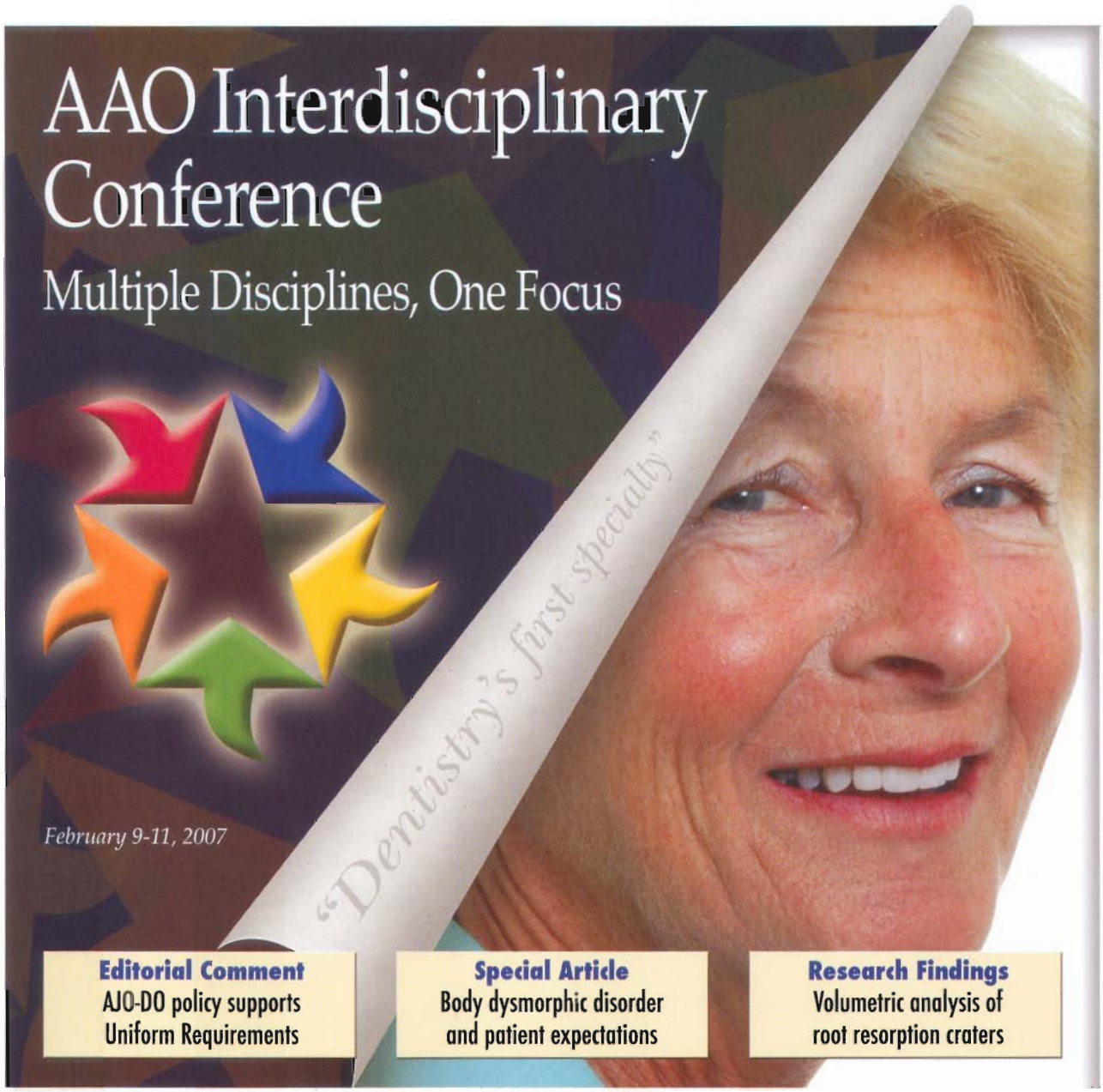
American Journal of Orthodontics & Dentofacial Orthopedics

AJO-DO

Volume 130
Number 5
November 2006

American Journal of Orthodontics
& Dentofacial Orthopedics



OFFICIAL PUBLICATION OF THE
American Association of Orthodontists, its constituent societies, the American Board of Orthodontics, and the College of Diplomates of the American Board of Orthodontics

PUBLISHED BY
Mosby, Inc.

