

TESSIER NO.30 YARIĞI: OLGU BİLDİRİMİ VE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ

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ÖZET

Alt dudak ve mandibulanın orta hat yarıkları nadir kraniofasiyal yarıklardandır. Alt dudak median yarığı ilk kez 1819'da Couranne tarafından tarif edilmiş ve Tessier alt dudağın median yarığını içeren yarıkları "No.30 cleft" grubu olarak sınıflandırmıştır. Literatürde bugüne kadar yaklaşık 66 adet alt dudakta median yarık içeren olgu bildirilmiştir. Tessier No.30 yarığı tanısı alan olgumuzda; alt dudakta orta hatta tam olmayan yarık, dilaltı anormal frenulum, mandibulada yarık, sternumda bifid görünüm, presternal skin tag ve kalpte ventriküler septal defekt (VSD) mevcuttu. Operasyonda dilaltı anormal frenulum Z plasti ile açıldıktan sonra alt dudak yarığı basit V eksizyon sonrası 3 tabaka halinde (mukaza, kas, cilt) sütüre edilerek kapatıldı. Mandibular segmentlere kemik osteotomi ile kenarları tazelenip interosseöz paslanmaz çelik tel ile osteosentez yapıldı. İlk operasyondan yaklaşık 3 ay sonra fizik muayenede kaynamanın tam olduğu gözlenerek mandibular gelişimi önlememesi açısından çelik tel tespiti çıkarıldı. Oldukça nadir görülen Tessier No.30 yarığı vakasında bizim uyguladığımız tedavi protokolü şu ana kadar uygulanmış olanlarla karşılaştırıldı ve literatürdeki diğer olgular gözden geçirildi.

Anahtar Kelimeler: Tessier No.30, Orta hat yarığı, Alt dudak.

GİRİŞ

Alt dudak ve mandibulanın median yarığı nadir kraniofasiyal yarıklardandır. Couranne 1819'da ilk olarak bu yarığı tanımlamıştır¹. Tessier alt dudağın orta hat yarıklarını içeren yarıkları "No.30 cleft" grubu olarak sınıflandırmıştır². Fujino ve arkadaşları 1970'de o güne kadar yayınlanmış 34 olguya kendi 5 olgularını da ilave ederek yayınlamışlardır³. 1984'de yayınlanmış olgu sayısı 58'e çıkmıştır⁴. Dünya literatüründe şimdiye kadar yayınlanmış olgu sayısı 66'dır⁵. Ancak gözden kaçmış veya bildirilmemiş olguların da olma olasılığı yüksektir.

Bugüne kadar yayınlanmış yüzün alt yarısını içeren orta hat yarıkları, alt dudakta küçük bir yarık olması⁶ ile, hyoid kemik, tiroid kartilajlar ve sternum manubriumun yokluğu ile beraber alt dudak ve mandibulanın tam yarıklı olması arasında değişen varyasyonlar gösterir^{7,8}. Ancak

SUMMARY

Tessier No.30 Cleft: Report of new case and review of the literature.

Median clefts of the lower lip and mandible are rare craniofacial clefts. Couranne in 1819 was the first to describe the condition. The midline cleft of the lower lip was classified by Tessier as a type 30 craniofacial cleft. More recently the total number of reported case has increased to about 66 in the world literature. A new case is presented here. In the our Tessier No. 30 cleft case, a midline incomplete cleft in the lower lip, sublingual abnormal fraenum, complete cleft in the mandible, a bifid state in the sternum, presternal skin tag and a ventricular septal defect in the heart was present. At operation, first Z-plasty of the lingual fraenum released the normal-sized tongue. The lip cleft was corrected by a simple V excision followed by a closure in three layers. The mandibular segments were "vitalised" with a bone rongeur and immobilised in the predetermined position with the interosseous stainless steel wire. Seeing that the bone fusion was full the stainless steel wire was taken out after three months so that it wouldn't prevent the mandibular development. Our and other treatment modalities are discussed.

Key Words: Tessier No.30, Median cleft, Lower lip.

bu olguların çoğu sadece alt dudak ve mandibulada yarık içerir. Geri kalanlarda dilde yarık, ankiloglossi, oligodonti, kalp anomalileri, sternum ve ekstremitelerde malformasyonlar görülebilir. Şu ana kadar yayınlanmış olgularda birlikte bulunan anomaliler; konjenital kalp deformiteleri⁹⁻¹⁴, yarık damak^{3,4,9,11,16}, fasiyal anomaliler (submental epidermoid kist^{15,17}, hemifasiyal mikrosomia¹⁸, Pierre Robin anomalisi⁴, göz ve kulak deformiteleri^{3,11,13,14,18}, el anomalileri^{9,19} (club foot, ektraktilli) ve kromozomal anomalilerdir^{9,20}.

