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BÖLÜM 1

ORTOGNATİK TEDAVİ VE KÖK REZORPSİYONU

Merve Ece ERDEM[1]
Celal IRGIN[2]

GİRİŞ

Ortognatik tedavi, maksilla ve mandibulanın cerrahi yöntemlerle yeniden konumlandırılmasıyla iskeletsel anomalilerin, malokluzyonların, yüz profilinin ve hava yolunun iyileştirilmesini sağlayan bir tedavi yöntemidir (1, 2). Şiddetli iskeletsel uyumsuzluğa sahip, büyüme ve gelişimi tamamlanmış erişkin hastalarda hem iskeletsel hem de dentoalveolar yapıyı düzeltmek için ortodontik tedaviyi cerrahi ile birleştirerek uygulanan ortognatik tedavi günümüzde yaygın olarak uygulanmaktadır (3). Maksiller-mandibular retrüzyonlar, maksiller vertikal yetersizlik ve mandibular prognati en sık ortognatik tedavi gerektiren dentofasiyal deformitelerdir. Bu deformitelerin tedavisinde maksilla için Le Fort I osteotomisi, mandibula için ise bilateral sagital split ramus osteotomisi (BSSRO) günümüzde popüler olarak uygulanan cerrahi tekniklerdir (4).

Ortognatik tedavi prosedürleri invaziv işlemlerdir. Ortognatik cerrahi sonrası kan akımının geçici olarak azalması ile iskemi oluşabilmekte, osteoklastik aktivitedeki artış ve cerrahi ile dokularda meydana gelen travma neticesinde diş ve çevre dokular olumsuz olarak etkilenebilmektedir. Bu değişimlere bağlı olarak nekroz, alveolar kemik kaybı, dişeti çekilmesi, kök rezorpsiyonu, pulpa obliterasyonu meydana gelebilmektedir. Cerrahi sırasında dişlere direkt zarar verildiğinde ise dişlerde devitalizasyon ve kanal tedavisi ihtiyacı veya diş kaybı olabileceği gibi cerrahi sonrası ağız hijyenini sağlamadaki zorluklara bağlı olarak mukogingival dokularda istenmeyen değişikliklerde görülebilmektedir (5-8).

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BÖLÜM 2

ORTODONTI VE 3 BOYUTLU STEREOFOTOGRAMETRI

Berna EVRENOL[1]
Sanaz SADRY[2]

GİRİŞ

Gelişen teknoloji, medikal hayatın her alanına olduğu gibi diş hekimliğine de çeşitli yenilikler getiriyor. Özellikle teşhis ve tedavi planlamasında kullanılan cihazlar son teknolojiye uyum sağlayarak sürekli değişiyor ve gelişiyor. Böylece ortodontik tedavi gibi başlangıç bitiş kıyaslanması yapılan branşların da bu teknolojik gelişmeleri takip etmesi kaçınılmaz olmaktadır.

Yıllardan beri ortodonti hastalarının rutin olarak alınan başlangıç kayıtları, ara kayıtları ve bitiş kayıtları ile hastanın diagnozu, tedavi planlaması ve stabilite kontrolü dikkatli ve detaylı bir şekilde takip edilebilmektedir.

Ortodontik tedavide alınan kayıtlar kemik ve dişler ile ilgili sert doku kayıtları (sefalometrik, panoramik, anteroposterior röntgenler veya 3D tomografi) ve yumuşak dokuyu inceleyebİleceğimiz fotoğraf kayıtlarından oluşmaktadır.

