31st Annual
Combined Orthopaedic Spring Symposium

April 8-9, 2016
Hawaii Prince Hotel - Honolulu
Welcome from HOA President

Aloha & Welcome to the 31st Annual Combined Orthopaedic Spring Symposium! This annual event provides opportunities for the orthopaedic community in Hawaii to learn about the latest advances in orthopaedic surgery from nationally renowned experts in their fields. The symposium features a constructive forum for discussions among HOA members, residents, medical students and allied health professionals from across our state. It also provides a venue to feature the research being conducted by University of Hawaii and Tripler Army Medical Center residents. And, don't forget the opportunities that the symposium will provide to network with fellow specialists at the awards banquet on Saturday, Apr. 9. This is truly a can't-miss event, providing opportunities to gain knowledge and earn CME credit, participate in discussions and catch-up with our local orthopaedic ohana over the course of just a few days. Mahalo for joining us!

Darren Egami, MD
HOA President & Symposium Chair

HOA Membership Information

Contact HOA Executive Director Cathy Iwai at 808-630-1586 or cathy.iwai@hawaiiantel.net if you are interested in becoming a member of the Hawaii Orthopaedic Association.

Hawaii Orthopaedic Association
P.O. Box 61207
Honolulu, HI 96839
Fax: 808-536-4141.

Americans with Disability Act (ADA)

Participants with special needs should contact Cathy Iwai at 808-630-1586 or cathy.iwai@hawaiiantel.net to discuss desired accommodation(s).
Learning Objectives

The program content of the Hawaii Orthopaedic Association Spring Symposium is designed to identify and address the advances and changes that occur throughout the many areas of orthopaedic surgery. The topics are intended to relate both directly and indirectly to the practice of each practitioner. At the conclusion of this educational activity, participants will be able to:

1. Discuss and identify best practices in topics discussed.
2. Learn how to improve patient outcomes through improving implementation of best practices.
3. Continue to educate and supplement performance and competence in orthopedic surgery.

CME Credits

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Hawai‘i Consortium for Continuing Medical Education (HCCME) and the Hawaii Orthopaedic Association. The Hawai‘i Consortium for Continuing Medical Education is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The Hawaii Consortium for Continuing Medical Education designates this live activity for a maximum of 15.0 *AMA PRA Category 1 credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Disclosure Declaration

The following have no relevant financial relationships with any commercial interest:

<table>
<thead>
<tr>
<th>Planners</th>
<th>Residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wei Chin Chen, MD</td>
<td>Christopher Belyea, MD</td>
</tr>
<tr>
<td>Darren Egami, MD</td>
<td>Sean Brugman, MD</td>
</tr>
<tr>
<td>Elizabeth Ignacio, MD</td>
<td>Edward Chan, MD</td>
</tr>
<tr>
<td>Cathy Iwai</td>
<td>James Deal, MD</td>
</tr>
<tr>
<td>Byron Izuka, MD</td>
<td>Daniel Derosa, MD</td>
</tr>
<tr>
<td>John Juliano, MD</td>
<td>John Dupax, MD</td>
</tr>
<tr>
<td>Craig Ono, MD</td>
<td>Michael Finnern, MD</td>
</tr>
<tr>
<td>Paul M. Ryan, MD</td>
<td>Shawn Gee, MD</td>
</tr>
<tr>
<td>Jerry Van Meter, MD</td>
<td>Mitch Harris, MD</td>
</tr>
<tr>
<td>Joseph Varcadipane, MD</td>
<td>Adam Hines, MD</td>
</tr>
</tbody>
</table>

The following have relevant financial relationships to disclose:

Michael Ast, MD

- Consultant, Speakers Bureau – Smith & Nephew
- Consultant, Stock Equity – OrthAlign, Inc.
- Committee Membership – Eastern Orthopaedic Association