Etyolojik açıdan bakıldığında alt dudağın median yarığı 1. Brankial ark alt bölümünün füzyonunda oluşan bozukluk sonucu oluştuğu bildirilmiştir (Monroe²¹, 1966 and Grabb et al.²², 1971). Son olarak 1966'da Oostrom ve arkadaşları alt dudak ve mandibulanın orta hat yarık etyolojisini embriyolojik açıdan değerlendirmişlerdir²³.

Otörlere göre erken embriyonik dönemde bir çift brankial ark yerine sadece bir brankial ark gelişir ve bu brankial ark içinde median bir olukla ayrılmış iki mandibular çıkıntı dışı doğru büyür. Bu çıkıntılar tamamen birbirinden ayrı durmadıklarından geç embriyonik dönemde (7. haftadan sonra veya baş-kuyruk arası 17-60 mm arası olduğu dönem) bunların arasında füzyon ve mezodermal penetrasyon görülmez aradaki oluk kaybolarak kaynaşırlar. Erken embriyonik dönem esnasında bu mandibular çıkıntıların hipoplazisi, geç embriyonik döneme göre daha şiddetli alt dudak ve mandibula yarığına yol açar. Geç embriyonik dönemde kaynaşmada oluşan herhangi problem sadece alt dudakta inkomplet ve hafif kleflerin oluşumuna yol açar.

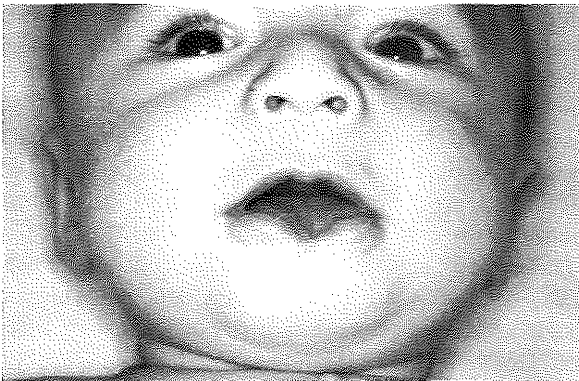
Alt dudakta median yarık vakalarının nadir görülmesi ve klinik görünümününin değişken oluşu nedeniyle yarığın cerrahi tedavi zamanı ve yöntemi hakkında tam bir görüş birliği yoktur^{7,8}. Makalenin amacı nadir görülen bu yarık için yeni bir olguyu tanımlamak ve şimdiye kadar uygulanmış tedavi yöntemlerini tartışmaktır.

OLGU BİLDİRİMİ

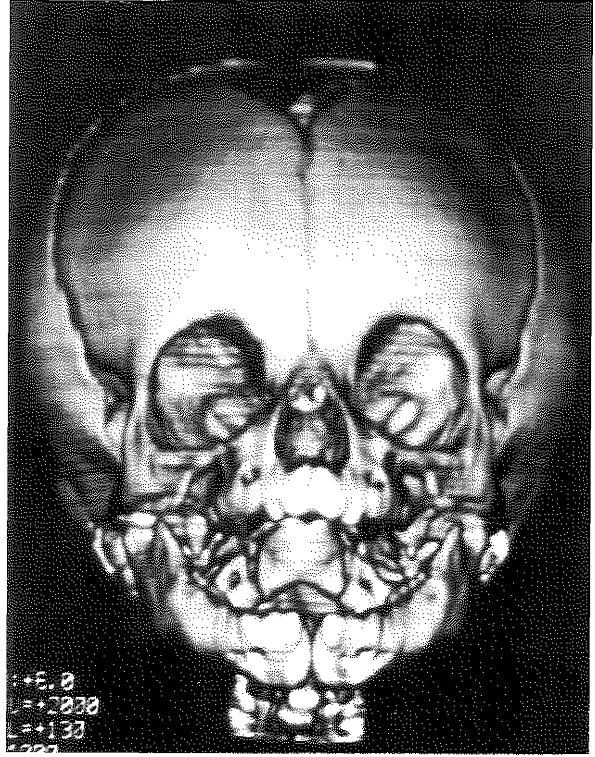
F.Ö., 10 aylık erkek bebek alt dudakta yarık olması şikayeti ile kliniğimize başvurdu. Hikayede 38 haftalık normal bir gebelik sonrası, normal vajinal yolla ailenin ikinci çocuğu olarak 3300 gram ağırlığında doğmuştu. Annenin gebeliği esnasında herhangi ilaç kullanımı, radyasyona maruz kalma ve gebeliği ile ilgili başka bir problem oluşmamıştı. Akraba evliliği ve ailede herhangi konjenital malformasyon hikayesi yoktu. Hastanın fizik muayenesi şu bulgular hariç normaldi;

1. Alt dudakta alt dudağın yaklaşık 1/3'ü genişliğinde ve 15 mm vertikal yükseklikte tam olmayan orta hat yarığı mevcuttu (Şekil 1).

