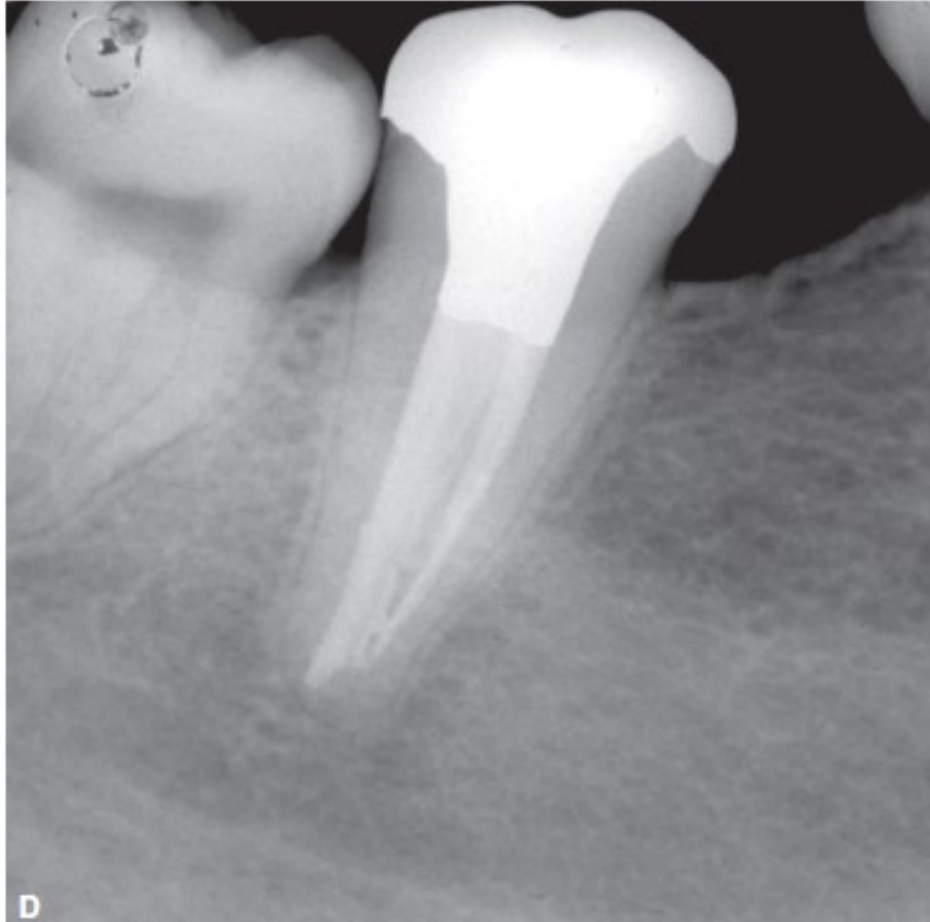
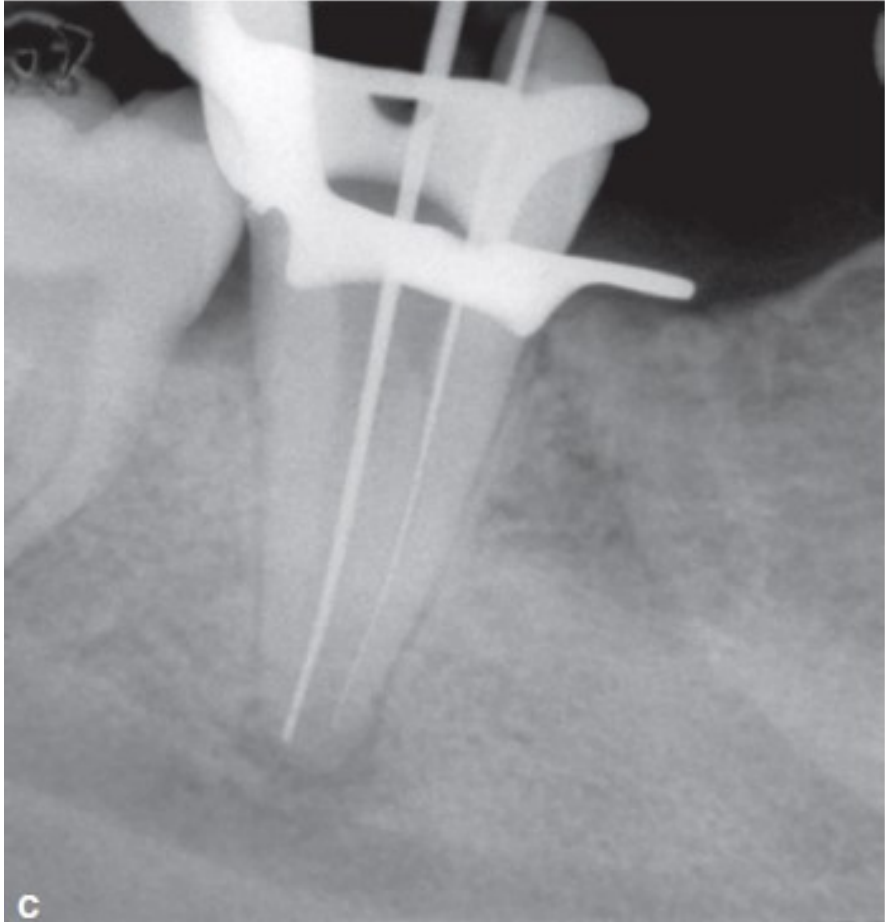






