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# Bölüm 1

# GEÇMİŞTEN BUGÜNE ORTODONTİK BRAKETLER

**Çağan Erkman ŞAYLAN**[1]
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## 1. MİLATTAN ÖNCEKİ DÖNEM

Ortodonti, dentofasiyal yapıların büyüme ve gelişmesinin rehberliği ve düzeltmesi ile ilgili diş hekimliği alanıdır. Dişlerin hareketini gerektiren durumlar veya dentofasiyal yapıların bozulmuş ilişkilerinin ve şekil bozukluklarının düzeltilmesi, dişler ve yüz kemikleri arasındaki ilişkilerin uyumlu olması adına kuvvetlerin uygulanması ve kraniofasiyal kompleks içindeki fonksiyonel kuvvetlerin yeniden yönlendirilmesi ile ilgilenir (1). Dişleri düzelten aparatların en eski kanıtlarının milattan önce (MÖ) 1000 civarında kullanıldığı varsayılmaktadır (2). Roma İmparatorluğu'ndan önce var olan antik bir medeniyet olan Etrüskler, ölülerini dişleri arasındaki boşluğu korumak ve diş yapısının bozulmasını önlemek için kullanılan aparatlarla birlikte defnetmişlerdir (3). MÖ 450 yılı civarında yazıldığı inanılan Roma hukukunun ilk kanunları olan Oniki Levha Kanunlarında bir kişinin dişlerini çıkaranlar için özel cezalar uygulanacağı belirtilmiştir. Muhtemelen modern ligatür tellerinin öncüsü olan altın teller ile bağlanmış dişler, Mısır'da bir Roma mezarında bulunmuştur (4). Romalı filozof ve hekim Aulus Cornelius Celsus, tıp ansiklopedisi olan *De Medicina*' da (Şekil 1) daimî dişlerin çıkmasını sağlamak için süt dişlerinin çekilmesini önermiştir. Ayrıca, Celsus, yanlış pozisyonda bulunan dişlerin tedavisi için parmak basıncını kullanan ilk kişi olmuştur ve hizalamayı sağlamak için bu parmak basıncının yeni dişlere her gün uygulanması gerektiğini belirtmiştir.

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# Bölüm 2

# SABİT ORTODONTİK TEDAVİYLE GELİŞEBİLEN BEYAZ NOKTA LEZYONLARI, GÜNCEL TEŞHİS VE TEDAVİ YÖNTEMLERİ

**Beyza KAHRAMAN BÜYÜKNALBANT[1]**
**Taner ÖZTÜRK[2]**

## 1. GİRİŞ

Sabit ortodontik tedavilerin en sık görülen yan etkilerinden bir tanesi yeni çürük lezyonlarının gelişmesidir. Tedavi amacıyla kullanılan braketler, bantlar, ligatürler ve diğer elemanların çevresinde zaman içerisinde beyaz nokta lezyonları gelişebilmektedir. Bunun nedeni bu cihazların dişlerin yüzeylerinde biriken bakteriyel biyofilmin temizlenmesini zorlaştırmasıdır(1). Başlangıç mine çürüğü olarak da adlandırılan beyaz nokta lezyonları, sabit ortodontik tedavi gören hastalarda(%46) plak tutulumu nedeniyle sık görülen bir bulgudur(2, 3). Ortodontik tedavi gören bireylerde yüksek bakteri sayısı, ortodonti tedavisi görmeyen bireylere göre plak pH'ının daha hızlı düşmesine neden olabilir. Bu da sabit ortodontik tedavi sırasında çürüğün daha hızlı gelişmesine sebep olur. Sıradan çürüklerin gelişimi genellikle en az altı ayı gerektirirken, beyaz nokta lezyonları braket tatbikinden bir ay sonra braket çevresinde görülmeye başlayabilmektedir(4). Sabit veya hareketli apareylerle yapılan tedaviler modern ortodontide önemli bir unsurdur ancak beyaz nokta lezyonları gibi gelişen yan etkiler ortodontik tedavinin estetik sonucunu da negatif yönde etkilemektedir(5). Bununla birlikte teşhis ve tedavisi yapılmayan bu lezyonlar ilerleyip kavitasyon oluşmasına neden olabilmektedirler. Bu nedenle lezyonların oluşumunu önlemek ve gelişen lezyonları tedavi etmek önemlidir.