2. İntrooral palpasyonda mandibula orta kısmında defekt vardı ve her iki mandibula segmenti birbirinden bağımsız olarak hareket edebiliyordu. Tomografik inceleme ile de mevcut defekt ortaya koyuldu (Şekil 2).



Şekil 1: Olgunun preoperatif görünümü.



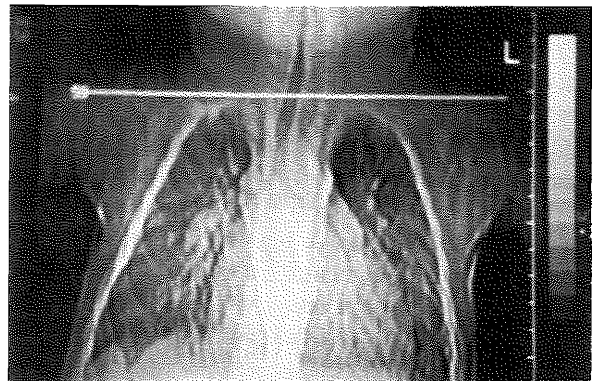
Şekil 2: Olgunun 3 boyutlu kraniyofasiyal tomografik görünümü.

Hastanın beslenme ve solunumunda herhangi problem yoktu.

3. Sternum üzerinde skin tag ve yaklaşık 20 mm'lik subkutan nodül mevcuttu.

4. Dil ucunda minimal sulkus, dil ucundan alt dudak mukozasına uzanan dil hareketlerini kısıtlayan frenulum benzeri band mevcuttu.

5. Ekokardiyografik incelemede perimembranöz VSD, pulmoner akım artışı, minimal mitral yetmezlik mevcuttu. Kardiyomegali de olan hastada sol ventrikül fonksiyonları iyi olarak bulundu (Şekil 3).



Şekil 3: VSD'ye bağlı kardiyomegalinin röntgenografik görünümü.



Şekil 4: Olgunun postoperatif 4. aydaki görünümü.

Operasyonda dilalti anormal frenulum Z plasti ile açıldıktan sonra alt dudak yarığı basit V eksizyon sonrası 3 tabaka halinde (mukaza, kas, cilt) sütüre edilerek kapatıldı. Mandibular segmentler kemik osteotom ile kenarları tazelenip interosseöz paslanmaz çelik tel ile immobilize edildi (Şekil 4). İlk operasyondan 3 ay sonra fizik muayenede kaynamanın tam olduğu gözlenerek mandibular gelişimi önlememesi açısından çelik tel tespiti çıkarıldı.

TARTIŞMA

Tessier No.30 yarığı nadir görülmesi ve yarığın şiddetindeki varyasyonlar nedeniyle cerrahi tedavinin zamanı ve yöntemi hakkında kesin bir görüş birliği yoktur. Küçük yarıklar, yarık kenarlarının V eksizyonunu takiben direkt kapatılması ile, eğer boyuna kadar uzanan yarık varsa işleme Z plastilerin ilavesi ile kapatılır⁹. Dudaktaki yarık ve ankiloglossi, konuşma ve emme gibi fonksiyonları etkilememesi açısından en kısa zamanda düzeltilmelidir.

Mandibular defektin kapatılmasının zamanı ve yöntemi hakkında hala tartışmalar devam etmektedir. Millard ve arkadaşları 6 aylıkken alt dudaktaki median yarığın, 8 yaşında da mandibular yarığın kapatılmasını önermişlerdir^{24,25}. Ancak Sherman ve Goulin 20 aylık bebekte tek evreli dudak ve mandibulanın onarımı ile ankiloglossi düzeltilmesinin estetik ve fonksiyon açısından problemsiz olduğunu bildirmişlerdir¹⁰. Mandibulanın birbirinden çok ayrı olduğu vakalarda defekt kemik grefti ile genellikle düzeltilmiştir²⁴. Birçok otör mandibula defektinin onarımı konusunda diş köklerinin hasar görmemesi açısından 10 yaş civarını beklemeyi önermiştir. Bizim vakada hem dudak hem mandibula için nispeten erken cerrahi tedavi uygulanmıştır. Biz de mandibula alt kısmında dikkatlice yapılan osteosentezin diş köklerine zarar vermeyeceğini düşünüyoruz²³. Yine bu zamanlamada yarığın büyüklüğünün de etkili olduğunu düşünüyoruz. Çünkü yarığın çok geniş olduğu vakalarda primer osteosentez