Jack Farr, MD

- Research or institutional support has been received from: Active Implant, Arthrocare a Smith & Nephew Company, Ceterix, Sanofi Company formally Genzyme Biosurgery, Histogenics, Johnson and Johnson Companies, Depuy/Mitek, Knee Creations, LLC, Moximed, Inc., Nutech Medical, Inc., Ortho Regenerative Technologies, Inc., and Zimmer.
- Miscellaneous non-income support, commercially derived honoraria, or other nonresearch related funding has been received from: Advanced Biosurfaces, Arthrex, Sanofi Company formally Genzyme Biosurgery, Johnson and Johnson Companies, Knee Creations, LLC, MedShape, Inc., Regentis, RTI Biologics, Inc., and Zimmer.
- Royalties have been received from: Arthrex, Johnson and Johnson Companies, Depuy Orthopaedics, Nutech Medical, Inc., and SBM, Inc.
- Stock or stock options held in: MedShape, Inc.
- Board Member/Committee Appointments for a Society: Cartilage Research Foundation, Inc. Treasurer; ICRS Regulatory & Industry Liaison Committee 2010 – 2012; ICRS Chairperson for Liaison Committee 2012 – Present; ICRS Education & Meeting Committee 2015 - Present; Patellofemoral Foundation Vice President; International Patellofemoral Study Group Treasurer; ISAKOS Patellofemoral Scoring Task Force 4/1/2013 to 3/31/2017; ISAKOS Knee Arthroplasty & Alternatives Committee 20015-2019; Medical/Orthopaedic Publications Editorial/Governing Board; American Journal of Sports Medicine Principal Reviewer; Cartilage Associate Editor; Clinical Orthopaedics and Related Research Reviewer; Journal of Knee Surgery Reviewer, Guest Associate Editor; Knee Surgery, Sports Traumatology, Arthroscopy Reviewer; and The Knee Reviewer.

Jesse Jupiter, MD

- Consultant - AO Foundation
- Honoraria for Speaking - APTIS, DePuy Synthes, and Trimed
Best Resident Paper Awards

Richardson Awards: The Richardson Fund was established in 1982 to honor the memory of B. Allen Richardson, MD. Dr. Richardson was one of the first Board-Certified Orthopaedic Surgeons in Honolulu, where he practiced for nearly 30 years. He was an active member of the teaching staff of the University of Hawaii Orthopaedic Residency Training Program from its inception in the mid-1960s, and was a staunch supporter for the creation of the John A. Burns School of Medicine. The proceeds of the Richardson Fund are used to award first, second and third place prizes for the best resident papers presented at the Annual Combined Orthopaedic Spring Symposium.

Shriners Award: The Shriners Award is presented annually and was established to honor an orthopaedic resident who has completed a rotation at the Shriners Hospital for Children in Honolulu. Residents present their completed papers to medical staff and allied health professionals at the Shriners Hospital's patient care conference. The paper must be written to meet standards for publishing in clinical publications.

Acknowledgements

Thank you for the Support of all of Our Exhibitors...

- All Island Surgical
- Advanced Imaging Institute
- Arthrex
- Automated Healthcare Solutions
- Bioventus
- Deupy Synthes (Johnson & Johnson)
- Ferring Pharmaceuticals
- Halyard Health
- Invision Imaging
- Hawaii Diagnostic Radiology Services
- Medartis, Inc.
- NuVasive, Inc.
- Smith & Nephew - Endo
- Smith & Nephew - Navio & Wound
- Smith & Nephew - Recon & Trauma
- Wright Medical
- Zimmer Biomet

Special Thanks to...

- Shriners Hospital for Children - Honolulu
- Tripler Army Medical Center Orthopaedic Residency Program
- University of Hawaii Orthopaedic Residency Program

...and a Big Mahalo to...

- HOA Executive Director Cathy Iwai for all of your work in overseeing another successful year!
31st Annual Combined Orthopaedic Spring Symposium  
Friday, April 8, 2016

6:45  Registration / Continental Breakfast / Exhibits

7:00  Welcome and Opening Remarks - Darren Egami M.D.

7:10  Edward Chan MD - Bisphosphonate-Associated Atypical Femur Fractures Versus Osteoporotic Femur Fractures: A Histologic Analysis

7:15  Shawn Gee MD - Characterization and Incidence of Missed Posterior Malleolus Fractures on Plain Radiographs

7:20  Discussion

7:30  Dean Lorich MD - Ankle Fractures: How Little We Understand

8:15  Jesse Jupiter MD - Complex Fracture Dislocations About the Wrist

9:00  Discussion

9:10  Break and Exhibits / PLEASE VISIT EXHIBITS

9:40  Charles Price MD - Topics in Pediatric Orthopedics: Why Do We Operate on Pediatric Fractures?