Teknolojinin gelişmesi ile fotoğraf kayıtlarının yerini 3 boyutlu modellemeler almaya başlamıştır. Hızla gelişen teknolojiye rağmen günümüzde özellikle yumuşak doku morfolojisini incelerken 3 boyutlu stereofotogrametri en ideal ve kabul gören anamnez araçlarından biri olarak kabul edilmektedir(1-3). Gelişen sistemler ve yazılımlar aracılığı ile vücudun bir bölgesinin veya tamamının üç boyutlu kaydını almak çok hızlı olmaktadır. Stereofotogrametri sistemlerinde 1.5 milisaniye gibi bir zamanda görüntü almak mümkündür (1-3)Bu bölümde, 3 boyutlu stereofotogrametrinin ne olduğu, nasıl geliştiği, stereofotogrametri sistemleri, görüntü elde etme yöntemleri ve ortodonti alanında kullanımdaki avantajları ve dezavantajları hakkında bilgi verilecek ve ortodonti rutinine girebilmesi için gerekli olanlar tartışılacaktır.

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BÖLÜM 3

ORTODONTİDE DİJİTAL TEKNOLOJİLER

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GİRİŞ

Son yıllarda teknoloji alanında yaşanan gelişmeler diş hekimliği alanında da olmak üzeri birçok alanda kullanılmaktadır. Bilgisayar destekli tasarım (CAD) ve bilgisayar destekli üretim (CAM) teknolojilerinin ortaya çıkışı, 3 boyutlu (3D) baskı üretimini gerçekleştiren 3D yazıcıların kullanımı, ağız içi tarayıcı gibi bilgisayar destekli yazılım ve donanım araçlarının kullanımı ortodonti pratiğinde yaygınlaşmıştır. Dijital iş akışının ortodontik tedavilere entegre edilmesiyle, teşhis yöntemlerinin geliştirilmesi, farklı tedavi seçenekleri ve planlamalarının kullanımı gibi hekimin konfor alanını genişleten güncellemeler yaşanmaktadır. Ortodontik tedavilerin başarısını arttırmak için güncel ve dijital teknolojilerin bilinmesi, araştırılması ve geleneksel yöntemlerle karşılaştırılması önem teşkil etmektedir.

DİJİTAL ÜÇ BOYUTLU TEKNOLOJİLER

1970'li yıllarda Duret ve Preston tarafından diş hekimliği pratiğine dahil edilen bilgisayar destekli tasarım (CAD) ve bilgisayar destekli üretim (CAM) sistemi; toplanan veriler ile farklı ürün tasarlamak ve bunları üretmek için kullanılan bilgisayar destekli bir teknoloji sistemidir. CAD/CAM teknolojisi, bilgisayar yazılımı aracılığıyla üç boyutlu (3D) görüntülerin manipülasyonuna ve özelleştirilmiş cihazlar sayesinde farklı malzemelere 3D yazdırılmasına olanak tanır (1). CAD/CAM teknolojisi ile hastaların diş arklarının dijital görüntüsünün alınması; bu görüntülerin belirli bir yazılımda görselleştirilmesi ve işlenmesi; tasarlanan cihazların üretileceği modeller 3D baskı dosyaları oluşturulur. Bu işleme dijital iş akışı adı verilir (1).

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3D baskının avantajları olduğu gibi maliyetinin yüksek olması, özel teknik beceri gerektirmesi gibi limitasyonları da mevcuttur (55). Centenero ve ark (43) yaptığı çalışmada 3D görüntülemenin, cerrahın sert ve yumuşak dokunun asimetrisi ve kant gibi fenomenleri içeren malformasyonları değerlendirmesini kolaylaştırdığını bildirmiştir. Özetle, 3D baskı, bazı sınırlamaları olmasına rağmen ortognatik cerrahide bir dizi avantaj sunmaktadır. Hassas, özelleştirilmiş cerrahi yardımcılar üretme yeteneği, geleneksel yöntemlere göre önemli bir ilerlemeyi temsil etmektedir.