erken devrede yapılamayabilir. Bizim vakamızda mandibular yarık yaklaşık 5 milimetre genişlikteydi ve yarığın dar olması sebebiyle rahatlıkla karşı karşıya getirilip tel ile osteosentez yapılabilirdi. Biz dar ve rahatlıkla karşı karşıya getirilebilen yarıklarda hasta görülür görülmez erken dönemde tel ile osteosentez yapılmasından yanayız. Plak-vida kullanılarak yapılan tespitlerde diş köklerinin zarar görme ihtimali daha yüksektir. Tel ile tespit yapıldıktan sonra 3 ila 6 ay içinde mandibular gelişimi olumsuz yönde etkileyeceğini düşünerek tel tespitin çıkartılması gerekir. Geniş defektlerde hastanın beslenme ve nefes alma problemi varsa kemik segmentler kemik grefti veya rekonstrüksiyon plağı ile erken dönemde stabil hale getirilmelidir. Eğer böyle bir problem yoksa yumuşak doku yarık ve yapışıklıkları erken dönemde düzeltilip mandibula defekti yaklaşık 10 yaş civarında kemik grefti ile kapatılmalıdır. Bizim hastamızın geç dönemdeki dental oklüzyonu ve diş durumu ortodontistler ile birlikte takip edilerek erken osteosentezin diş ve mandibula gelişimine etkisi izlenecektir. Daha önce yayınlanmış 66 olgudan sadece 7 sinde konjenital kalp anomalisi mevcuttu^{9-14,23}. Olgumuzda VSD'ye bağlı kardiyomegali mevcuttu ancak sol ventrikül fonksiyonları iyi olduğu için hasta dijitalize edilerek takibe alındı.

Etiyolojik açıdan bakıldığında eğer Oostrom ve arkadaşlarının teklif ettikleri hipotez doğru ise vakadaki yarığa yol açan durum erken embriyonik dönem denen intrauterin 7. haftadan önceki dönemde cereyan ettirir.

Sonuç olarak Tessier No. 30 yarığı vakalarında belirlenmiş bir tedavi protokolü yoktur ve hastanın durumuna göre bu protokol cerrah tarafından belirlenmelidir. Ancak bize göre yarığın dar olduğu vakalarda deformiteler tek seansta hastanın durumu operasyona imkan verdiği en erken zamanda düzeltilmelidir.

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The preconditioned TRAM flap: preliminary clinical experience.

Restifo RJ, Thomson JG

Ann Plast Surg 1998 Oct;41(4):343-7

The single-pedicled transverse rectus abdominis musculocutaneous (TRAM) flap is prone to partial flap loss and fat necrosis, especially in high-risk groups such as patients who smoke, irradiated patients, and obese patients. Possible methods to increase the reliability of the TRAM flap include the free TRAM, the double-pedicled TRAM, and the surgically delayed TRAM. When we traveled overseas to an underserved area we were largely unable to implement these options due to limitations in equipment, supplies, and the length of our trip. We encountered a combined fat necrosis and partial flap failure rate of 27% (3 of 11 patients) in a group of heavily irradiated patients. On subsequent trips we employed a technique of acute ischemic preconditioning of the TRAM flap in 5 high-risk patients and 1 low-risk patient with good results. Although this preliminary experience is too small to draw conclusions about clinical efficacy, it does demonstrate the feasibility of performing ischemic preconditioning in a musculocutaneous flap in a clinical situation.

Capsular calcification associated with silicone breast implants: incidence, determinants, and characterization.

Peters W, Pritzker K, Smith D, Fornasier V, Holmyard D, Lugowski S, Kamel M, Visram F

Ann Plast Surg 1998 Oct;41(4):348-60

Capsular calcification was present clinically in 64 of 404 silicone gel breast implant capsules (15.8%) analyzed from 1981 to 1996. It presented as white-gray plaques on the inner surface of capsules in 62 of 64 capsules, and as massive heterotopic ossification in 2 capsules. Chi-squared analysis confirmed that calcification was related to the generation of the implant (i.e., year of manufacture; $p < 0.001$). All 28 first-generation implants (1963-1972, with Dacron patches) were clinically intact and all demonstrated extensive calcification. Their mean duration in situ was 17.6 years (range, 14-28 years). Thirty-four of the 348 second-generation implants (9.8%; 1973-1987) were associated with capsular calcification. Their mean duration in situ was 16.0 years (range, 13-22 years). Because all first-generation im-