10:25 Michael Ast MD - Same-Day Joint Replacements, the Outpatient Experience

11:10 Jack Farr MD - Current Status of Cartilage Restoration

11:55 Discussion

12:00 Lunch, Break and Exhibits, HMSA Presentation, PAC Discussion

1:00  Dean Lorich MD - Patella Fractures: An Unsolved Problem

1:45  Craig Bottoni MD - Glenohumeral Instability, Options for Treatment, Latarjet Results and Outcomes.

2:30  Jesse Jupiter MD - Tips on Management of Elbow Disasters

3:15  Discussion

3:30  Break and Exhibits / PLEASE VISIT EXHIBITS

3:45  Andrew Kayes MD - Complications of MRI Contrast

4:05  Charles Price MD - Topics in Pediatric Orthopedics: Nutrition and Vitamin D for Bone Healing

4:40  Michael Ast MD - Total Joint Revision

5:25  Discussion
31st Annual Combined Orthopaedic Spring Symposium
Saturday, April 9, 2016

7:00  Registration / Continental Breakfast / Exhibits
7:10  John Dupaix MD - Patterns of Injuries Arising in Contralateral Limbs with Dismounted Complex Blast Injuries Resulting in Lower Extremity Amputation
7:15  Adam Hines MD - Risk Factors for Complications in Open Forearm Fractures in the Pediatric Patient
7:20  Chris Belyea MD - Utility of Intraoperative Fluoroscopy for Increasing Accuracy of Acetabular Component Placement in Total Hip Arthroplasty
7:25  John Johnson MD - Pediatric Orthopedic Related Injuries Associated with Recreational Trampoline Use
7:30  Jesse Jupiter MD - The Qualifications Required to Be a Great Surgeon
8:15  Charles Price MD - Hip Dysplasia: Thoughts for Prevention and Treatment
9:00  Jack Farr MD: Treatment Options for Unicompartmental Arthritis
9:45  Break and Exhibits / PLEASE VISIT EXHIBITS
10:15 Dean Lorich MD - Femoral Neck Fractures: My Thoughts
11:00 Michael Ast MD - Metal Wear Related Complications
11:45 Jack Farr MD - Patellofemoral Pain and Instability Management
12:30 Lunch / Break and Exhibits
1:30  Nick Scarcella MD - Biomechanical Model of Differing Tension Band Techniques
1:35  Cole Turner MD - Prospective Comparison of Arthroscopic Versus Open Implantation of DeNovo
1:40  Daniel Derosa MD - Incidence of Intra-Articular Loose Bodies in Patella Dislocation
1:45  James Shaha MD - Preoperative Resilience is Predictive of Postoperative Return to Duty and Functional Outcome Scores Following Arthroscopic Bankart Repair
1:50  Discussion
2:00  James Deal MD - Early versus Delayed Weight Bearing after Microfracture for Osteochondral Defects of the Talus, a Prospective Randomized Controlled Trial
2:05  Mitch Harris MD - The reliability of Kager’s Triangle in Detecting Acute Achilles Tendon Ruptures
2:10  Christopher Lau MD - Collegiate Women’s Volleyball Injuries: Evaluating Injury Differences Between Indoor and Beach Volleyball
2:15  Liang Zhou MD - Long-term Clinical Outcomes Following Open and Arthroscopic Bankart Repair
2:20  Discussion
2:30  Michael Finnern MD - Occupational Outcomes of Flatfoot Reconstructive Surgery
2:35  Steven Wilding MD - Redefining Optimal Medullary Canal Fill and Flexible Intramedullary Nailing of Pediatric Femur Fractures
2:40  Sean Brugman MD - Syrinx Associated Scoliosis vs. Comparison of Retrospective Matched Cohorts
2:45  John Johnson MD - Is Ultrasound and Clinical Exam as Effective as MRI in Assessing Tendon Approximation of Achilles Tendon Tears? A Clinical Study.
2:50  Discussion
3:00  Closing Remarks
6:00  Banquet
GUEST SPEAKERS