SONUÇ

Dijital teknolojilerin ortodontide kullanımın yaygınlaşmasına bağlı olarak hastalar için daha estetik, konforlu, hızlı tedavi seçenekleri sunulabilmektedir. Hekim için de tedavi planlanması ve tedavi seçeneklerinin geliştirilmesine imkân tanımaktadır. Dijital iş akışı 3 boyutlu yazılımlar ile tedavi simülasyonlarına olanak tanımakta olup hasta hekim arasındaki iletişimi de arttırmaktadır. Dijitalleşmenin en büyük dezavantajı ise kullanılan cihazların ve sanal programların maliyetleri ve bu cihazlarla çalışacak olan personelin eğitimleri için gerekli yatırımlardır.

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BÖLÜM 4

TEMPOROMANDİBULAR EKLEM PROBLEMLERİNİN TEDAVİSİNDE GENEL YAKLAŞIMLAR KISIM 1: KESİN TEDAVİ YAKLAŞIMLARI

Cansu DÜZGÜN[1]

GİRİŞ

ÇEŞİTLİ TEMPOROMANDİBULAR BOZUKLUKLARIN BİRBİRLERİYLE İLİŞKİLERİ

Temporomandibular eklem bozukluklarında (TMB) doğru teşhis koymak ve tedavi uygulamak çoğu zaman zor ve karmaşık olabilmektedir. Hastaların semptomlarının çoğunlukla tek bir hastalığın özelliklerine birebir uymaması, gerçekte hastaların birden fazla rahatsızlıktan muzdarip olmaları, özellikle teşhis konulmasını zorlaştırmaktadır. Aslında, birçok hastada sadece birkaç durum bir arada bulunmakla kalmaz, aynı zamanda bir bozukluk diğerinin oluşumuna katkıda bulunabilir. Bu nedenle, birden fazla bozukluk mevcut olduğunda, birincil bozukluğu ikincil bozukluktan ayırt etmek için bir girişimde bulunulması uygundur.

Hastaların değerlendirilmesinde ve tedavisinde çeşitli temporomandibular bozuklukların karşılıklı ilişkisi her zaman dikkate alınmalıdır. Örneğin lokal miyalji veya miyofasial ağrı gibi çiğneme kaslarındaki bir bozukluktan muzdarip bir hasta, genellikle ilk şikayetini kas ağrısı olarak söyleyecektir. Kaslardaki bu durum zamanla eklem içi basınç artışı ve subklinik olarak diskte düzensizliğe neden olacak ve eklemlerden 'clicking' tarzında ses gelme olasılığını artıracaktır. Burada çiğneme kaslarındaki bozukluk, eklem diskinde düzensizliğe neden olmuştur. Başka bir hasta çenesine aldığı hafif bir travmadan sonra ekleminden 'clicking' şeklinde ses geldiğinden şikayetçi olabilir. Eğer bu seslere ağrı da eşlik ediyorsa, kaslar fazladan kasılarak çene hareketlerini kısıtlamaya dolayısıyla ağrılı hareketi engellemeye yönelik harekete geçebilir. Bu da lokal miyaljiye sebep olur. Burada diskteki bir bozukluk ikincil olarak kas ağrısına yani miyaljiye sebebiyet vermiştir.

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artan stres sevileri ile ilgili olabilir. Diurnal aktivite genellikle hastanın farkındalık seviyesine getirilebildiğinden, hasta eğitimi ve bilişsel farkındalık stratejileri ile iyi yönetilir. Hasta eğitimi, dişlerin sadece çiğneme, konuşma ve yutma sırasında temas etmesi gerektiğini hastaya bildirerek başlamalıdır. Diğer tüm zamanlarda çene, dişler birbirlerinden ayrı olacak şekilde yerleştirilmelidir.