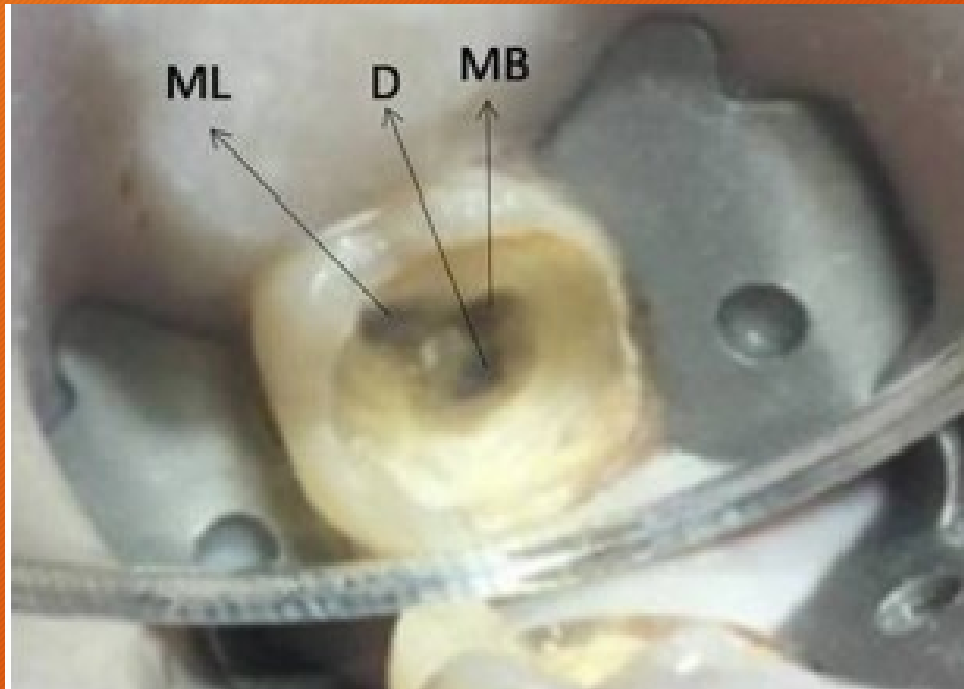






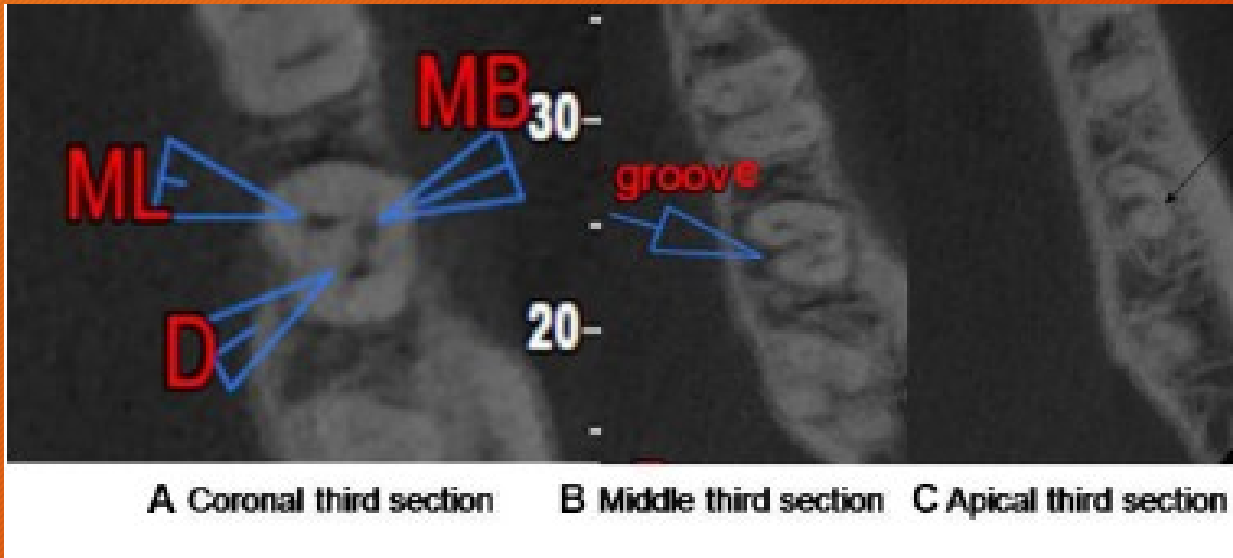
# Management of C-shaped root canal configuration in mandibular second molar