Michael P. Ast, MD
* Medical Director, Robotic Joint Replacement Program, Robert Wood Johnson University Hospital, Hamilton, NJ
* Director, Outpatient Joint Replacement, Mercer County Surgery Center, Lawrenceville, NJ

Craig R. Bottoni, MD
* Chief of Sports Medicine, Tripler Army Medical Center, Honolulu, 2010 through Present
* Graduate of West Point Sports Medicine Fellowship 2000
* Chief of Surgery and Assistant Chief Medical Officer, Doha, Qatar 2007-2009
* Recipient of the O'Donohue 2006 Excellence and Research for studies/sports medicine award, 2005
* Recipient of the 2016 Hughston Award for the best study published in the American Journal of Sports Medicine, 2015

Jack Farr II, MD
* Sports Medicine Committee, OrthoIndy Orthopaedics, Indianapolis, IN
* Board Member, International Cartilage Repair Society & Patellofemoral Foundation

Jesse B. Jupiter, MD
* Hansjorg Wyss/AO Foundation Professor of Orthopaedic Surgery, Harvard Medical School, Cambridge, MA
* Orthopaedic Surgeon, Newton-Wellesley Hospital, Newton, MA

Andrew Kayes, MD
* Private Practice Radiologist, Maui, Oahu, Honolulu
* National Private Practice Representative for the American College of Radiology
* Radiology Residency UCLA Medical Center, 2010-2005
* Musculoskeletal Imaging Fellowship, Mayo Clinic, 2005 – 2006
* Assistant Professor of Radiology at UCLA Medical Center

Dean G. Lorich, MD
* Director, Department of Orthopaedic Surgery, Presbyterian Hospital, New York, NY
* Associate Director, Orthopaedic Trauma Service, Hospital for Special Surgery, New York, NY

Charles T. Price, MD
* Director, International Hip Dysplasia Institute, Orlando Health, Orlando, FL
* Professor of Orthopedic Surgery, University of Central Florida College of Medicine, Orlando, FL

###
Bisphosphonate-Associated Atypical Femur Fractures Versus Osteoporotic Femur Fractures: A Histologic Analysis

Edward Chan MD, Jae You MD, Kevin Christensen MD
University of Hawaii Orthopaedic Residency Program
Honolulu, HI

BACKGROUND: Atypical fractures related to long-term bisphosphonate use have been reported in both the subtrochanteric and diaphyseal regions of the femur. The pathophysiology behind these atypical fractures is not well understood.

PURPOSE: The purpose of our study was to compare the histologic analyses of intramedullary reamings between atypical, bisphosphonate-associated femur fractures and typical, osteoporotic femur fractures.

METHODS: We prospectively enrolled patients over the age of 50 who sustained either a typical, osteoporotic femur fracture or atypical, bisphosphonate-associated femur fracture, and underwent intramedullary nail fixation. The intramedullary reamings were collected and sent to the pathology department for histological analysis under hemaxoylin and eosin staining.

RESULTS: Twenty-one patients fitting the inclusion criteria have been enrolled so far. Seven had a history of bisphosphonate use, and four had atypical fractures, including one patient with bilateral femur fractures. So far, no obvious consistent differences in the pathology reports have been observed between typical and atypical fractures. Final results are pending.

CONCLUSION: Pending
Novel Radiographic View to Prevent Missed Posterior Malleolus Fractures

Shawn Gee, CPT, MC, USA, Tripler Army Medical Center
Mitch Harris, CPT, MC, USA, Tripler Army Medical Center
Paul Ryan, LTC, MC, USA, Tripler Army Medical Center
Claude Anderson, CAPT, MC, USN, Tripler Army Medical Center

BACKGROUND: Posterior malleolus fractures are common and portend a poor prognosis in many patients if left unrecognized and untreated. These fractures can be challenging to visualize on standard radiographic views of the ankle (anteroposterior, lateral, and mortise views) because the fracture line travels obliquely, rather than perpendicular, to the standard lateral radiographic view. We propose a novel radiographic view to increase the sensitivity of radiographic detection of posterior malleolar fractures.