plants demonstrated calcification, they were compared with the second-generation implants that had been in place for the same duration (>14 years). Only 42% of these 81 second-generation implants demonstrated calcification, compared with 100% of the first-generation implants ($p < 0.001$). Thus, thicker first-generation implants with Dacron patches are more likely to calcify and the effect is not entirely due to their longevity. None of the 28 third-generation implants (1987-1991) demonstrated calcification. Their mean duration in situ was 4.2 years (range, 2-7 years). For second-generation implants, calcification was related to duration in situ ($p < 0.001$). None of the 294 implants in place for less than 11 years were associated with significant clinical calcification. The percentages of capsules with calcification were 13 to 14 years, 33%; 15 to 16 years, 45%; and 17 to 22 years, 57%. Calcification with second-generation implants was not associated with patches on the envelopes. Of the 34 second-generation implants with calcification, only two had patches (composed of silicone, not Dacron). Among second-generation implants, calcification was related to implant integrity. Of implants in place for more than 12 years, 52.5% of those implants that were ruptured showed calcification, but only 10.0% of intact implants demonstrated calcification ($p < 0.001$). Seventeen of the 64 calcified capsules were examined histologically. In all of these specimens, calcification existed in two forms: globular aggregates on the surface of the capsule (adjacent to the implant) and actual bone formation within the fibrous tissue of the capsule. All calcified capsules demonstrated both globular aggregates and true bone formation regardless of the implant generation, duration in situ, or integrity. Ultrastructural analysis was performed on four capsules from 2 women who had received first-generation Dow Corning gel implants 24 and 28 years previously, and on 2 capsules from one woman who had received Heyer-Schulte gel implants 21 years previously. These capsules were analyzed according to distribution, density, mineral nature, crystal phases, and elements within crystals by electron microscopy, energy-dispersive X-ray spectrometry, and electron diffraction. These analyses confirmed two types of calcification, each with hydroxyapatite crystals. In areas of heterotopic bone, crystals 40×10 nm were deposited in an orderly fashion on collagen fibers. In contrast, in areas of globular aggregates, spherulitic aggregates of much larger crystals were present, without any relationship to the collagen. Titanium was demonstrated in capsules of first-generation implants at areas of at-

tachment of the Dacron patches. The calcification associated with saline implants revealed only one form of crystal: agglomerates, which were adherent to the elastomeric shell of the implants. A hypothesis is presented to explain the differences in calcification deposition properties between silicone gel-filled and saline-filled breast implants.

Effects of fiber type on ischemia-reperfusion injury in mouse skeletal muscle.

Woitaska MD, McCarter RJ

(Plast Reconstr Surg 1998 Nov;102(6):2052-63)

Tourniquets frequently used during surgery involve tissue ischemia followed by postoperative reperfusion. However, little information is available on the functional consequences of this procedure in skeletal muscle. The goal of this study was to use skeletal muscles of C57BL/6 adult male mice to assess functional, structural, and biochemical characteristics after hindlimb vessel occlusion. Experimental manipulation involved application of a tourniquet to the hindlimb for a 3-hour period ($n = 65$). Muscles were then excised after various periods of reperfusion. Soleus and extensor digitorum longus muscles were chosen as representative of slow oxidative and fast glycolytic muscle fiber types, respectively. The most striking functional change found after ischemia-reperfusion injury was markedly improved endurance of extensor digitorum longus muscles. These fast-twitch glycolytic muscle fibers became much more resistant to fatigue during recovery from ischemia-reperfusion injury. There was a progressive increase in force generation in both muscles during recovery; however, soleus muscles recovered function more quickly after ischemia-reperfusion than extensor digitorum longus muscles. Also, extensor digitorum longus muscles recovered mass more slowly than soleus muscles at 7 and 14 days after ischemia. Structurally, extensor digitorum longus muscles had more severely damaged mitochondria, sarcoplasmic reticulum, and myofibrils. Surprisingly, no differences in oxidative enzyme activity (citrate synthase) and oxidative damage (in protein and lipids) were found after ischemia-reperfusion. The results indicate that muscle fiber type has a significant impact on the nature of ischemia-reperfusion injury in skeletal muscle. Thus, muscle fiber composition would be expected to affect recovery from the clinical use of tourniquets and other ischemic procedures. Furthermore, the results suggest that damage to structures involved in energy transduction and excitation-contraction coupling may play a role in the effects.

The pinwheel technique: an adjunct to the periareolar approach in gynecomastia resection.

Chiu DT, Siegel HW

(Ann Plast Surg 1999 May;42(5):465-9)

The most common surgical approach to gynecomastia is through Webster's intra-areolar incision. The authors have modified the incisional phase of the operation to facilitate the delivery of a large mass of breast tissue through a relatively small incision. The essential features of this procedure are (1) delineation of the perimeter of the breast on the pectoral fascia; (2) elevation of the anterior chest wall skin and subcutaneous tissues over the entire breast mass; (3) serial application of Kocher clamps at the perimeter of the breast and, with gentle traction, sequential lysis of the peripheral and posterior attachments of the breast mass; and (4) delivery of the mass simultaneously through the periareolar incision, as the dissection proceeds, until the entire specimen is exteriorized. The specimen then consists of the entire breast mass encircled by a pinwheel-like arrangement of Kocher clamps. Thirty-one patients (61 gynecomastic breasts) were operated using this method. En bloc tissue specimens weighing as much as 285 g were removed without the need for dividing the specimen or extending the single incision. The authors recommend this technique, which is straightforward and efficacious with minimal blood loss and good postoperative cosmesis.

Gene expression of insulin-like growth factors I and II in rat membranous osteotomy healing.