Nokturnal bruksizm ise diş temaslarından değil (37), daha çok duygusal stres seviyeleri (38) ve uyku düzenleri (33) gibi diğer faktörlerden etkileniyor gibi görünmektedir. Bu farklılıklar nedeniyle, noktürnal bruksizm hasta eğitimine, rahatlama ve biofeedback tekniklerine ve oklüzal değişikliklere zayıf yanıt verir (39). Bazı durumlarda, oklüzal aparey tedavisi ile etkili bir şekilde (en azından kısa bir süre için) azaltılabilir (40). Ancak, bir uyku laboratuvarında kaydedildiği üzere, oklüzal aparey tedavisinin gece bruksizmi üzerindeki uzun vadeli etkileri etkileyici değildir. Aslında, bir çalışmada (41), deneklerin sadece %36'sında gece bruksizmi azalırken, %43'ünün aktivitesinde artış görülmüştür. Oklüzal apareylerin bruksizmi etkileme mekanizması net değildir.

Diurnal ve nokturnal parafonksiyonel aktiviteler karakter ve köken olarak farklı olabileceğinden, bunların tanımlanması ve ayrılması önemlidir. Genellikle bu ayrım, semptomların zamanlamasına ilişkin dikkatli bir öykü ile yapılabilir (örneğin, gece bruksizmi ile ilişkili uyanma sırasında ağrı). Mevcut parafonksiyonel aktivite türünün belirlenmesi daha etkili tedavi seçimine olanak sağlar.

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BÖLÜM 5

TEMPOROMANDİBULAR EKLEM PROBLEMLERİNİN TEDAVİSİNDE GENEL YAKLAŞIMLAR KISIM 2: DESTEKLEYİCİ TEDAVİ YAKLAŞIMLARI

Cansu DÜZGÜN[1]

GİRİŞ

Destekleyici tedaviler, temporomandibular bozukluk (TMB) bulunan hastaların semptomlarını değiştirmeye yöneliktir ve genellikle bozukluğun etiyolojisi üzerinde hiçbir etkisi yoktur. Birçok hasta TMB'tan büyük ölçüde muzdarip olduğundan, destekleyici tedavi genellikle semptomların anında rahatlamasını sağlamada son derece yararlıdır. Bununla beraber destekleyici tedavinin yalnızca semptomatik olduğunu ve kesin tedavinin yerine geçmediği her zaman hatırlanmalıdır. Uzun süreli tedavi başarısı elde edilebilmesi için etiyolojik faktörlerin ele alınması ve ortadan kaldırılması gerekir. Destekleyici tedavi, ağrı ve işlev bozukluğunun azaltılmasına yöneliktir. İki genel destekleyici tedavi türü farmakolojik tedavi ve fizik tedavidir.

FARMAKOLOJİK TEDAVİLER

Farmakolojik tedaviler TMB semptomlarını azaltmada yardımcı olurlar fakat hastaların bu ilaçların kesin tedavi yöntemi olmadığını bilmeleri gerekir. En sık kullanılan ilaç grupları analjezikler, antiinflamatuarlar, kas gevşeticiler, anksiyolitik ajanlar, antidepresanlar, antikonvülsif ajanlar, enjekte veya topikal olarak uygulanan ilaçlardır. Klinisyenlerin ilaçların reçete edilme şekline de dikkat etmesi gerekir. Birçok TMB periyodik veya döngüsel semptomlar gösterdiğinden ilaçların 'gerektiğinde al' şeklinde reçete edilme eğilimi vardır. Hastaların bu şekilde yönlendirilmesi, ilaçlara psikolojik veya fiziksel bağımlılığa yol açabilir (1). Genel öneri, TMB için ilaç endike olduğunda belirli bir süre için düzenli aralıklarla ilacı reçete etmektir.

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Akupunktur bazı TMB semptomlarında başarıyla kullanılmıştır (79) ancak hastalar daha geleneksel tedavileri tercih ediyor gibi görünmektedir (80). Akupunkturun TME ağrısı için oklüzal splint kadar etkili olduğunu gösteren çalışmalar mevcuttur (81). Akupunktura eklenen elektrik stimülasyonunun (elektrik akupunkturu) endojen opioid sisteminin aktivasyonu yoluyla ağrıyı azalttığı gösterilmiştir (82). Akupunkturun TMB semptomları üzerinde bir miktar etkisi olsa da etki mekanizması tam olarak anlaşılamamıştır. Bu alanda daha fazla araştırma yapılması kesinlikle gereklidir (83).