ISSN 0889-5406

WWW.MOSBY.COM/AJODO

American Journal of Orthodontics & Dentofacial Orthopedics
Volume 130 • Number 5 • Pages 561-692
November 2006

REFERENCES

1. Graber TM, Vanarsdall RL Jr, Vig KWL. Orthodontics: current principles and techniques. 4th ed. St Louis: Elsevier Mosby; 2005.
2. Andrews LF. The six keys to normal occlusion. Am J Orthod 1972;62:296-309.
3. Lightman A. The Discoveries. New York: Pantheon Books; 2005.
4. Hayes JL. A clinical approach to identify transverse discrepancies. Presentation to the Pennsylvania Association of Orthodontists; Philadelphia; March 8, 2003.
5. Johanson D, Edgar B. From Lucy to language. New York: Simon and Schuster; 1996.
6. Lundstrom AF. Malocclusion of the teeth regarded as a problem in the connection with the apical base. Presented at the Tandlakar Einstitutet, Stockholm, October 27, 1923. Stockholm: Svensk Tandlakare Tidskrift; 1923.
7. Tatterstall I, Schwartz JH. Extinct humans. Boulder, Colo: Westview Press; 2001.
8. Price WA. Nutrition and Physical Degeneration. 16th printing. La Mesa, Calif: The Price-Pottenger Nutrition Foundation; 2004.
9. Mew JRC. The postural basis of malocclusion: a philosophical overview. Am J Orthod Dentofacial Orthop 2004;126:729-38.
10. Fidler BC, Årtun J, Joondeph DR, Little RM. Long-term stability of Angle Class II, Division1 malocclusions with successful results at end of active treatment. Am J Orthod Dentofacial Orthop 1995;107:276-85.

Authors' response

We thank Dr Hayes for his interest in our article. The evidence-based dentistry editor, Greg Huang, in his recent article "Bigfoot lives?" (Am J Orthod Dentofacial Orthop 2006;129:323-4), addressed Dr Hayes's concern that authors might select or deselect evidence according to their own biases. Because Dr Huang made his point so elegantly, suffice it to say here that we tried to be meticulous in selecting our citations by virtue of the authors' levels of scholarship, the scientific merit of the reported studies, and the baseline criterion that articles appeared in refereed journals. It is clear that Dr Hayes used another standard in selecting his references. Yes, he might one day be vindicated in his assertion that "randomized, prospective, and controlled evidence . . . could be yet to come, but that does not mean we need to wait for such research before proceeding." We have no difficulty with this empirical approach, as long as Dr Hayes realizes that there is an equal chance that further evidence will prove that his willingness today to accept that Bigfoot lives might eventually demonstrate big foot in mouth!

Marc B. Ackerman
Daniel J. Rinchuse
Donald J. Rinchuse
Philadelphia and Pittsburgh, Pa

Am J Orthod Dentofacial Orthop 2006;130:565
0889-5406/$32.00

doi:10.1016/j.ajodo.2006.09.032

Skeletal and soft-tissue response to genioplasty

The recent article on advancement genioplasty was a scholarly, well-written report of a well-controlled study and makes an excellent point (Shaughnessy S, Mobarak KA, Høgevold HE, Espeland L. Long-term skeletal and soft-tissue responses after advancement genioplasty Am J Orthod Dentofacial Orthop 2006;130:8-17). I am, however, concerned about the statement that "the use of implants, due to problems with drift and deformation, has also declined." Four articles are referenced to underline this claim, but 3 are over 30 years old, and the most recent was published in 1986. The authors also stated that "Today, the most favored approach for correction of skeletal chin deformity is the horizontal osteotomy of the inferior border of the mandible." This statement is referenced to a 1989 article. Much has changed in the field of facial implant augmentation during the last 3 decades.

When I was a resident, like most oral and maxillofacial surgeons, I learned how to perform advancement genioplasty but was told that chin implants "did not work," so we never were taught the implant technique. At that time (1983), the same negative statement was being made about dental implants. What a difference a quarter of a century makes!

Horizontal genioplasty is an excellent operation and is the only significant option for vertical lengthening of the chin or horizontal chin reduction. When compared with chin implants for routine chin augmentation, there are many drawbacks. A genioplasty requires cutting of bone and is always accompanied by increased swelling and bleeding and, frequently, extended healing. It requires a significant armamentarium, such as power saws and blades, rigid fixation plates, screws, and screw drivers. The procedure produces a significant aerosol of microdroplet blood, which frequently ends up on the surgeon's headlight, glasses, and hat. Finally, although rare, inadvertent laceration of the sublingual artery or related vessels can cause fatal or near fatal airway obstruction secondary to expanding hematoma.[1] This is not a readily reversible operation; although it could be taken down and replaced in the original position, it would take some doing and require the same hardware as to place it. Finally, the operation can take upwards of an hour to perform and close.

Chin implants, on the other hand, can be placed in as little as 15 minutes, do not require an extensive armamentarium, produce little bleeding, are easy to remove, require much less dissection, do not endanger the vasculature of the floor of the mouth, can be trimmed to customize the result, are available in many configurations, and are totally reversible.[2-4] I have placed hundreds of Gore-Tex and silastic chin implants with excellent success, and I perform this procedure with facelifts, with orthognathic procedures, and as a stand-alone procedure. Today's modern chin implants are available in a vast array of anatomic shapes and sizes, enabling the surgeon to control the result in 3 dimensions. Although I cannot quantify my experience with the same accuracy as Dr Shaughnessy's limited series, I use them weekly in my cosmetic facial practice as a mainstay.

