

CONTENTS

COVER

On the cover: Clinicians frequently prescribe the use of orthodontic elastics to deliver forces that aid in tooth movement. Latex elastics are inexpensive, come in a variety of sizes and weights, and patients are generally accepting of elastic use. However, clinicians often rely on experience or habit when prescribing elastic bands because initial force delivery and degradation of the force over time are not well documented. Liu Yang and colleagues in Hangzhou, China, evaluated the force degradation of 10 different elastics over 48 hours in air, in artificial saliva, and in the mouths of volunteers. They found that, in general, forces degraded more quickly and to a greater degree in the mouth compared with more controlled environments. The smiling patient on the cover is Karsyn Ivey. She was treated orthodontically by Dr. Keith Sellers of Sellers Orthodontics, Charlotte, North Carolina.

READERS' FORUM

- The effects of botulinum injection on bone and cartilage of the mandibular condyle** 285
Jean-Daniel Kün-Darbois and Daniel Chappard, Angers, France
- Herbst appliance anchored with miniscrews: Some unsettled questions** 285
Chenghao Zhang, Chengdu, China
- Authors' response** 286
Antonio Manni, Marco Migliorati, Chiara Calzolari, and Armando Silvestrini-Biavati, Genova, Italy
- Impacted molars** 287
Patrick K. Turley, Hawthorne, Calif
- Authors' response** 287
Gerardo La Monaca, Maria Paola Cristalli, Nicola Pranno, Gabriella Galluccio, Susanna Annibali, and Roberto Pippi, Rome, Italy

ETHICS IN ORTHODONTICS

- It's a dual responsibility** 289
Peter M. Greco, Associate Editor for Ethics in Orthodontics, Philadelphia, Pa

SYSTEMATIC REVIEW



- The effect of micro-osteoperforations on the rate of orthodontic tooth movement: A systematic review and meta-analysis** 290
Saritha Sivarajan, Lorretha P. Ringgionon, Mona M. Salah Fayed, and Mang Chek Wey, Kuala Lumpur, Malaysia, and Cairo, Egypt







Video available with article online at www.ajodo.org

The American Journal of Orthodontics and Dentofacial Orthopedics (ISSN 0889-5406) is published monthly by Elsevier Inc., 230 Park Avenue, Suite 800, New York, NY 10169. Periodicals postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Elsevier, Journal Returns, 1799 Highway 50 East, Linn, MO 65051.

CONTENTS *continued*

ORIGINAL ARTICLES

-  **Cervical vertebral maturation: Are postpubertal stages attained in all subjects?** 305
Giuseppe Perinetti, Camilla Braga, Luca Contardo, and Jasmina Primožic, Nocciano (PE) and Trieste, Italy, and Ljubljana, Slovenia
-  **Force degradation of orthodontic latex elastics analyzed in vivo and in vitro** 313
Liu Yang, Chenxing Lv, Fan Yan, and Jianying Feng, Hangzhou, China
- Impact of passive self-ligation and conventional elastic ligation on orthodontic force in the simulation of a mandibular lateral incisor linguoversion** 320
Keisuke Tochigi, Naomi Saze, and Kazuhito Arai, Tokyo, Japan
- Effects of Twin-block vs sagittal-guidance Twin-block appliance on alveolar bone around mandibular incisors in growing patients with Class II Division 1 malocclusion** 329
Chun-xi Zhang, Gang Shen, Yu-jun Ning, Hong Liu, Yi Zhao, and Dong-xu Liu, Jinan, China
- Effect of maxillary incisors, lower lip, and gingival display relationship on smile attractiveness** 340
Hande Tosun and Burçak Kaya, Ankara, Turkey
- Registration accuracy between intraoral-scanned and cone-beam computed tomography-scanned crowns in various registration methods** 348
Seung-Weon Lim, Hyeon-Shik Hwang, Il-Sik Cho, Seung-Hak Baek, and Jin-Hyoung Cho, Gwangju, Seoul, and Pohang, Korea
-  **Smile outcome comparison of Invisalign and traditional fixed-appliance treatment: A case-control study** 357
Terpsithea Christou, Roberto Abarca, Vasileios Christou, and Chung How Kau, Birmingham, Ala, and Bethlehem, Pa
- Facial growth changes in a Colombian Mestizo population: An 18-year follow-up longitudinal study using linear mixed models** 365
Iván Jiménez, Luisa Villegas, Juan Carlos Salazar-Urbe, and Luis Gonzalo Álvarez, Medellín, Colombia
-  **Effect of force direction and tooth angulation during traction of palatally impacted canines: A finite element analysis** 377
Kinan G. Zeno, Samir Mustapha, Georges Ayoub, and Joseph G. Ghafari, Beirut, Lebanon, Dearborn, Mich, and Philadelphia, Pa
- Short-term effects of fixed orthodontic appliance on concentrations of mutans streptococci and persister cells in adolescents** 385
Chelsea Ko-Adams, Iacopo Cioffi, Delphine Dufour, S. M. Hashim Nainar, Céline M. Lévesque, and Siew-Ging Gong, Toronto, Ontario, Canada

CASE REPORTS

- Orthodontic treatment for a patient with anterior open bite and severe condylar resorption** 392
Danal Moon, Jae Hyun Park, and Gye Hyeong Lee, Seoul, Suwon, Gwangju, and Yeosu, South Korea, and Mesa, Ariz

CONTENTS *continued*

- Long-term stability of a Class III malocclusion with severe anterior open bite and bilateral posterior crossbite in a hyperdivergent patient** 408
Oscar Mario Antelo, Thiago Martins Meira, Dauro Douglas Oliveira, Matheus Melo Pithon, and Orlando Motohiro Tanaka, Curitiba, Belo Horizonte, Minas Gerais, and Bahia, Brazil

INNOVATIONS AND TECHNOLOGY

- Accuracy of digital light processing printing of 3-dimensional dental models** 422
Stephen L. Sherman, Onur Kadioglu, G. Frans Currier, J. Peter Kierl, and Ji Li, Baton Rouge, La, and Oklahoma City and Edmond, Okla

LITIGATION AND LEGISLATION

- Got it** 429
Laurance Jerrold, Brooklyn, NY

STATISTICS AND RESEARCH DESIGN

- The importance of careful selection between fixed-effect and random-effects models** 432
Loukia M. Spineli and Nikolaos Pandis, Hannover, Germany, and Bern, Switzerland, and Corfu, Greece

CONTINUING EDUCATION

- Instructions** 434

DIRECTORY: AAO OFFICERS AND ORGANIZATIONS 435

READER'S SERVICE

- Information for authors—on the Internet, go to www.ajodo.org, For Authors, Author Information**
- Information for readers** 12A
- Classified ad section** 15A