RESULTS: Pending.
Ankle Fractures: How Little We Understand

Dean Lorich, MD

Abstract available upon request.
Complex Fracture Dislocations About the Wrist

Jesse Jupiter, MD

Abstract available upon request.
Topics in Pediatric Orthopedics: 
Why Do We Operate on Pediatric Fractures?

Charles Price, MD

Abstract available upon request.
Same-Day Joint Replacements: The Outpatient Experience

Michael Ast, MD

Abstract available upon request.
Current Status of Cartilage Restoration

Jack Farr, MD

Abstract available upon request.
Patella Fractures: An Unsolved Problem

Dean Lorich, MD

Abstract available upon request.
Glenohumeral Instability: Options for Treatment, Latarjet Results and Outcomes

Craig Bottoni, MD

Abstract available upon request.
Tips on Management of Elbow Disasters

Jesse Jupiter, MD

Abstract available upon request.
Complications of MRI Contrast

Andrew Kayes, MD

Abstract available upon request.
Topics in Pediatric Orthopedics:
Nutrition and Vitamin D for Bone Healing

Dean Lorich, MD

Abstract available upon request.
Total Joint Revision

Michael Ast, MD

Abstract available upon request.
Patterns of Injuries Arising in Contralateral Limbs with Dismounted Complex Blast Injuries Resulting in Lower Extremity Amputation

John Dupaix, MD, Department of Orthopaedic Surgery University of Hawaii, John A Burns School of Medicine, Honolulu, HI
Paul Ryan, MD, LTC, USA Army, Department of Orthopaedic Surgery, Tripler Army Medical Center, Honolulu, HI

OBJECTIVE: The purpose of this study is to evaluate the patterns of injury in the rear (contralateral) limb in dismounted troops sustaining single lower extremity amputation secondary to blast injury. It is expected that analysis may help predict pattern of injuries when such amputations are observed and thus help guide acute trauma care.

METHODS: This study is a review of data collected prospectively from the US and UK Joint Theater Trauma Registries (JTTR) of consecutive patients admitted to the UK Role 3 hospital at Camp Bastion, Afghanistan, from January 1, 2009, to February 29, 2012, with an injury caused by an IED blast while dismounted. Only military service members arriving alive were included in this database. Boards of the United Kingdom (UK) Joint Medical Command Academic Unit and the United States (US) Army’s Institute for Surgical Research approved this study. Database was searched for those service members sustaining single leg amputations. Free text injuries were coded by injury type and location. Statistical analysis forthcoming. *Correlation to amputation level and relative risk of types of injuries to be calculated. *Fisher’s exact test will be used to compare proportions of types of injuries in those sustaining dismounted blast injuries resulting in limb amputation versus no such injury.

RESULTS (preliminary and subject to change): There were 457 Service members in the data base. 99.9% male 37.6% of whom sustained at least one extremity amputation. 116 had e” 2 limbs amputated, 56 had a single limb amputation, 55 were lower extremities (29 RLE, 26 LLE; 4 Symes, 2 through ankle, 29 BKA, 13 through knee AND 7 AKA).

In terms of the contralateral lower limb there were 13 patients with foot fractures: 2 toe, 6 forefoot, 8 midfoot, 5 hindfoot. For the lower leg 13 had isolated soft tissue injuries, 18 with tibial fractures (7 distal, 11 mid, 4 proximal), 16 with fibular fractures (8 distal, 8 mid, 3 proximal). For the upper leg there were 7 with femur fractures, 1 with a patellar fracture and 18 with significant isolated soft tissue injuries. There were also 19 with groin wounds.

As to the contralateral upper limb there were 11 with skeletal injury: 8 with finger fractures, 4 with wrist/hand, 1 with radius and 1 with ulna fractures. There were 12 with significant soft tissue injuries, 6 of which were isolated.

For the ipsilateral upper limb there were 11 with skeletal injury: 7 with finger fractures, 4 with wrist/hand, 1 with radius and 4 with ulnar fractures. There were 17 with significant soft tissue injury, 14 of which were isolated.