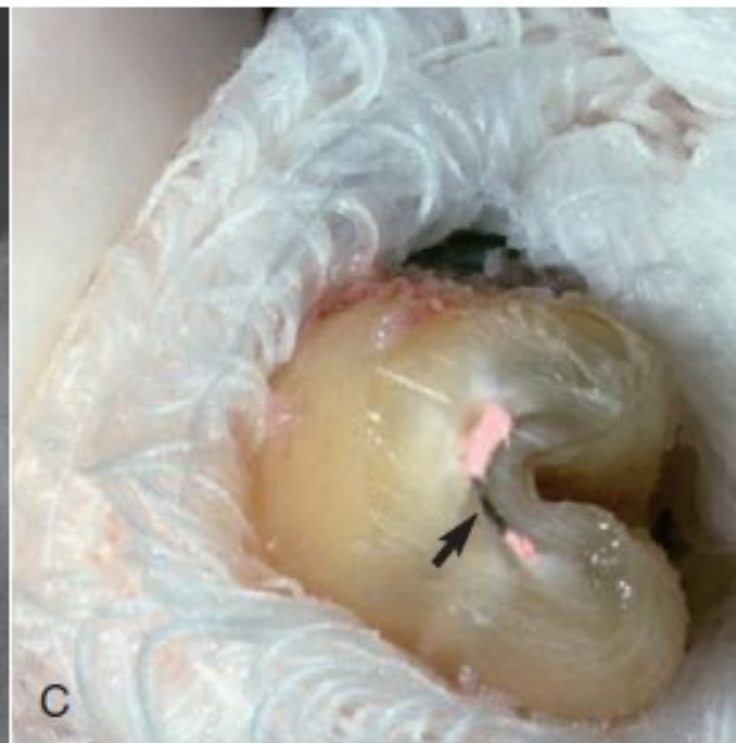
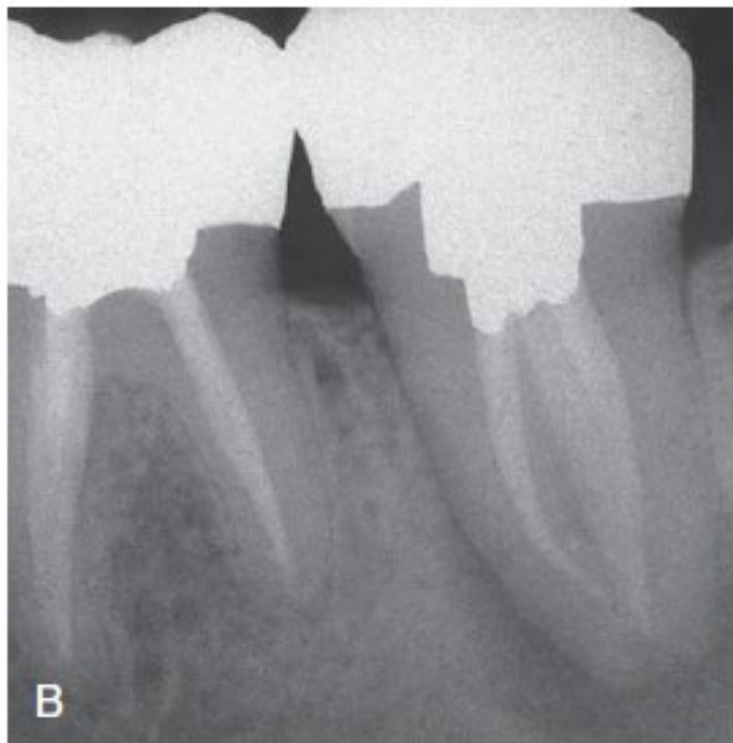
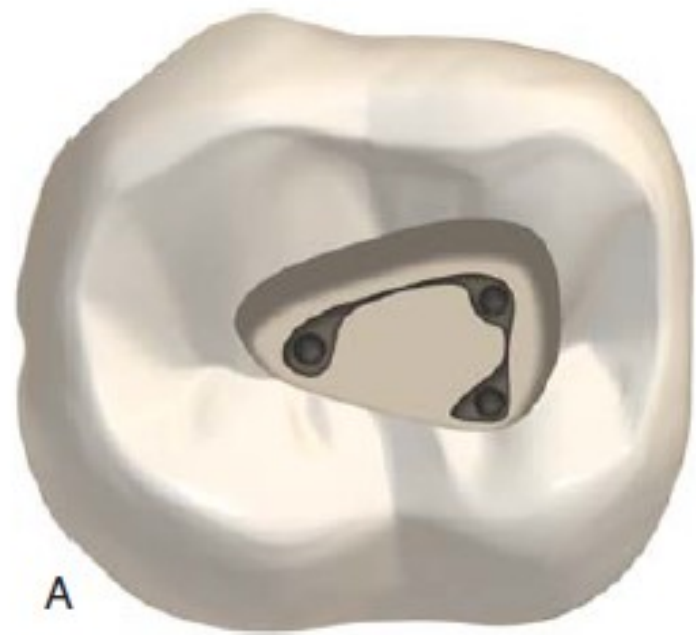
Abishek Lakinepally,<sup>1</sup> Sonali Sharma,<sup>2</sup> Dileep Kishore Samarthy,<sup>3</sup> Nishant Sinha<sup>4</sup>



# Management of C-shaped root canal configuration in mandibular second molar

Abishek Lakinepally,<sup>1</sup> Sonali Sharma,<sup>2</sup> Dileep Kishore Samarthy,<sup>3</sup> Nishant Sinha<sup>4</sup>





