Welcome to another quarterly edition of *AONA News*. This issue includes expanded clinical content submitted by members of AOVET North America. We continue to seek contributions of clinical cases from all AONA specialties. If you have an interesting case I’d encourage you to share it in *AONA News*.

Also included in this edition are several reports of activities by various AONA specialties. These highlight the dynamic nature of our organization and the commitment of our many member volunteers. We also recognize numerous Fellowship and Research Grant Awardees, along with the 2013 Kathryn Cramer Memorial Award Winner. Congratulations to all!

I look forward to your continuing member contributions for future issues of *AONA News*. Please submit your story ideas and suggestions at editor@aona.org.

David J. Hak, MD, MBA
Editor-in-Chief *AONA News*

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**Call for Clinical Content**

Have an interesting case to share? One that went well, or even one that did not go so well but illustrates an important learning point? Develop a novel approach to a difficult or common problem? Have a really unique case that no one else will ever see? If so, we’d like to feature it in future editions of *AONA News*. Not sure whether your case is what we are looking to publish? Just send us a quick note, and we’ll review it with you. Please send your cases to editor@aona.org.

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* We would like to acknowledge Dr. Brett Crist who contributed to the “Operation Enduring Freedom Patient with Subtrochanteric Fracture” case published in the February 2013 issue of *AONA News*. 
Correction of Grade IV
Medial Patella Luxations in a Dog

Marc Wosar, DVM, MSpVM, DACVS
Miami Veterinary Specialists

A 4 year old Yorkshire Terrier mix breed dog, 3.4 kg body weight, was presented for evaluation of a progressive inability to bear weight in the rear limbs. When walking, he exhibited a crouched gait, with most of his weight carried by the front limbs. On orthopedic examination, he had severe internal torsional deformity of both rear limbs with associated bilateral Medial Patella Luxations (MPL). The patellas were found medial to the medial trochlear ridge, and could not be reduced (Grade IV). Both limbs were treated identically, beginning with the left side.

Analysis of radiographs revealed a severe unifocal distal femoral varus deformity with mild external torsion, and a severe unifocal proximal tibial valgus deformity with severe internal torsion (Figure 1). Radiographs were evaluated using digital planning software to resolve the deformities. The Center of Rotation of Angulation (CORA) of the femoral and tibial deformities was calculated (1). Both deformities were almost purely in the frontal plane. The femoral deformity was 34 degrees varus. The tibial deformity was partially compensated, with a magnitude of 31 degrees valgus. These deformities were nearly equal in magnitude, and were at similar distances from the knee joint, such that the overall limb alignment appeared reasonably well compensated. However, the knee joint reference angle was deviated over 30 degrees varus with a severely malaligned quadriceps mechanism (Q-angle approximately -40 degrees) and an irreducible medial luxation of the patella (Figure 2). This pattern of changes (femoral varus with a compensatory tibial valgus and torsion) are common with this syndrome (2, 3).

Treatment goals are twofold: the realignment of the quadriceps mechanism with the skeletal system to correct the Q-angle, and placing the knee joint reference angle in an anatomic plane. In this case, this required corrective osteotomies of the femur and tibia, as well as a tibial tuberosity transposition.
To correct the deformities, closing wedge osteotomies with plate fixation (2.0 DCP) were performed (4). Goals were to correct the anatomic lateral distal femoral angle to 95 degrees, the mechanical medial proximal tibial angle to 93 degrees, and the Q-angle to between -10 and 0 degrees (normal values in the dog). In a patient this small, the laterally-based femoral and medially-based tibial wedges were quite small (5 to 6 mm) The thickness of the osteotomy kerf (saw blade thickness 0.7 mm) had to be taken into account when performing the osteotomies, with particular attention paid to where the saw kerfs met at the wedge apex (Figure 3). Since both osteotomies were placed where the bones flared in diameter, the orientation of the wedges was adjusted so that the proximal and distal cuts were as equal in length as possible. However, on reducing the osteotomy, there was still a step where the diaphyseal bone met the thicker metaphyseal bone. The plates were carefully contoured to avoid aligning the cortical surfaces under the plate and causing unwanted translation of the distal segment. Rotational deformity was corrected acutely using visual cues.