CONCLUSION: To be determined following further analysis

###
Risk Factors for Complications in Open Forearm Fractures in the Pediatric Population

Hines AC, Elliot M, Smit K, Sucato D, Wimberly RL, Riccio A
Tripler AMC - Honolulu, HI
TSRH - Dallas, TX

INTRODUCTION: Complications such as infection and refracture are well reported following the treatment of pediatric open both bone forearm fractures. The purpose of this paper is to determine if patient, injury and treatment characteristics can be used to predict the occurrence of infectious and other complications following the surgical management of this common pediatric injury.

METHODS: This is an IRB-approved retrospective review at a single-institution Pediatric Level 1 Trauma Center from 2007-2013. The trauma and billing databases were queried for all patients with open forearm fractures. Medical records were reviewed to determine grade of the open fracture, time to administration of initial antibiotics, time from injury to surgery, type of fixation, length of immobilization, and complications. Radiographs were reviewed to document fracture characteristics. Statistical analysis was performed to identify any associations between injury or treatment parameters and post-operative complications.

RESULTS: 262 patients met inclusion and exclusion criteria with an average age of 9.7 years. There were 219 Grade 1 open fractures, 39 Grade 2 fractures, and 4 Grade 3 fractures. Twenty-five (9.5%) patients experienced complications, including 9 Infections (3.4%) and 6 refractures (2.3%). Twenty-six (9.9%) patients required repeat operating room visits. Contaminated wounds had a greater chance of being infected (21% vs 2.2%, p=0.002). No difference in infection rate was seen with regard to timing of antibiotics (p=0.87), timing to formal debridement (p=0.20), Grade 1 versus Grade 2/3 open fractures (3.4% vs 5.0%, p =0.64), burying intramedullary fixation or not (3.5% vs 4.2%, p>0.99), 24 hours vs 48 hours of post-operative IV antibiotics (5.2% vs 3.5%, p =0.53), or when comparing diaphyseal, distal, and Monteggia fracture patterns (3.6 vs 2.9% vs 5.9%, p=0.81). Rate of refracture was not increased based on Grade of open wound (p>0.99) or fracture type (0.4973), although 5 of the 6 refractures were in diaphyseal injuries.

DISCUSSION: In this large series of open pediatric both bone forearm fractures, the only statistically significant risk factor for infection was initial wound contamination. The rate of infection did not vary with timing of antibiotics or surgery, grade and type of open fracture, or length of post-operative antibiotics. Grade of the open wound or fracture pattern did not correlate to the risk of refracture. As wound contamination was the only predictor of infectious complications, surgeons should consider planned repeat irrigation and debridement for open forearm fractures with contaminated wounds.
Utility of Intraoperative Fluoroscopy for Increasing Accuracy of Acetabular Component Placement in Total Hip Arthroplasty

Christopher M Belyea, Jimmy Shaha, Duke Yim
Tripler Army Medical Center

BACKGROUND: This study involves a retrospective review of over the course of 6 years (2009-2015) of consecutive patients who underwent total hip arthroplasty at a single military institution by one of two fellowship trained total joint arthroplasty (TJA) orthopaedic surgeons.

Data will be collected using intraoperative and postoperative radiographs to compare the accuracy of acetabular component placement as measured by acetabular inclination, leg length discrepancy and offset. The data will be subdivided into three groups 1) THAs performed by a newly fellowship trained TJA surgeon without the aid of intraoperative fluoroscopy 2) THAs performed by a newly fellowship trained TJA surgeon with the aid of intraoperative fluoroscopy 3) THAs performed by a seasoned fellowship trained TJA surgeon without the aid of intraoperative fluoroscopy.

The study’s hypothesis is that the use of intraoperative fluoroscopy increases the accuracy of acetabular component placement with results comparable to a seasoned fellowship trained TJA surgeon.
Pediatric Orthopaedic Related Injuries Associated with Recreational Trampoline Use

CPT John Johnson, DO, Tripler Army Medical Center, Honolulu, HI
MAJ Jeffrey Knox, MD

INTRODUCTION: Since the development of the recreational trampoline in the 1950’s, its use by the pediatric population was identified as a posing risk of injury. Due to its increased popularity in recent years, orthopaedic surgeons nationwide are treating more injuries caused by this popular activity among children. There has been increasing interest in and studies of injuries associated with trampoline use but few large-scale studies are available in recent literature. In particular, little is written on the subset of patients requiring hospital admission due to such injuries. The purpose of our study is to evaluate the characteristics and hospital charges associated with trampoline-related orthopaedic injuries.