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artırma potansiyelini göstermektedir; ancak kesin sonuçlar elde etmek için daha fazla klinik çalışmaya ve standartlaştırılmış metodolojiye ihtiyaç vardır.

## SONUÇ

Sabit ortodontik tedavi sırasında plak birikiminin kolaylaşması ve eş zamanlı olarak hastanın oral hijyen prosedürlerini ideal olarak yerine getirmekte zorlanması sebebiyle bu hasta gruplarında tedavi olmayanlara kıyasla beyaz nokta lezyonlarının görülme sıklığı artmaktadır.

Beyaz nokta lezyonlarının teşhisinde, proflaktik olarak uygulanabilecek önlemlerde ve tedavi metodlarında güncel yöntemler gelişmektedir. Bu yöntemler ile ilgili bilgi sahibi olmak ortodontik tedavi öncesinde, esnasında ve sonrasında lezyonların henüz erken evrede iken teşhis edilmesi ve tedavisinin doğru şekilde yapılması açısından son derece önemlidir. Bununla birlikte bu lezyonların özellikle tedavisi açısından yeni metotların geliştirilmesine halen devam edFormun Altıilmektedir.

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# Bölüm 3

# SINIF III MALOKÜZYON TEDAVİLERİNDE ŞEFFAF PLAKLARIN YERİ

**Tuba ÜNLÜ ÇİFTÇİ[1]**
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## 1.GİRİŞ

Sınıf III maloklüzyon, Angle'a göre alt molar dişin üst molar dişten daha mesialde konumlanması olarak tanımlanmıştır(1). Mandibular prognatizm, maksiller retrognatizm, retrüziv maksiller dentisyon, protrüziv mandibular dentisyon komponentlerinden bir veya birkaçını içerebilir(2). Maloklüzyonun köken aldığı komponent ve tedavi zamanlaması ise seçilecek tedavi yöntemi için oldukça önemlidir.

Şeffaf plak tedavileri, basit-orta dereceli çapraşıklık vakalarından kompleks maloklüzyonlara kadar kullanılabildiği bildirilen güncel bir tedavi yöntemidir. Sınıf III maloklüzyonlarda da uygulama alanı bulan şeffaf plaklar, çeşitli avantaj ve dezavantajlara sahiptir.

Bu bölümün amacı, sınıf III maloklüzyonlarda uygulanan tedavi yöntemlerini güncel bir bakış açısıyla sunmak, güncel bir yöntem olan şeffaf plak tedavilerinin sınıf III maloklüzyon tedavilerindeki uygulama alanlarının incelenmesidir.

## 2.GENEL BİLGİLER

### 2.1.Sınıf III Maloklüzyon Tanımı

Maloklüzyon; dişlerin anormal pozisyonlanması, diş arkları, çene kemikleri ve kafa kemikleri arasındaki kötü ilişki olarak tanımlanmıştır(3). Karma dişlenme döneminde tedavisi en zor problemleren olan Sınıf III maloklüzyon, tek bir tanısal varlığı kapsamaz ve farklı bileşenlerden oluşur(4). Guyer ve ark. 5-15 yaş aralığındaki 144 bireyi inceledikleri çalışmalarında sınıf III maloküzyon

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# Bölüm 4

# MANDİBULAR MOLAR DİSTALİZASYONU

**Ezgi SUNAL AKTÜRK[1]**
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## 1.GİRİŞ

Mandibular molar distalizasyonu, mandibular arkta yer kazanmak amacıyla mandibular molar dişleri distale hareket ettirerek diş çekimi yapmadan uygulanan bir ortodontik yaklaşımdır (1). Molar distalizasyonu hafif veya orta şiddette çapraşıklığın çekimsiz olarak tedavisini mümkün kılmaktadır. Bunun yanında büyüme modifikasyonuyla tedavinin mümkün olmadığı hafif ve orta derecede Sınıf III maloklüzyona sahip olan veya ortognatik cerrahi ile tedaviyi reddeden hastalarda mandibular molar distalizasyonu uygulamaları ile kamuflaj tedavileri uygulanabilmektedir. Hem maksiller hem de mandibular arkın distalizasyonuyla ise bimaksiller prognati vakaları tedavi edilebilmektedir (2,3).