After the corrective osteotomies were completed, the knee joint angle and limb alignment were very good, but due to the magnitude of torsion of the proximal tibia, the Q-angle was still too great and the patella was not aligned with the trochlear groove (patellar surface of the femur) (5). A tibial tuberosity transposition was performed, fixed with two k-wires in a more lateral position, and the Q-angle was then straight. After release of the medial retinacular tissue, the patella would ride in its groove through full range of motion.

After 8 weeks, radiographs showed adequate healing of the osteotomies, the patella central within the femoral trochlear groove, with the implants stable (Figure 4). The patient had begun to bear the majority of his weight on that limb, so an identical surgery was then performed on the contralateral right rear limb. The patient is now able to run and jump with near-normal range of motion and function in the rear limbs.
Discussion

MPL is a common condition in dogs, and occurs occasionally in cats. Its pathogenesis is believed to stem from a spiral deformity of the rear limb, with external torsion of the distal femur, placing the trochlear groove out of alignment with the quadriceps mechanism, forcing the patella to luxate medially. Over time, the abaxial muscular pull of the quadriceps causes a progressively worsening varus deformity of the distal femur with a compensatory valgus and torsional deformity of the proximal tibia. The whole limb alignment appears to remain reasonably straight, but the knee joint angle gets progressively deviated into a very abnormal varus angulation with the quadriceps mechanism progressively incapable of extending the knee.

MPL are graded on a scale of I through IV, with a grade IV MPL being permanently luxated out of the femoral trochlear groove and impossible to reduce, even under heavy sedation/anesthesia. It is associated with knee joint rotational instability, anterior cruciate ligament tears, hyperextension of the ankle joint, and chondromalacia patellae.

This condition in dogs has many similarities to Miserable Malalignment Syndrome in humans, but generally with mirror-image deformities. However, in small animals, the severity of the long bone angulation and patella luxation, together with the difficulty of implementing a coordinated physical rehabilitation program, makes physical therapy a poor option and leads most veterinary surgeons to pursue a multiple-osteotomy approach for correction.

References

AOVETNA Selects José M. García-López as Community Development Representative

The AOVET North America (AOVETNA) Board is pleased to announce that José M. García-López has been elected AOVETNA Community Development Committee (CDC) representative. García-López has been an active faculty member of AOVETNA since 2009 and a member of the AOVET North America Education Committee since 2011.

His three-year term will commence on May 1, 2013, as his predecessor Mike Kowaleski’s term will end on April 30, 2013. The AOVETNA Board and AOVET faculty are grateful to Kowaleski for all his work with the Community Development Committee.

García-López is the Associate Professor, Large Animal Surgery at Cummings School of Veterinary Medicine at Tufts University. “As a Residency Director in our hospital, I have a special appreciation for what the AO and its courses bring to the education of our residents and clinicians,” García-López says. He believes that the AO is one of the most important organizations responsible for education and extending the limits of medical professionals. He completely understands the level of commitment necessary to meet all the roles and responsibilities that come along with his new position as the Community Development Committee representative.

García-López adds that he is excited about the prospect of helping AOVET move forward and increasing its visibility. AOVET wishes him all the best in this role.

11th Annual AOSpine North America Fellows Forum
A Huge Success

The 11th Annual AOSpine North America Fellows Forum took place on March 14 – 16, 2013 in the beautiful Fairmont Banff Springs Hotels. Drs. Tom Mroz and Paul Arnold, Co-Chairpersons for the forum, welcomed distinguished keynote speakers: Dr. David Wong from Greenwood Village, Colorado, and Dr. Jack Zigler from Plano, Texas.

The scientific program consisted of lectures, fireside case conferences, and a new optional afternoon lecture series offered this year. The highlight of the program were the presentations given by each Fellow focusing on his/her research program at their institution. Each presentation was evaluated in a peer-reviewed process by the Faculty and Fellowship Directors.