# Dilaserasyon



Dişin uzun ekseninden ani, sert bir sapma olarak tanımlanır



Hem süt hem de daimi dişlerde gözlenebilir



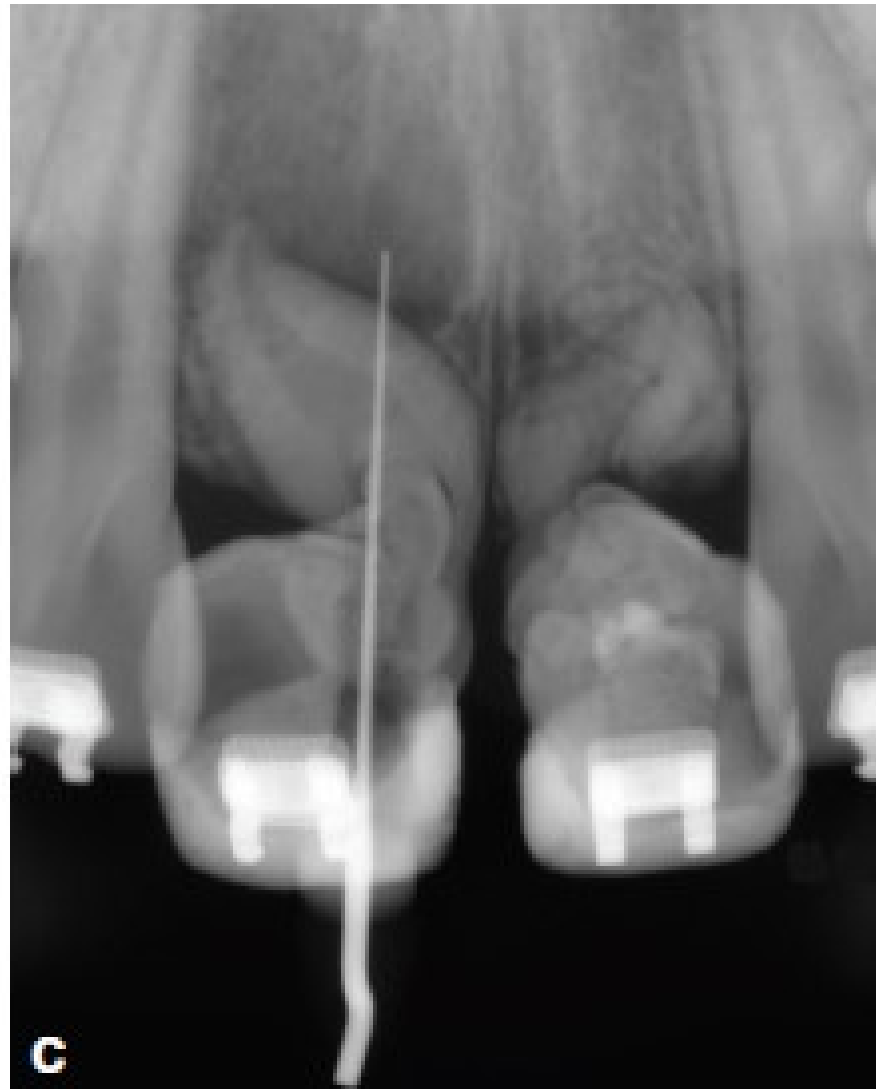