Steinbrech DS, Mehrara BJ, Rowe NM, Dudziak ME, Saadeh PB, Gittes GK, Longaker MT

(Ann Plast Surg 1999 May;42(5):481-7)

Poorly healing mandibular osteotomies can be a difficult problem in reconstructive surgery. Many therapies have been attempted to augment the healing of mandibular fractures, defects, or osteotomies, but these methods have substantial drawbacks or have been ineffective. The difficulty in treating poorly healing bony defects has led to the exploration of gene therapy as a possible approach to supplement or accelerate mandibular fracture healing. To understand at what point the introduction of a suitable gene candidate might be of benefit in mandibular healing, it is imperative to examine the temporal expression of bone growth factors in a model of membranous bone healing. Insulinlike growth factors (IGFs) I and II are two such bone growth factor candidates because of their known potent *in vitro* as well as *in vivo*

effects on bone formation. In this study the authors demonstrate the temporal pattern of IGF I and IGF II gene expression during mandibular osteotomy healing using a rat model. Their data reveal that IGF I and IGF II were elevated 7 days after a mandibular osteotomy that was held in external fixation. The upregulation of IGF I and IGF II during mandibular bone healing underscores the importance of these growth factors in bone repair. Gene therapy utilizing recombinant viral constructs containing IGFs I and II may be of benefit during mandibular bone healing in an effort to augment clinical scenarios of poor or retarded bony repair.

Early cellular response in tendon injury: the effect of loading.

Iwuagwu FC, McGrouther DA

(Plast Reconstr Surg 1998 Nov;102(6):2064-71)

The effect of loading on the early cellular response to tendon injury was studied in a partial tenotomy (window) model in the extensor digitorum longus of the rat. Normal use of the limb was allowed, such that tendons were either loaded (group 1) or unloaded (group 2) when a distal tenotomy was performed. Thirty-four male Fischer rats were used. The tendons were harvested at intervals of 6 hours and 1, 3, 5, and 7 days. Quantitative cell counts were performed on light microscopic cross-sections of the window and tendon substance together with recording of cell orientation. Matrix changes in the tendon, window, and tendon-window junction were observed on transmission electron microscopy. There was a rapid and extensive change in the tendon structure with rapid loss of definition of the window edge, and an increase in cellularity of the tendon substance. The loaded tendons demonstrated less cellularity at 5 days (window cell density 3.48 ± 0.49 cells per 0.01 mm^2) with better longitudinal orientation of cells and matrix than the unloaded tendons (8.38 ± 1.1 cells per 0.01 mm^2). The numbers of inflammatory cells in both groups were roughly comparable (5 days: loaded 0.411 ± 0.071 cells per 0.01 mm^2 ; unloaded 0.554 ± 0.11 cells per 0.01 mm^2), but the unloaded windows had more fibroblasts at 5-day and 7-day stages (5 days: loaded 3.08 ± 0.44 cells per 0.01 mm^2 ; unloaded 7.82 ± 1.0 cells per 0.01 mm^2 ; $p < 0.016$). Cell counts in the tendon substance were also higher in the unloaded (3.99 ± 0.44 cells per 0.01 mm^2) than the loaded (1.95 ± 0.45 cells per 0.01 mm^2) tendons at 5 days. This study demonstrated that the cellular response after injury in this extensor tendon model is affected by tensile loading, there being increased cell numbers in both the window and tendon substance in the unloaded tendon.

Effects of topical nitroglycerin and flurbiprofen in the rat comb burn model.

Gorman PJ, Siggers G, Ehrlich P, Mackay DR, Graham WP
(Ann Plast Surg 1999 May;42(5):529-32)

Burn injury is known to cause thrombosis and occlusion of dermal vessels that come in direct contact with thermal energy. Progressive ischemia secondary to diminished blood flow may compromise dermal tissues immediately surrounding the primary burn site. A standardized brass bar was used to create uniform full-thickness "comb" burns on 10 rat backs. Topical petrolatum (N = 2), 2% nitroglycerin (N = 4), and 5% flurbiprofen (N = 4) was applied to the burns at 2 and 4 hours postinjury. The vascular patency of dermal vessels was visualized directly by latex vascular casts made 24 hours after the burn injury. The vascular casts showed an absence of patent vessels within the direct burn sites in all treatment groups, and within the burn interspaces of the petrolatum-treated rats. Interspatial dermal vessel patency was seen in the 2% nitroglycerin and 5% flurbiprofen-treated rats. Topical 2% nitroglycerin and 5% flurbiprofen applied 2 and 4 hours postinjury effectively prevented interspatial dermal vessel thrombosis at 24 hours postinjury.

Long-term observation of the effect of peripheral nerve injury in neonatal and young rats.