Awards of Excellences were presented to Micah Smith, MD for the best clinical research presentation, Arne Merhakens, MD for the best basic science presentation, and Tony Goldschlager, MD for the best poster presentation. Congratulations to our Award Winners as well as the rest of the Fellows for their hard work and outstanding research presentations.
AOVET North America held their annual Triple Veterinary Conferences at the Hilton Columbus at Easton Hotel on April 25 – 28, 2013. The Columbus Veterinary courses represent the longest standing AO courses on fracture repair in the veterinary field in the United States. They have been given annually in Columbus, Ohio since Drs. Hohn and Jenny first started them in 1970. Despite over 40 years of history, the Columbus Veterinary Courses are continuously evolving and striving to teach the most current trends in fracture care for both small animals and equine. The three different courses are each four days in length and focus on different subjects. The faculty for these courses practice in both North America as well as internationally in such countries as Italy, Switzerland, Australia and Ireland and are recognized leaders in small animal and equine orthopaedics. Over 215 participants came to attend these three fantastic courses in Columbus.
For the two Small Animal Courses, the Co-Chairmen were Dr. Kenneth A. Johnson, MVSc, PhD, FACVS, ACVS, ECVS and Dr. Michael P. Kowaleski, DVM, DACVS, DECVS. The Principles Course provided the participants with an understanding of bone healing and how it can be favorably influenced through internal fixation of fractures. The participants had the chance to practice various bone plating techniques in the lab with plastic bone models as well as participate in fireside discussion groups which enable them to have intimate small group discussion time with the small animal faculty. The Advanced Course expands upon the concepts presented in the Principles Course and also allows the participants time in the lab as well as small group discussion time.

The Equine Advanced Course Co-Chairmen were Dr. Lawrence R. Bramlage, DVM, MS, ACVS and Dr. Alan J. Ruggles, DVM, ACVS. The Equine Course focused on advanced techniques for reconstruction of complicated fractures requiring plating. The participants practice plating techniques in the lab on bone models and also had a chance to bring radiographs of problem cases to the course and have them discussed via a round table discussion with the faculty and other participants. A reception was held on the evening of the first day of the course for all participants to relax and have the informal opportunity to chat with the faculty.

Participants for these three courses traveled from all over the world and came from such countries as Australia, Israel, Ireland, the United Kingdom, Trinidad & Tobago, Korea, Guatemala, Switzerland, Colombia, the Netherlands, Italy, Sweden and Brazil. Congratulations to all of the Chairmen for another successful year in Columbus and we look forward to doing it again next year. Course dates will be April 10 – 13, 2014.
Cased-Based Discussion and Interactive Learning Focus of Redesigned Solutions for Problem Fractures and Post-traumatic Complications Course

AOTNA held its 2013 Solutions Course April 17 – 20, 2013 at Eden Roc, Miami Beach, FL. This year marked a new course design, reflecting changing practices and allowing increasing interaction.

The new design focused on case presentations which emphasized the core topics of the course, including difficult and complex fracture patterns, nonunions, malunions, osteotomies, infection and complex soft tissue management. In addition, two osteotomy practical learning labs were added for hands-on training.

Matt Graves, MD has attended the course several times as a participant and several times now as a faculty member.

“Each time I have learned a great deal, particularly about complex problems that do not have evidence-based answers. This is the best place to find Level 5 evidence. There is a strong commitment to understanding and respecting history and the mechanics of displacement, deformity, and construct stability,” says Dr. Graves.
High-Level Faculty Provides Collective Knowledge

When asked what makes this course unique, the surgeons agree that the experienced, world-renown faculty is something you do not find at other courses. Dr. Graves explains, “Having the opportunity to discuss failures, complications, and salvages with faculty like Drs. Jeff Mast, Keith Mayo, René Marti, and Steve Benirschke is invaluable. The collective knowledge is remarkable and the willingness to transmit this type of knowledge is nothing less than fantastic.”

Brad Yoo, MD, Solutions Course participant and AOTNA faculty member adds, “By interacting with international faculty whom I deeply respect, I learned many subtle techniques and concepts which add to my pre-existing skill set. I was comforted to see other participants struggle with the same problems I do, and I learned tremendously from the questions other participants had for our experts. I enjoyed being able to present troublesome cases to the expert panel to receive their perspective, at which point you add onto your knowledge and most importantly, are able to help your patients in a more effective way.”

Thomas Higgins, MD, AOTNA faculty comments, “I get to hear the state of the art solutions from the absolute leaders in the field. The creativity demonstrated by the faculty in the case-based discussion does not just educate me, it inspires me to design more creative solutions in my own practice.”

Active Case-Based Discussion Improves Interaction

The recent move to lecture format followed by active case discussion during this year’s course improved interactions among the participants and faculty that continues well beyond the conclusion of the course. Dr. Graves explains, “The ability to bring cases for presentation allows for immediate answers that cannot be found in a book. The relationships that develop allow for continued case discussions through e-mail or phone communications. The faculty members continue to be willing to provide instruction long past the end of the course.”