Akupunktur ve TENS benzer mekanizmalar ile çalışıyor gibi görünse de fizyolojik olarak farklı olduklarını gösteren bazı kanıtlar vardır. Akupunkturun ağrı modülasyonu için endorfinleri kullandığı görülürken, TENS bunu yapmayabilir (84).

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BÖLÜM 6

EXTRAALVEOLAR MİNİ İMPLANTLARIN ORTODONTİDE KULLANIMI

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GİRİŞ

Başarılı bir ortodontik tedavi için ankraj kontrolü çok önemlidir. İdeal ankrajın sağlanması, ankrajı güçlendirmek için geliştirilen çeşitli yöntemlerin çoğu (headgear, intermaksiller elastik kullanımı vb.) hasta uyumuna bağlı olduğundan genellikle zordur (1). Geçici ankraj aygıtlarının (TAD) yaygın olarak kullanılması ile ankraj güçlendirilerek daha öngörülebilir diş hareketleri elde edilmiştir. Bu anlamda geçici ankraj aygıtlarından biri olan minividalar, ortodontik tedavide iskeletsel ankraj sağlamak amacıyla üretilmiştir (2). Minividaların hasta kooperasyonuna gerek kalmadan çeşitli ortodontik kuvvetlere dayanma özelliği, düşük maliyeti, biyouyumluluğu, yerleştirme ve çıkarma kolaylığı nedeniyle her geçen gün ortodontik tedavide kullanımı artmıştır (3,4). Minividalar, maksilla ve mandibulada çeşitli bölgelere yerleştirilebilmektedir ve nispeten düşük başarısızlık oranına (yaklaşık %13,5) sahiptir (5). Bununla birlikte çok sayıda çalışma, minividaların başarı oranı ile yerleştirme bölgesinin anatomisi arasında güçlü bir korelasyon olduğunu göstermektedir (6). Minividaların başarısında göz önünde bulundurulması gereken en önemli faktörlerden biri, yerleştirme yerindeki kemik kalınlığı ve kalitesidir (7). Ayrıca, minividaların kök ile teması başarısızlığın en sık nedenlerinden biri olarak kabul edilir. Bu nedenle minividaları kök ile temas etmeden yerleştirmek için uygun bir yöntem bulmak önem arz etmektedir (8).

Son dönemde mandibular bukkal shelf ve IZC bölgeleri minivida uygulamaları için ekstraradiküler yerleştirme yeri olarak yaygın bir şekilde kullanılmaktadır. Ayrıca interradiküler minivida uygulamalarına kıyasla daha yüksek başarı oranına sahiptir (9).

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BÖLÜM 7

SINIF II MALOKLÜZYONLARIN FONKSİYONEL TEDAVİLERİ

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GİRİŞ

Baş ve yüz bölgesindeki iskeletsel yapılardaki denge bazı çevresel ve kalıtsal faktörlerin etkisi ile bozulabilir ve iskeletsel düzeyde birtakım uyumsuzluklar oluşabilir (1). Sınıf II maloklüzyonlar ortodontide sıklıkla rastlanılan anomalilerdendir ve popülasyonun neredeyse %30'unda rastlanılmaktadır (2). Angle 1899'da maksiller kesici dişlerin konumlarına göre Sınıf II maloklüzyonları Sınıf II Bölüm 1 ve Sınıf II Bölüm 2 olarak sınıflandırmıştır (3). Sınıf II Bölüm 1 maloklüzyonlarda artmış overjet ve protrüziv üst keser dişler görülürken, Sınıf II Bölüm 2 maloklüzyonlarda aşırı dik üst keserler ve artmış overbite ile karakterizedir (4).