Watanabe O, Mackinnon SE, Tarasidis G, Hunter DA, Ball DJ

(Plast Reconstr Surg 1998 Nov;102(6):2072-81; discussion 2082-4)

The purpose of this study was to observe functional recovery and motoneuron death after nerve transection-and-repair in neonatal versus young animals. One hundred nine Lewis rats underwent posterior tibial nerve transection-and-repair at 6 or 22 days of age. Fifty-two and fifty-seven nerves at the 6- and 22-day times were used for endpoint analysis at 1, 3, 10, and 14 months. These assessments included serial functional walking track analysis, electrophysiologic studies, muscle mass evaluation, motoneuron counts with retrograde horseradish peroxidase tracing, and histologic and morphometric nerve analysis. Walking track analysis and nerve conduction velocity indicated significantly poorer functional regeneration in the 6-day-old group than in the 22-day-old group. Muscle mass in the 6-day-old group did not recover as well as in the 22-day-old group. Motoneuron numbers stained with horseradish peroxidase were less in the 6-day-old group than in the 22-day-old group. In contrast, morphometric analysis did not reach significance. This study suggests that the same nerve

injury sustained in a neonatal rat is less likely to demonstrate functional recovery than one sustained in a young rat.

A comparison of gradual distraction techniques for modification of the midface in growing sheep.

Haluck RS, Mackay DR, Gorman PJ, Siggers GC, Manders EK
(Ann Plast Surg 1999 May;42(5):476-80)

The authors carried out experiments to advance the midface in growing sheep using a distraction force across the zygomaticomaxillary sutures. They wished to assess the possibility of performing distraction osteogenesis across intact sutures as well as distraction after Le Fort osteotomies. Their results demonstrate that the technique of gradual distraction after osteotomy is successful in the growing animal. Bilateral distraction across intact sutures did not advance the midface or change the dental relationship. Unilateral distraction was successful in angulating the midface away from the distracting force in the intact growing animal. Alternating unilateral distraction or "waltzing" was surprisingly effective in advancing the midface in one of the animals studied and may become applicable in some craniofacial deformities. In all intact animals there was some expansion of the zygomaticomaxillary suture as well as a substantial migration of the distraction devices through the bone.

Microsurgical replantation of an ear in a child without venous repair.

Concannon MJ, Puckett CL
(Plast Reconstr Surg 1998 Nov;102(6):2088-93; discussion 2094-6)

Ear amputation can leave a devastating deformity; the application of microsurgical replantation techniques has allowed very favorable aesthetic outcomes when successful. We report a case of ear replantation in a child in whom a venous repair was not performed; instead medicinal leeches were used to decompress the ear in the immediate postoperative setting. This represents the third reported case of successful ear replantation without microsurgical venous anastomosis. A review of the literature reveals the high incidence of venous congestion requiring external decompression (57 percent) and the very high rate of salvage (80 percent) after replantation. Surgeons attempting ear replantation should be aware of the high rate of ear survival in the situation of no venous outflow (with appropriate decompression techniques) and should not abandon attempts at replantation because of the inability to establish venous outflow microsurgically.

The efficacy of single-stage surgical management of multiple pressure sores in spinal cord-injured patients.

Rubayi S, Burnett CC
(Ann Plast Surg 1999 May;42(5):533-9)

The practice of multiple-stage management in the treatment of patients with multiple pressure ulcers has long represented the standard of care in many specialty centers. The authors have observed that an aggressive surgical approach has proved necessary for control of this devastating problem in these patients. Their experience with one-stage reconstruction of multiple pressure sores over a 10-year period (between 1986 and 1996) in 120 spinal cord-injured patients has revealed certain advantages of this comprehensive method of surgical management. Although cumulative operating time and intraoperative blood loss were somewhat increased, the number of anesthetic episodes and the hospital stay were less than that seen in patients managed in multiple stages. Accordingly, rehabilitation and societal reintegration can be initiated earlier, and overall hospital cost may be better contained.

Modified bilateral advancement flap: the slide-in flap.

Akan IM, Ulusoy MG, Bilen BT, Kapucu MR
(Ann Plast Surg 1999 May;42(5):545-8)

The bilateral V-Y advancement flaps are used commonly in the closure of circular skin defects. We modified the standard bilateral V-Y advancement flap technique to reduce the tension along the closure, and used it in 10 patients between 1995 and 1997. In the presence of a circular defect, bilateral V-Y advancement flaps were marked on the skin, with the height of the V flaps measuring 1.5 to 2 times the diameter of the defect. The limbs of the V were not drawn as straight lines, but were curved outward slightly, making the flap and its two extensions broader than the standard V-Y flap. The broad extensions of the V flaps encircled the defect from above and below. Skin incisions were made vertically down to the muscle fascia. Additional undermining was carried out to elevate the upper and lower extensions of the V flaps for a distance that equaled the radius of the defect. The upper and lower extensions of the V flap on one side were transposed into the defect and sutured to the concave base of the opposing flap V flap at its midpoint. These extensions were then sutured to each other. The extensions of the opposing V flap were then transposed into the defect; the upper being superior and the lower being inferior to the extensions of the first flap. The rest of the operation was completed by advancement of the V flaps and closure in a Y configuration.