Participants who presented their troublesome cases was the most interesting aspect for Dr. Yoo. He says, “Since a peer is presenting the case, there is less reluctance for participants to give their opinion or perspective on the problem. Getting direct feedback from the expert panel was a powerful learning moment for me.”

Dr. Higgins described the course as one giant fracture rounds saying the points of education come in the setting of challenging cases, which make them relevant and memorable. He concludes, “The Solutions course is unique because it tackles the absolute toughest problems that we face in orthopedic trauma. The discussion between faculty and participants is at such a high level, I enjoyed learning ‘the best from the best,’ it is not something I have ever seen at any other meeting.”

The 2013 Solutions course successfully provided an outlet to discuss true problematic cases and difficult issues in orthopaedic trauma. The re-designed format was well-received by participants and faculty alike and set the stage for a course focused on solutions to challenging topics and interactive discussion with leading orthopaedic trauma surgeons in the future.
Surgical Repair of a Fracture of a Proximal Sesamoid Bone in a Thoroughbred Racehorse Named Talk Therapy

Patricia M. Hogan, VMD, ACVS
Hogan Equine at Fair Winds Farm

A 2-yr-old intact male Thoroughbred racehorse was referred for surgical repair of a fracture of a proximal sesamoid bone in the left forelimb. The colt had sustained the injury in a fast workout (breeze) at Belmont Park racetrack the morning prior to referral. The horse was unraced at the time of injury and was in early race training.

On presentation, the horse walked with a noticeable lameness of the left forelimb and had moderate effusion of the affected fetlock (ankle) joint. Radiographs (Figures 1 and 2) revealed a complete, displaced basilar fracture of the medial proximal sesamoid bone.

Surgery was performed the following day using a closed reduction technique under arthroscopic and radiographic guidance. The fracture was inspected arthroscopically and some minor associated fragmentation along the fracture line was removed and the area debrided down to smooth margins with a small curette. Three 19-g needles were placed intra-articularly (Figure 3) along the dorsal margin of the affected sesamoid bone to act as radiographic markers, assisting with spatial orientation of the fracture location relative to the dimensions of the bone.

The fracture was reduced using two AO bone clamps applied thru stab incisions along the proximal and distal borders of the affected bone and alignment at the joint surface was monitored arthroscopically. Once satisfactory reduction was achieved, a 4.5 mm and a 3.5 mm cortical screw were placed in parallel fashion thru a single stab incision made at the base of the sesamoid bone. The screws were directed from distal to proximal to compress the fracture.

A half-limb cast was placed on the limb for recovery from anesthesia and was subsequently removed the following day. The horse received an extended period of a graduated rest program with frequent radiographic monitoring. Race training resumed 10-months after the initial injury. The horse made an uneventful return to racing and has started in more than 20 races and amassed $221,000 since sustaining the injury. He is still competing 3-years post-injury as of this writing. Follow-up radiographs show full healing of the previous fracture with minimal arthritic response in the fetlock joint and no visible stress to either implant (Figures 4 and 5).
AOSNA Announces Fellowship Awards for the 2013/2014 Fellowship Cycle

AOSNA is pleased to announce the sites that have been awarded fellowship funding for the 2013/2014 fellowship years. There were a total of 52 applications from outstanding institutions received. All of the applications went through a peer-reviewed process to determine which sites would receive the available funding.

Congratulations to the 25 sites that were selected:

- Cleveland Clinic
- Hospital for Special Surgery
- Johns Hopkins University School of Medicine (orthopedic)
- Johns Hopkins University School of Medicine (neurosurgery)
- Massachusetts General Hospital/Brigham & Women’s Hospital
- Mayo Clinic
- McGill University Health Centre
- OrthoCarolina Spine Center
- Stanford University Medical Center
- Thomas Jefferson University (neurosurgery)
- University of Alabama at Birmingham
- University of British Columbia
- University of California, Los Angeles
- University of California, San Diego
- University of California, San Francisco
- University of Rochester
- University of Saskatchewan/Royal University Hospital
- University of Toronto/Toronto Western Hospital
- University of Utah
- University of Virginia
- University of Washington/ Harborview Medical Center
- Vanderbilt University Medical Center
- Washington University
- Weill Cornell Medical College
- West Virginia University

The AOVETNA Board is pleased to announce that Alan Ruggles has been elected AOVETNA Chair. Ruggles is a staff surgeon at Rood and Riddle Equine Hospital, Lexington, Kentucky and has been an active faculty member of AOVET North America since 1994.