Mandibular molarların distalizasyonundaki başarıyı etkileyecek önemli faktörler arasında yeterli kemik kalitesi ve yeterli yerin bulunması, kök morfolojisinin uygunluğu, kortikal kalınlık ve anatomik varyasyonlar yer almaktadır (3, 4).

Mandibular molarların distalizasyonunda her ne kadar ramus ön sınırı sınırlayıcı bir faktör olarak görülse de klinik uygulamada sadece kuron seviyesinin değil, kök seviyesindeki anatomik sınırlamaların da dikkate alınması büyük önem taşımaktadır. Kök seviyeleri ile ilgili olarak, önceki çalışmalar mandibulanın posterior bölgedeki mevcut alan genişliğinin molar distalizasyonu için sınırlayıcı bir faktör olmadığını, asıl önemli olanın mandibular retromolar alanın (MRSL) uzunluğu olduğunu göstermiştir (5). Aksi yönde çalışmalar olmakla birlikte, literatürdeki birçok çalışma Sınıf III maloklüzyon vakalarında retromolar alanın Sınıf I maloklüzyona göre anlamlı derecede büyük olduğu bulunmuştur (6-8).

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# Bölüm 5

# VERTİKAL YÖN PROBLEMLERİNİN ŞEFFAF PLAKLAR İLE TEDAVİSİ

**Tuğçe KAYACI**[1]
**Mine GEÇGELEN CESUR**[2]

## GİRİŞ

Neredeyse 20 yıldır şeffaf plaklar, hastaların estetik ortodontik tedaviye yönelik taleplerini başarılı bir şekilde karşılamak için giderek artan bir popülariteyle kullanılmaktadır. Dünyanın her yerindeki pek çok şirket, dişleri kademeli ve sıralı olarak istenen pozisyonlara hareket ettirmek için tasarlanmış özel yapım şeffaf hizalayıcılar üretme yöntemleri geliştirmiştir. Şeffaf plaklarla tedavi etkinliğinin iyi olduğu rapor edilmiştir ancak bilimsel kanıt ve daha fazla klinik gelişme için bu tür ortodontik tedavi yönteminin çeşitli yönlerinin daha fazla araştırılmasına ihtiyaç vardır. Bu bölümde, şeffaf plaklar ile derin kapanış ve açık kapanış maloklüzyonlarının tedavisi anlatılmıştır. (1)

## 1. DERİN KAPANIŞ MALOKLÜZYONU

Derin kapanış, overbite'ın artması olarak tanımlanır ve kesici dişlerin oklüzal düzleme dik olarak vertikal olarak örtmesi ile ölçülür. Dentoalveoler kökenli (ön dişlerin fazla erüpsiyonu) ve iskelet kökenli (azalmış alt yüz yüksekliği ve azalmış alt düzlem açısı) olarak ayrılabilir. Derin kapanış prevalansı uygulanan eşik değerlerine, etnik gruba ve cinsiyete bağlı olarak %8 ile %51 arasında değişmektedir. Derin kapanış ile sagittal molar maloklüzyonu arasındaki korelasyon vardır. Özellikle sınıf II molar maloklüzyonun, sınıf I maloklüzyonla karşılaştırıldığında artan overbite ile anlamlı bir ilişkisi vardır. Sıklıkla Sınıf II bölüm 2 oklüzyona eşlik etmektedir(2)

Sabit tedavi yerine şeffaf plak kullanan ortodontist, üst dişlerin proklinasyonunu ve intrüzyonunu sağlayıp alt arkı yapıştırmak için birkaç ay beklemek yerine her

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# Bölüm 6

# ORTOGNATİK CERRAHİ TEDAVİDE AMELİYAT ZAMANLAMASI VE HASTA SEÇİM KRİTERLERİ

**Halime SARAÇ KALE[1]**
**Gökhan ÇOBAN[2]**

## 1. GİRİŞ

Büyüme gelişimi tamamlanmış ve ortodontik problemleri büyüme modifikasyonu ya da kamuflaj tedavileriyle düzeltilemeyecek şiddetteki hastaların dentofasiyal anomalilerinin tedavisinde ortognatik cerrahi prosedürleri uygulanmaktadır. (1) Ortognatik cerrahi tedavi ile hem iskeletsel yapıların düzeltilmesi hem de fonksiyonel yönlerin iyileştirilmesi sağlanmaktadır. Son zamanlarda, hastalar tarafından, özellikle estetiğin iyileştirilmesi amacıyla ortognatik cerrahiye olan talep artmış durumdadır(2)