My reputation, especially with facelifts, revolves around predictable procedures and happy patients, and, if chin implants didn't work, I would not jeopardize my outcomes or reputation. I occasionally perform sliding genioplasty with the sole indication of the need to lengthen the chin along with the advancement.

There might be a somewhat increased infection rate with chin implants compared with sliding genioplasty, but I have removed infected implants and successfully replaced them after healing.

I believe that far more chin implants are placed by multispecialty surgeons including oral and maxillofacial, ear-nose-throat, plastic, and oculoplastic surgeons, as well as dermatologists than sliding genioplasties are performed each year.

Chin implants received a bad rap largely because of past biomaterials and placement techniques. Twenty-five years ago, preformed chin-implant options were much less prevalent. Many surgeons carved implants from blocks of material such as silicone or used "homemade" materials such as Vicryl mesh. In addition, implants of Teflon and Proplast were found to be disastrous when placed in the body, especially the temporomandibular joint. Not only were some of these early implants difficult to place, but they were also troublesome to remove because tissue ingrowth made explantation traumatic.

Any facial implant can cause bone erosion; however, all chin (or other facial) implants cannot be painted with that brush. There is usually a specific reason for significant bone erosion. As Dr Shaughnessy et al pointed out, a sliding genioplasty will relapse over 8% of the advancement in successful cases. The same can probably be said about chin implants because bone, periosteum, and soft tissues are dynamic. In cases of chin implants with severe bone resorption (which I have seen from other surgeons), the main causes are usually failing to anchor the implant or placing the implant over improper bone. A mobile foreign object placed anywhere in the body, especially in an area of dynamic muscle movement, will cause erosive changes. I always anchor chin implants with a single midline fixation screw or by suturing to the mandible. In the case of a fixation screw, the implant is immobilized in the critical period when the implant is encapsulated by fibrous connective tissue. After the capsular containment is complete, those screws could probably be removed without consequence, although they are routinely left in place. In addition, by making the receptive implant dissection pocket as conservative as possible (just slightly larger than the actual implant), migration is further limited.

The other main contributing factor is subimplant osteolysis with placement over thin alveolar cortical bone instead of dense cortical bone that corresponds with menton. As all orthodontists realize, pressure and movement on thin alveolar bone will produce osteolysis. Surgeons who are not familiar with this concept might place the chin implant too superiorly and over the tooth roots of the mandibular incisors. This thin bone will erode if a mobile implant is continually moving over the surface, compounded by the perioral and cervical muscles that function continually. If the implant is positioned over the dense cortical bone and fixated securely, significant erosion is not seen.

Again, I applaud the diligent work of these authors and agree that sliding genioplasty is a predictable and viable technique for cosmetic chin advancement. I think it is equally important to clarify the misconception that chin implants have fallen out of favor or that they are not a viable treatment option for cosmetic chin augmentation.

Joseph Niamtu
Richmond, Va

Am J Orthod Dentofacial Orthop 2006;130:565-6
0889-5406/$32.00

doi:10.1016/j.ajodo.2006.09.027

REFERENCES

1. Niamtu J. Near-fatal airway obstruction after routine implant placement. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;92:597-600.
2. Niamtu J. Alloplastic chin augmentation. In: Cosmetic facial surgery. Oral and maxillofacial surgery clinics of North America. Philadelphia: WB Saunders; 2000. p. 765-9.
3. Niamtu J. The use of ePTFE implants in cosmetic facial surgery. MDEssentials.com (online). Aesthetic Med News 2000;9.
4. Niamtu J. Liposculpture and lower facial rejuvenation. Plast Surg Prod 2000:28-32.

Authors' response

We want to thank Dr Niamtu for his valuable comments. We acknowledge that much has changed in the field of facial implant augmentation during recent years and that good results are now routinely achieved.[1]

As Dr Niamtu points out, chin implants have advantages over advancement osteotomy, including less swelling and bleeding, a smaller armamentarium, and less time. Advancement genioplasty, on the other hand, is a well-established and versatile procedure that routinely produces excellent results. It allows 3-dimensional control of chin position and in certain instances produces clinical results that are difficult to achieve with chin implants. Reduction of chin height combined with advancement is an example. Also, an asymmetric genioplasty can be easier to correct with an osteotomy than with contouring of implants.

Postoperative infections, both acute and chronic, have been described after facial implants.[2] With the osteotomy method, antibiotic administration will almost always lead to survival of the advancement segment. An infected implant, on the other hand, must almost always be removed.

The misconception that chin implants are unsuccessful can probably be attributed to bad experiences with past biomaterials and placement techniques and also to the lack of controlled studies in more recent literature. In several available reports, follow-up times were short, and careful radiographic examinations were often lacking. Some implants—eg, porous