Görülme sıklığı % 1.8 - % 98



# Dilaserasyon

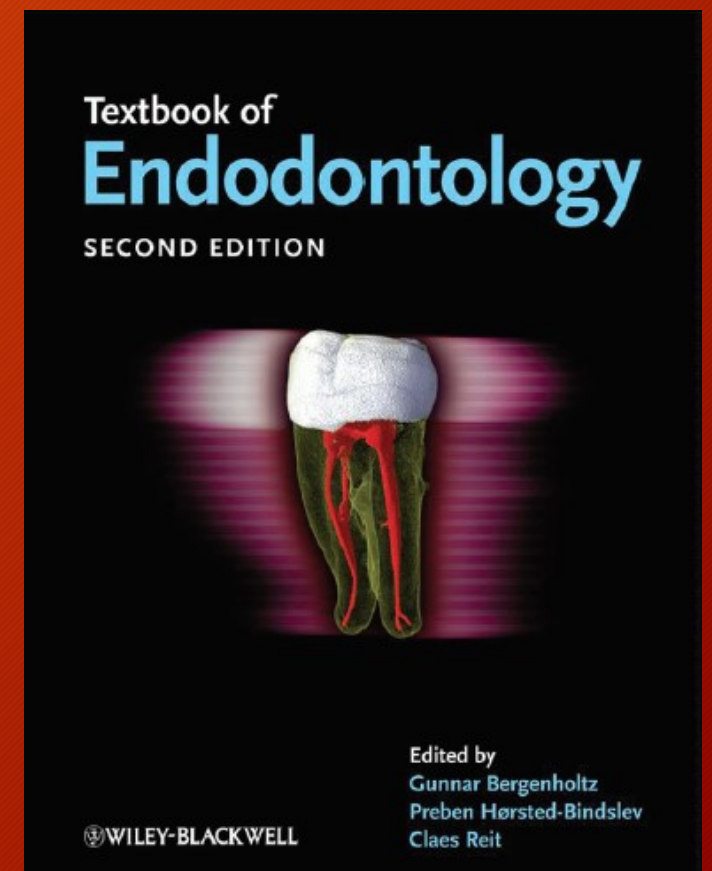
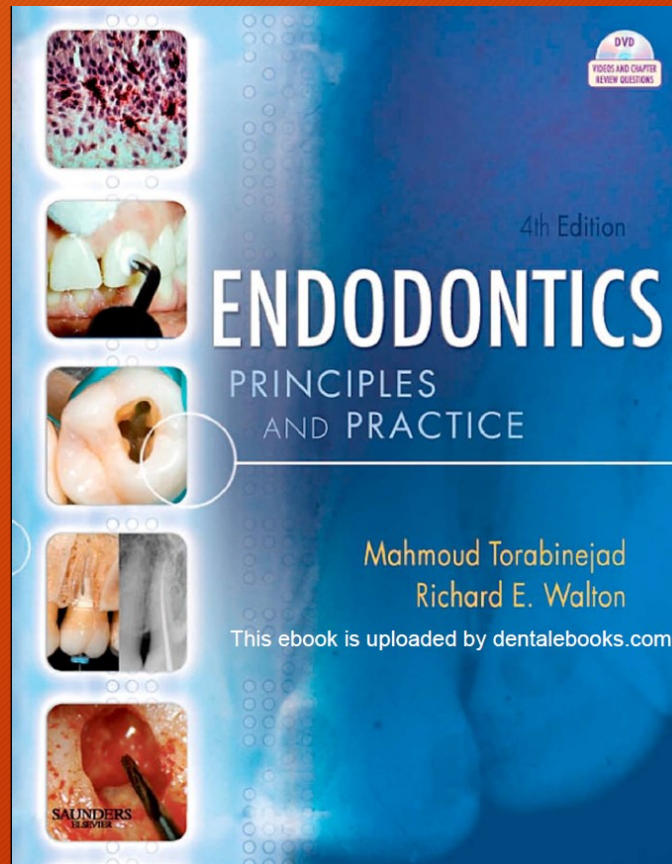
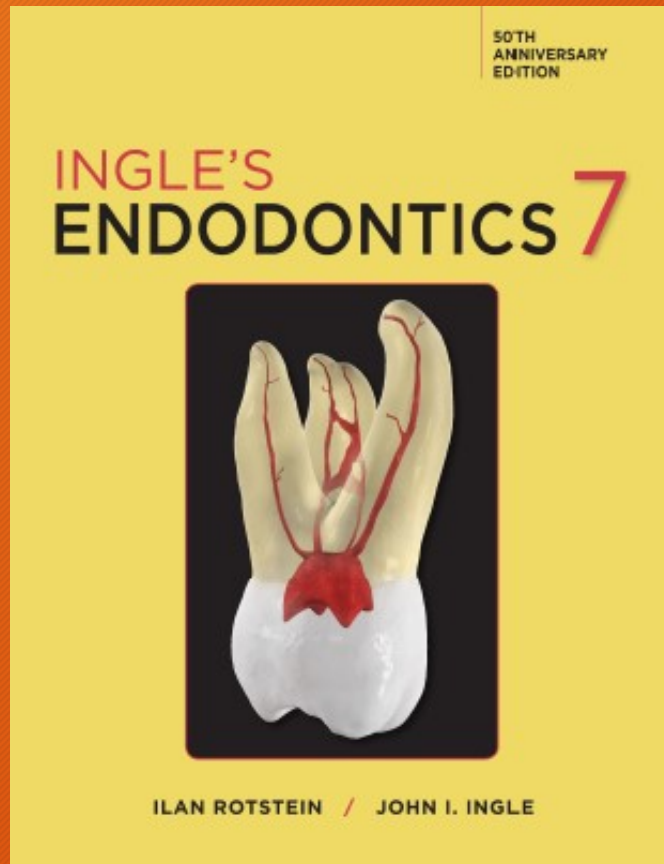