Fonksiyonel ortodontik tedavi çenelerin yapı bozukluklarının ve yanlış pozisyonlarının fonksiyonel uyarıcılar ile elde edildiği bir tedavidir (5). Kaslar aracılığı ile çene kemiklerine veya dişler aracılığı ile periodontal ligament ve alveolar kemiklerine kuvvetler iletilerek kemiğin yapısını düzenlemektedirler (6).

Fonksiyonel ortopedik tedavi amacıyla kullanılan apareylere fonksiyonel ortopedik apareyler denir. Sınıf II fonksiyonel ortopedik aygıtlar; mandibulayı aşağıda ve önde pozisyonlandırarak; yumuşak doku ve kaslarda oluşan gerilime bağlı basıncın dişsel ve iskeletsel yapılara iletmesi sonucu meydana gelen büyüme modifikasyonu ve diş hareketi ile mandibular yetersizlik vakalarının tedavisini sağlar (5,7). Fonksiyonel tedavilerde; apareyler hareketli (aktivatör, bionatör, frankel, twinblok vb.) veya sabit (herbst, forsus, powerscope, jasper jumper, mara vb.) olarak kullanılabilir.

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KAYNAKLAR

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BÖLÜM 8

ORTODONTIDE ŞEFFAF PLAKLARA GENEL BAKIŞ

Pervin BİLGİNER[1]

GİRİŞ

Ortodontik tedavi tekniklerinin yaşadığımız yüzyılda teknolojiye paralel olarak süratle gelişmesi ile bu tedavi biçimine olan ilgi her yaş gurubunda giderek artmaktadır. Gelişmiş aygıtların çocuk hastalar tarafından daha kabul edilebilir hale gelmesi, ebeveynlerin geçtiğimiz yüzyıla göre daha bilinçli olması, estetik algının modern yaşamda çocukluk yaşlarında bile gelişiyor olması, daha çok diş hekimliği ziyareti çocuk ve genç hastaların sayısında artış oluşturmuştur. Gelişmiş ülkelerdeki nüfusun yaşam kalitesinin artarak sağlıklı ve doğal yaşlanması ve bireylerin kendi dişlerini kullanarak geçirdikleri yaşam dilimlerinin uzaması çocuklar kadar yetişkinlerin de ortodontik tedaviye eskisine göre daha fazla ilgi duymasına yol açmıştır. Modern dünyada dış görünüşün öneminin genç yaşlı çocuk ayrımı gözetmeksizin her yaş için yükselişi ile birlikte ortodontik tedavilerin estetik sonuçlarının arzulanması bir yana tedavi süreçlerinin de estetik bir şekilde yapılabilmesi hekimlerden talep edilir olmuştur. Bütün bunlara ek olarak ortodontik aygıt üreten teknoloji firmalarının pazarlamalarını bilginin hızla yayıldığı internet ortamını da kullanarak doğrudan tüketiciye yapmaları estetik ortodontik araçlara olan talebi arttırmaktadır. Yetişkin bireylerin işe alım süreçlerinde ortodontik tedavileri için kullanılan ortodontik apareylerin önemini araştıran bir çalışmada braket kullanan yetişkinlerin işe alım mülakatları esnasında diğer adaylardan daha az başarılı ve yetersiz algılandıklarına dair bir çalışma mevcuttur (1). Hızlı teknolojik atılımların diagnostik tıp ve diş hekimliği ile ilişkisi ve ortodonti alanındaki son gelişmeler, üç boyutlu yazıcıların kullanımının diş hekimliği alanında da yaygınlaşarak bu yazıcılarda ürün üretiminde kullanılan polimer plastiklerinin çeşitliliğinin artması (2), üretimi üç boyutlu yazıcı ve polimer esaslı plastiklere dayanan ve herkes tarafından ortodontinin estetik yüzü olan şeffaf plakların ortodonti bilim dalının önemli bir aygıtı haline gelmesine yol açmıştır.

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