METHODS: We examined the 2012 dataset of the HCUP-KID database, which compiles a nationwide sample of pediatric admissions. The E-codes were evaluated to identify patients injured from trampoline use and ICD-9 codes were used to identify those with a major orthopaedic injury. Injury details were determined from the ICD-9 code including injury type, location, and pattern. Demographic information was compiled as well as details of the hospital stay including length of stay, occurrence of a major procedure, in-hospital complications and mortality, as well as hospital charges and primary payer. The included patients were divided into four groups based on age: Group 1: 1-4 years; Group 2: 5-9 years; Group 3: 10-14 years; and Group 4: 15-18 years. Data was then compared between the different age groups using the Student’s t-test and ANOVA analyses.

RESULTS: There were a total of 341 patients that met our inclusion criteria with an average age of 8.7 years. Overall, within the four age groups, 52.5% of patients experienced an upper extremity injury, followed by 40.7% lower extremity injury and 53% were male. Lower extremity injuries were significantly more prevalent among age group 1, representing 78.69%. (p < .0001) This group also had a significantly higher proportion of femur injuries accounting for 77% compared with other groups. (p = 0.007) However, lower extremity injuries showed a decreasing incidence in older children. Upper extremity injuries were significantly more common in age group 2 (70.6%; p<0.005), which also had a decrease of incidence within older children. Distal humerus injuries were also found to be significantly higher among group 2 (59%). Open fractures were the most common associated injury occurring in all age groups, but occur more frequently within group 3 (18.5%). Spinal injuries appear more frequently among the older age groups, specifically group 4, who had the highest proportion accounting for 31.7%

The average hospital stay for all patients was 1.7 days with the oldest age group (15-18 yrs) requiring twice the length of stay compared with the other groups. There were no deaths observed during hospital stay for all groups. The overall average hospital charge for all patients was $21,609. The highest charges were observed in the oldest age group with an average of $44,289. An increase of hospital expense was associated with the increase of patient age.

(continued on next page)
DISCUSSION: The recreational use of trampolines in the U.S. poses a potential threat to the safety of the pediatric population. We identified a significant burden of orthopaedic injuries caused by trampolines resulting in significant injury, long hospital stays, and significant cost to the healthcare system. The nature of injuries differed based on the age of the patient with more complex injuries occurring within older children (10-18 yrs). Promoting awareness of orthopaedic related injuries will help prevent future orthopaedic related incidence.
The Qualifications Required to be a Great Surgeon

Jesse Jupiter, MD

Abstract available upon request.
Hip Dysplasia: Thoughts for Prevention and Treatment

Charles Price, MD

Abstract available upon request.
Treatment Options for Unicompartmental Arthritis

Jack Farr, MD

Abstract available upon request.
Femoral Neck Fractures: My Thoughts

Dean Lorich, MD

Abstract available upon request.
Metal Wear Related Complications

Michael Ast, MD

Abstract available upon request.
Patellofemoral Pain and Instability Management

Jack Farr, MD

Abstract available upon request.
Biomechanical Model of Differing Tension Band Techniques

Nick Scarcella MD, Byron Izuka MD, Scott Miller PhD, Bryce Adams, Brandon Chau, Sy Yoshida
University of Hawaii
Honolulu, HI

OBJECTIVE: Tension band constructs are commonly used to repair transverse patellar fractures. A number of studies have tested the biomechanical properties of differing tension band constructs, including various configurations and fixating materials/materials. These studies have primarily utilize a 3 point bending model in isolation. We plan to test 3 point bending with simultaneous tension application for a more clinically relevant model.

METHODS: We designed a 3D model of a patella and matching trochlea to mimic a transverse patella fracture. Various tension band techniques with varying patterns and materials were tested to failure with an instron machine with simultaneous 3 point bending and tension.

RESULTS: TBD

CONCLUSIONS: TBD
Comparative Outcomes for Treatment of Articular Cartilage Lesions in the Ankle with DeNovo® NT Natural Tissue Graft: Open vs. Arthroscopic Treatment

CPT Robert Turner, M.D., LTC Paul M. Ryan, M.D.,
LTC Adam T Groth, M.D., CAPT Claude D. Anderson, M.D.