# KAYNAKLAR



## Dens Evaginatus: Literature Review, Pathophysiology, and Comprehensive Treatment Regimen

Marc E. Levitan, DDS, and Van T. Hmel, DDS

### Abstract

Dens evaginatus (DE) is an uncommon dental anomaly, having been well documented since 1925. It occurs primarily in people of Asian descent and is exhibited by protrusion of a tubercle from occlusal surfaces of posterior teeth, and lingual surfaces of anterior teeth. Tubercles have an enamel layer covering a dentin core containing a thin extension of pulp. These cusp-like protrusions are susceptible to pulp exposure from wear or fracture because of malocclusion, leading to pulpal complications soon after eruption. Endodontic intervention of permanent teeth with immature roots is unproven for inflamed pulps, and leaves a tooth with compromised root structure when treating necrotic pulps. Efforts to ensure root maturity have involved preventive or prophylactic treatment with varying degrees of pulp invaginations. Treatment options have changed as technology and materials have improved. The goal is to review the literature and pathophysiology regarding DE, and present a new comprehensive treatment regimen, including a truly prophylactic approach without pulpal invaginations. A case study of a mestizo with DE is documented. Treatment of four affected mandibular premolars exhibiting three distinct diagnostic categories will illustrate various aspects of the treatment protocol presented, and tooth morphology of the anomaly is shown to aid clinical recognition. (*J Endod* 2006;32:1-8)

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### Pathophysiology

DE is thought to develop from an abnormal proliferation and folding of a portion of the inner enamel epithelium and subjacent ectomesenchymal cells of the dental papilla into the stellate reticulum of the enamel organ during the bell stage of tooth

DE is a developmental aberration of a tooth resulting in formation of an accessory cusp whose morphology has been variously described as an abnormal tubercle, elevation, protuberance, excrescence, extension, or bulge. This uncommon anomaly projects above the adjacent tooth surface, exhibiting enamel covering a dentinal core that usually contains pulp tissue that on occasion may have a slender pulp horn which extends various distances up to the full length of the tubercle's dentin core (1). The presence of pulp within the cusp-like tubercle has great clinical significance and distinguishes the anomaly from supplemental cusps, such as the cusp of Garabelli (2), which contains no pulp. The cusp of Garabelli has been reported in 17.4 to 90% of the white population, occurring most often on the palatal aspect of the mesiolingual cusp of maxillary first molars, but is a rare occurrence in Asians (1). DE arises most frequently from the occlusal surface of involved posterior teeth and primarily from the lingual surface of associated anterior teeth. Though DE was first reported in 1892 (3), and has been well documented since 1925 (4), the etiology remains undetermined.

DE predominantly occurs in people of Asian descent (including Chinese, Malay, Thai, Japanese, Filipino, and Indian populations) with varying estimates reported at 0.5 to 4.3%, depending upon the population group studied (5). A higher incidence has been observed in specific Indonesians (Achean Natives) (up to 15%) and both American Indian (Ancestral) populations (6-8). These patterns suggest an inherited component to the trait, which can be supported by the association DE has with other developmental anomalies (5, 9, 10), such as shovel-shaped incisors that also occur with some frequency in Asian populations (1), DE, mesiodens (11, 12), and three-rooted mandibular molars (13). Both autosomal dominant and X-linked dominant inheritance patterns have been proposed (6, 14, 15).

However, reports tracing a familial history or evidence demonstrating DE occurring in siblings have been few (14). As well, there has been documentation of the unusual occurrence in whites (9, 14) and the rare occurrence in African-Americans (two cases) (16) suggesting the anomaly could be a localized developmental peculiarity, possibly from pressure exerted upon the developing tooth bud from trauma (15). Each a multifactorial etiology involving both genetic and environmental factors has been suggested (5, 15, 17).

A review of the literature reveals an abundance of terms for this anomalous dental structure, the most frequently encountered being odontome, odontoma (odontome) of the axial core type, evaginatus odontoma (evaginatus odontome), occlusal enamel pearl, occlusal tubercle, tuberculum anomalum, accessory cusp, supernumerary cusp, interstitial cusp, tuberculated cusp, tuberculated premolar, Leong's premolar, and talon cusp (specifically for anterior teeth) (5-22). While one article attempts to distinguish talon cusp from DE (23), most authors agree both are the result of an exacerbation of the same phenomena during the morphodifferentiation stage of tooth development (1, 5, 20). Talon cusp originated as a descriptive term for DE when observed on the lingual surface of anterior teeth because of a resemblance to an eagle's talon (5, 21). Currently, DE is the preferred terminology utilized to describe this developmental anomaly, first recommended by Osborn in 1967 (19).