Cerrahi olarak, yeterli teknik, gelişmiş rijit fiksasyon sistemleri ve sert ve yumuşak doku iyileşmesinin daha iyi anlaşılmasının birleşimi komplikasyon oranlarını azaltmış, cerrahi sınırları tekrardan tanımlamış ve girişimsel, minimal invaziv protokollerin geliştirilmesine olanak sağlamıştır. Tıbbi olarak, hipotansif anestezi kullanımı ve ardından kanama ve ödemin azaltılması, ortognatik cerrahiyi sıklıkla ayakta tedavi bağlamında gerçekleştirilebilen güvenli ve güvenilir bir prosedür olarak pekiştirmiştir(3)

Geleneksel konsept ortognatik tedavi, ameliyat öncesi ortodontik hazırlığın değişken sürelerini, ameliyatın kendisini ve nispeten stabil bir ameliyat sonrası ortodonti dönemini gerektirir. Özellikle, bu aşamalar ameliyat öncesi 15 ila 24 ay ve ameliyat sonrası 7 ila 12 ay arasında sürme eğilimindedir (3)

Toplumun zamanla bilinçlenmesi ve zaman kavramının hem hekim hem de hasta için daha anlamlı hale gelmesi, ortognatik cerrahiye gereksinim duyan hasta sayısının gün geçtikçe artması vb. sebepler sonucunda araştırmacıların odağı ortodontik ve cerrahi tedavilerin zamanlaması ve süresi üzerine yoğunlaşmıştır.

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- Yapılan çalışmalara göre 'Önce Cerrahi' ve 'Erken Cerrahi' Grupları tedavi süresi bakımından 'Geç' ve 'En Son Cerrahi' Gruplarına göre daha kısa sürmektedir.
- 'Önce Cerrahi', 'Erken Cerrahi' ve 'En Son Cerrahi' Gruplarında ana motivasyon genellikle yüz estetiğidir.
- 'Geç Cerrahi' Grubunda ise ana motivasyon genellikle optimal oklüzyondur.
- 'En Son Cerrahi' teknikte alveolar kemik hasarı ve kök rezorpsiyon riski genellikle güçlü sınırlayıcı faktörlerdendir.
- Uykuda solunum bozukluğu tedavisinde genellikle uygulanan teknik 'Sadece Cerrahi' tekniğidir.
- Dento-maksillofasiyal deformitelerin ustaca yönetimi, hastaya, ortodontiste ve cerraha özgü değişkenlerin kapsamlı bir analizini gerektirir.

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# Bölüm 7

# DENTOFASİYAL & TME PROBLEMLİ ORTODONTİK VAKALARDA KÖK HÜCRE KULLANIMI

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## MAKSİLLAR EKSPANSİYONDA KÖK HÜCRE KULLANIMI

Maksillar ekspansiyon, posterior dişlerin vestibüler alveol kemiğe doğru hareketi olarak tanımlanabilir ve dental arklarda boşluk yaratılması, diş pozisyonlarının düzeltilmesi, transversal intermaksiller uyumun sağlanması, bukkal koridorların genişletilmesi gibi endikasyonlarla birlikte sabit apareylerle elde edilir (1). Üst çene genişletmesini takiben ortodontik tedavi, estetik ve konfor açısından hastalar için zor bir dönemdir. Ayrıca, genişlemeden sonra erken nüksü önlemek için yeni kemik oluşumu ve rejenerasyonunu indüklemek çok önemlidir. Bu amaca ulaşmak için, osteoblastları teşvik etmeyi ve böylece sütürdeki kemik oluşumunu iyileştirmeyi amaçlayan çeşitli terapötik yaklaşımlar denenmiştir. Sınırlı başarı getiren bu çalışmalar, çoğunlukla TGF-b veya D3 vitamini gibi genellikle kısa bir yarılanma ömrüne sahip biyoaktif moleküllerin enjeksiyonunu içermektedir (2).

Kemik iliği stromasından kaynaklanan mezenkimal kök hücreler (MKH), kemik dokusu mühendisliği için ilgi çekici bir kaynaktır (3). Yapılan çalışmalarda MKH›lerin lokal olarak verilmesinin yara iyileşmesini, vaskülarizasyonu ve kıkırdak oluşumunu arttırdığı gösterilmiştir (4).