The efficient redistribution of available tissue by the combined use of transposition and advancement principles resulted in the repair of relatively large skin defects with reduced tension along the closure. Satisfactory results were obtained in all patients in this series without any surgical complication.

Rapid three-dimensional measuring system for facial surface structure.

Yamada T, Sugahara T, Mori Y, Sakuda M
(*Plast Reconstr Surg* 1998 Nov;102(6):2108-13)

A noncontact three-dimensional measuring system (liquid crystal range finder system) is described. Three-dimensional facial surface data (more than 30,000 points) could be obtained in 1 second, and the resolution was approximately 0.4 mm. The reliability and repeatability of the results were validated with a calibrating apparatus and a highly accurate contact-type three-dimensional digitizer. Consequently, the average of the measurement errors on a facial plaster model was 0.3 mm. Repeatability in measuring human faces was approximately 0.3 mm. Therefore, the total error in measuring human faces was approximately 0.5 mm. Because of the shortness of measuring time, this system was capable of scanning faces of infants without the need for sedation. The output of the liquid crystal range finder was demonstrated on an infant with cleft lip. The surface points improved by cheiloplasty, and the residual deformities were observed clearly. This system was thought to be the most suitable apparatus for measuring faces of infants (especially infants with cleft lip) and enabled us to analyze facial surface structure both qualitatively and quantitatively.

Pharyngeal flap for velopharyngeal incompetence in patients with myotonic dystrophy.

Amir A, Wolf Y, Ezra Y, Shohat M, Sher C, Hauben DJ
(*Ann Plast Surg* 1999 May;42(5):549-52)

Velopharyngeal incompetence (VPI) has been associated with neuromuscular disorders. Only 4 patients with myotonic dystrophy (MD) who underwent pharyngeal flap elevation for VPI have been reported in the literature. In 3 patients, surgery preceded the diagnosis of MD. Cardiorespiratory complications characterized the postoperative period of 3 patients. The authors present 3 patients with VPI and an established diagnosis of MD (by molecular genetics) who underwent pharyngeal flap elevation. The operation resulted in a major improvement in speech in all patients, although some relapse was noted later in 1 patient. Contrary to previous reports, none had peri- or postoperative cardiorespiratory complications. MD, although an uncommon

etiologic, should be considered in cases of late-onset VPI. Owing to differences between the authors' findings and previous reports, additional studies are needed before final conclusions can be reached regarding the benefit and safety of pharyngeal flap surgery in MD patients. At present, MD should not be considered a contraindication for this procedure, although close perioperative monitoring is indicated.

Cranioplasty with neovascularized autogenous calvarial bone.

Tsukagoshi T, Satoh K, Hosaka Y
(*Plast Reconstr Surg* 1998 Nov;102(6):2114-8)

We have presented two cases of cranioplasty with neovascularized autogenous calvarial bone. A surgical procedure applying the principle of flap prefabrication has been applied to the preservation of autogenous calvarial bone obtained during external cranial decompression. The rectus abdominis muscle flap was elevated. A subcutaneous pocket was prepared for preservation of calvarial bone integrated with the rectus abdominis muscle. The outer cortex of calvarial bone was removed partially by bone chiseling. The muscle flap was attached to the bone graft by means of two holes on the bone by suture. The calvarial bone, grafted onto the rectus abdominis muscle flap, was inserted into the subcutaneous pocket. Several weeks later, the neovascularized calvarial bone flap was dissected along with inferior epigastric pedicle. Cranioplasty was performed using the bone element of the flap. Revascularization was achieved by anastomosing the inferior epigastric vessels to the temporal vessels. The postoperative films demonstrated marked radiolucency at the borders of the flap, although bone scan documented that the flap was vascularized. We speculate that the transferred bony segment was not completely vascularized.

Thrombospondin 1 and its specific cysteine-serine-valine-threonine-cysteine-glycine receptor in fetal wounds.

Roth JJ, Sung JJ, Granick MS, Solomon MP, Longaker MT, Rothman VL, Nicosia RF, Tuszynski GP
(*Ann Plast Surg* 1999 May;42(5):553-63)

Thrombospondin 1 (TSP-1), an adhesive glycoprotein, plays an important role in platelet adhesion, inflammation, cell-cell interaction, and angiogenesis. TSP-1 is expressed by endothelial cells, fibroblasts, and macrophages. The unique cysteine-serine-valine-threonine-cysteine-glycine (CSVTCG) binding domain of TSP-1 also plays an important role in cell binding and modulation of cellular processes. The purpose of this study was to evaluate histologically and quantitatively TSP-1 and