Alan Ruggles has served as Chair of AOVETNA since 2010, and will continue his new term until July 31, 2016. In addition, he has been a member of the AOVET International Board since 2010.

Ruggles believes that due to the establishment of AOVET as a clinical division within AONA, the veterinary group has been able to design and implement new courses, enhance regional community development, and begin the process for fellowship and research activities.

As Chair of AOVETNA, he says, “My goals would be to maximize the support to our members for course, community development and fellowship activities. Another goal is to establish a working model for the veterinary group in the Outcome Measures Project.”

AOVET welcomes Alan Ruggles, once again, and wishes him all the best in his tenure as AOVETNA Chairperson.
AOTNA Announces Fellowship Awards for the 2013/14 Fellowship Cycle

Fellowship grant recipients for the 2013-2014 academic year have been announced.

AOTNA is grateful for the financial support from:

AOFoundation
DePuy Synthes

2013–14 Fellowship Sites:
Carolinas Medical Center
Case Western Reserve University/Metro Health
Combined Massachusetts General Hospital and Brigham & Women’s Hospital Orthopaedic Trauma Fellowship Program
Dalhousie University
Denver Health Medical Center
Duke University
Hospital for Special Surgery
R. Adams Cowley Shock Trauma Center
Regions Hospital/University of Minnesota
San Diego Orthopaedic Trauma Fellowship
Sunnybrook Health Sciences Centre

The University of Texas Health Science Center at Houston
Trauma Fellowship of Oklahoma
UCSF SFGH Orthopaedic Trauma Institute
UMDNJ/University Hospital/New Jersey Medical School
University of California, Davis Medical Center
University of California, San Diego
University of Missouri Department of Orthopaedic Surgery
University of Washington/Harborview Medical Center
Vanderbilt University Medical Center
Wake Forest University Health Sciences
Washington University School of Medicine

Research Committee Selects Resident Research Grant Recipients

Daniel Bracey, MD
Wake Forest School of Medicine
“A Novel Xenograft-derived Bone Scaffold for Improved Treatment of Critical Bone Defects”

Jacques Hacquebord, MD
Harborview Medical Center
“The role of ESET Histone Methyltransferase in Fracture Healing”

Lorraine Stern, MD
University Hospitals — Case Medical Center
“Removal of Dead Skin Cells After Immobilization: Does it Matter When Prepping the Surgical Site?”

Advanced Clinical Education Program
Dedicated to Supporting the Best in Fellowship Education
AOTNA Research Committee Announces 2013 Kathryn Cramer Memorial Award Winner

Justin Haller, MD
University of Utah
“Inflammatory Response Following Tibial Plafond Fracture”

Dr. Haller is a 3rd year resident at the University of Utah. His project entitled, “Inflammatory Response Following Tibial Plafond Fracture,” was selected from a group of outstanding proposals submitted to the research committee. This goal of this project is to characterize the inflammatory response following a tibial plafond fracture and identify any correlation between inflammation and the subsequent development of post-traumatic osteoarthritis. The goal of the Kathryn Cramer Memorial Award is to provide an opportunity to orthopedic residents and young faculty to enhance their education and professional development.

The AOSpine North America Research Committee is proud to announce the winners of the Young Investigators Research Grant Awards for 2013. The purpose of these grants is to encourage new investigators who have a desire to perform high-quality, clinically relevant spinal or spinal cord research in basic or clinical science by providing start-up funding of $30,000 for one year.

Michael Kelly, MD
Washington University School of Medicine
“A Randomized Trial of Two Tranexamic Acid Dosing Protocols in Adult Spinal Deformity Surgery”

Eugene Koh, MD, PhD
University of Maryland School of Medicine
“Identification of Novel Drugs to Enhance Nerve Regeneration”

Ahmad Nassr, MD
Mayo Clinic
“Effects of Human Recombinant Parathyroid Hormone (PTH) Treatment on the Osteoporotic Spine: A Rabbit Model of Spinal Instrumentation and Fusion”

Mohammed Shamji, MD, PhD
University of Toronto
“Pathomechanisms in the Development of Pain Hypersensitivity in Disc Herniation Radiculopathy”

The projects will be carried out in 2013 – 2014, and they certainly represent a significant contribution to the clinical and basic science investigators in North America. For AOSNA, it is a pleasure to be able to invest in promising projects like these and to incentivize members to actively take part in the scientific development of the region.