Ekizer ve ark. (2) yaptıkları çalışmada, bir sıçan modelinde interpremaksiller sütürün genişlemesine yanıt olarak lokal MKH uygulamasının kemik oluşumu üzerindeki etkisi araştırmışlardır. Toplam 19 erkek Wistar sıçanı, 9 kontrol ve 10 deney olmak üzere iki gruba ayrılmış; her iki grup da 5 gün boyunca ekspansiyona tabi tutulmuştur. 5 gün sonra ekspansiyon için takılan yaylar çıkarılmış ve yerine retansiyon için başka bir tel takılmıştır. Genişleme başladıktan yirmi dört saat sonra hayvanlar uyuşturulmuş ve interpremaxillar süturlara tedavi grubunda

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farklılaşması doğrulanmıştır. Yapılan bu çalışmalar ışığında gelecekte TMD tedavisi için kök hücre kaynaklarının kullanılmasında artış olacağı düşünülmektedir (56).

## SONUÇ

Kök hücreler, hücre biyolojisindeki en ilginç hücrelerdir. Gelecekteki en güçlü teknolojilerden biri olacakları düşünülmesi sebebiyle bilim dünyası ile birlikte ortodonti alanında da araştırıcıların merakını cezbetmekte ve gerek in vitro gerekse klinik öncesi çalışmalar halihazırda yürütülmesine rağmen klinik kullanıma başlanması ve rutin uygulamaların yapılabilmesi için kapsamlı ve detaylı daha fazla çalışmalara ihtiyaç olduğu aşikardır.

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# Bölüm 8

# ORTODONTİK DİŞ HAREKETİ VE KÖK REZORPSİYONUNDA KÖK HÜCRE KULLANIMI

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## GİRİŞ

Hücre terimi ilk defa 1665 yılında ortaya atılmış olup; vücuttaki en küçük yapı birimi olarak tanımlanabilir. Kök hücreler ise üreyebilen, kendini yenileme kapasitesine ve bir veya daha fazla progenitör üretme yeteneğine sahip farklılaşmamış hücrelerdir (1,2). Kök hücrelerin uygun uyaranlar altında özelleşmiş hücrelere dönüşebilme kapasitesine ''plastisite'' ya da ''differansiyasyon'' adı verilir. Kök hücrelerde simetrik ve asimetrik olmak üzere iki farklı bölünme vardır. Simetrik hücre bölünmesinde ana hücreyle aynı özellikleri taşıyan iki yeni hücre meydana gelirken; asimetrik bölünmede ise oluşan iki hücreden biri ana hücreyle aynı iken; diğer hücreden progenitör hücre oluşmaktadır. Oluşmuş olan progenitör hücre de ileride farklılaşmış olgun hücreleri meydana getirmektedir (3).

Kök hücreler elde edildikleri kaynaklara göre başlıca iki gruba ayrılmaktadır:

1. Embriyonik Kök Hücreler
2. Embriyonik Olmayan (Yetişkin) Kök Hücreler
   a. Hematopoetik kök hücreler
      - Kemik iliği kök hücreleri
      - Periferik kan kök hücreleri
      - Göbek kordon kanı kök hücreleri
   b. Stromal (mezenkimal) kök hücreler
   c. Organlarda yerleşik diğer erişkin kök hücreleri (4).

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Sonuç olarak, hem SHEDS'ler/TDM'ler hem de DFKH'ler/TDM grupları, ikisi arasında bariz bir fark olmaksızın periodontal dokuları başarılı bir şekilde rejenere etmiştir ve bu çalışma her iki hücre stratejisinin de uygulanabilir olduğunu ve SHED'lerin periodontal ve kök rejenerasyonunda kullanım için alternatif bir hücre kaynağı olduğunu doğrulamıştır (90).

## SONUÇ

Yapılan araştırmalar sonucunda kök hücrelerin hedef doku ve organlara farklılaşarak ortodontik tedavilerin sonuç ve sürelerinde pozitif bir etkiye sahip olabileceği düşünülmektedir. Pahalı bir yöntem ve multidisipliner bir yaklaşım olup kullanımı için çok fazla deneyim gerektirmesine rağmen ileriki dönemlerde ortodontistlerin bu terapiyi günlük olarak kullandıkları düşüncesi yapılan ve yapılacak çalışmalar için ilham kaynağı olmaya devam etmektedir.

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