## Dens evaginatus in the etiology of bilateral periapical pathologic involvement in caries-free premolars

### Abbreviated case report

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A case of bilateral dens evaginatus, an anomaly of premolars in persons of the Mongoloid race, is presented. This anomaly may be considered the evaginatus counterpart of dens invaginatus with similar clinical sequelae. Early diagnosis and treatment can prevent loss due to periapical pathologic involvement of these otherwise normal teeth.

Dens evaginatus (occlusal tuberculated premolar, odontome of the axial core type, Leong's premolar, evaginatus odontome) is a coronal anomaly of premolar teeth reported only in patients of Mongoloid ancestry: Japanese,<sup>1</sup> Chinese,<sup>2-4</sup> Filipinos,<sup>4</sup> Eskimos, and American Indians.<sup>5</sup> Although it has a reported incidence of 1 to 2 per cent,<sup>2-4</sup> dens evaginatus is apparently rarely recognized in this country, as evidenced by infrequent documentation in American journals and textbooks. Clinically, dens evaginatus appears as an accessory cusp located between the buccal and lingual cusps of premolars, although it has been reported to occur rarely on molar, canine, and incisor teeth.<sup>3</sup> Dens evaginatus may be unilateral or bilateral and may occur in either dental arch or in both. The anomalous cusp may vary in size and degree of occlusal wear. It is composed of enamel and dentin, with a pulpal extension into it that may be detected radiographically and histologically.<sup>6-8</sup> An acceptable pathogenesis for dens evaginatus is the proliferation and evagination of an area of the inner enamel epithelium and its subjacent

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### Case Report

## Concrescence of permanent maxillary second and third molars: case report of non-surgical root canal treatment

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**Abstract:** Concrescence is a rare developmental anomaly with an overall incidence of 0.8% in the permanent dentition. While many case reports describe the treatment of concrescence with extraction, there are few reports of non-surgical root canal treatment (NSRCT), due to the atypical root form, canal morphology, and technical difficulties involved in concrescence. This unique case report describes a technical modification of NSRCT that can retain joined posterior maxillary teeth to maintain natural posterior occlusion without surgical intervention or dental implants, thereby avoiding the risk of damage to a large portion of the alveolar bone near the maxillary sinus. (*J Oral Sci* 54, 133-136, 2012)

**Keywords:** concrescence; fused teeth; root canal treatment; tooth abnormalities/complications.

### Introduction

Concrescence is a rare dental anomaly defined as the conaxial union of two adjacent teeth (1). These joined teeth have independent pulp chambers and root canal systems. Concrescence has been reported in extraction cases with an incidence of 0.2 - 3.7% in the primary dentition and 0.8% in the permanent dentition (2). Non-surgical root canal treatment (NSRCT) is a challenge in such cases due to atypical root anatomy, unpredictable

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root canal systems, risk of missing canals, and perforations. The aim of this case report is to present a successful NSRCT of a right maxillary second and third molar joined by a conaxial union.

### Case Report

A 35-year-old female presented to private practice limited to endodontics for evaluation of dental pain. The patient's chief complaint was lingering sensitivity to cold in the maxillary right quadrant. Her medical history was unremarkable. She had no drug allergies, medications or any cardiac and/or joint diseases requiring antibiotic prophylaxis. Her dental history included routine dental care, low caries risk and good oral hygiene. The extra oral exam and perioral soft tissue exam were within normal limits. Her temporomandibular joint function was normal without any deviation upon opening or discomfort upon palpation, and the intraoral hard examination revealed a dense cortical plate in the posterior maxilla; the soft tissues had no signs or symptoms of pathology. Clinically, tooth #18 had an occlusal composite filling present and tooth #17 had an Intermediate Restorative Material (IRM, Dentsply Caulk, Milford, DE, USA), (Figs. 1A and 1B). Interestingly, the crowns and roots of these two teeth were joined and both teeth exhibited signs and symptoms of patient's chief complaint. Clinical examination and intraoral photographs did not reveal any cracks or fractures, and there was no discomfort upon percussion, palpation or bite stick testing. Her chief complaint was reproducible when teeth #17 and #18 were tested with EndoIce (Coltene Whaledent, Cuyahoga Falls, OH, USA). Radiographic examination revealed intact periodontal ligament space around tooth