BACKGROUND: Treatment of osteochondral defects of the talus with juvenile cartilage allograft is a relatively new procedure. Although other treatment options exist for large osteochondral defects of the talus, the potential advantage of particulated juvenile allograft is the ability to perform the procedure arthroscopically or through a minimal approach. While multiple case reports have been published on techniques, there is only one outcome study published to date. No previous studies have looked at the results of an arthroscopic approach and no previous studies have compared an arthroscopic technique to an open approach. The purpose of this study was to compare the outcomes of an arthroscopic transfer technique to the previously published open technique.

METHODS: A total of 33 patients underwent treatment of talar cartilage lesions with DeNovo® NT Natural Tissue Graft. Nineteen of these were done arthroscopically and 14 were done with an open arthrotomy. There was no statistically significant difference between the groups with respect to age, lesion width, lesion depth, lesion length, or operative time. Scores for 6 different validated outcome measures were recorded for patients in each group pre-operatively and subsequently at 6 months, 1 year, 18 months, and 2 years.

RESULTS: Compared to pre-operative measures, there were statistically significant differences found at 2 years in Foot and Ankle Ability Measure - ADL Scale; and the SF12 Mental Health Scale. Both favored the arthroscopic approach over the open approach. There were no other statistically significant post-operative differences found between open and arthroscopic approaches with regards to VAS Pain Scale, AOFAS Ankle-Hindfoot Scale, Foot and Ankle Ability Measure - Sport Scale, or SF12 Physical Health Scale.

CONCLUSIONS: Treatment of talar articular cartilage lesions with DeNovo® NT Natural Tissue Graft is associated with improved outcomes at 2 years with regards to several validated outcome measures regardless of technique utilized. At 2 years follow up, there appears to be statistically significant improved outcomes utilizing an arthroscopic technique versus open technique specifically for the ADL scale and SF12 Mental Health Scale. This data supports use of arthroscopically directed placement of DeNovo® NT Natural Tissue Graft over open placement.
Incidence of Intra-articular Loose Bodies in Acute Patellar Dislocations

CPT Daniel C. DeRosa, DO
Tripler Army Medical Center, Honolulu, HI
CPT Robert C. Turner, MD, CPT Jeremy R. McCallum, MD, Craig Bottoni, MD; CDR(ret)
Douglas J. Rowles, MD, John M. Tokish, MD

INTRODUCTION: To retrospectively evaluate the incidence of intra-articular pathology by magnetic resonance imaging (MRI) in patients following an acute patellar dislocation.

METHODS: We performed a retrospective review of all acute patellar dislocations at a single institution over a ten-year period. Inclusion criteria consisted of isolated patellar dislocations without concomitant ligamentous injuries. MRI findings, specifically osteochondral loose bodies, surgical indications based upon MRI findings, and key demographics such as sex, age, and laterality were documented.

RESULTS: One hundred one patients sustained an isolated acute patellar dislocation, of which 62 were male. Of the 101 patients, 17 (16.8%) were found to have a loose body on MRI. The average age was 22.8 (r: 12 to 40), with 13 men and 4 women. Of the 17 patients with loose bodies on MRI, 14 (82.4%), underwent operative arthroscopy for loose body removal. An additional 16/101 (15.8%) of patients underwent operative intervention at a later date related to patellar instability, including; nine tibial tubercle osteotomies, six medial patellofemoral ligament reconstructions, and one chondroplasty.

CONCLUSION: The management of an acute patellar dislocation remains controversial. We found that 16.8% of patients who sustained an isolated acute patella dislocation were diagnosed with an intra-articular loose body by MRI. Of these, 82.4% underwent arthroscopy to remove the loose bodies. An MRI after acute patellar dislocation can assist with an early diagnosis and intervention to prevent future cartilage damage. This is the first study to address the incidence of osteochondral loose bodies diagnosed by MRI that require surgery following an acute patellar dislocation.

###
Preoperative Resilience is Predictive of Postoperative Return to Duty and Functional Outcome Scores Following Arthroscopic Bankart Repair

Shaha, JS, Shaha SH, Tokish JT
Tripler AMC, Honolulu, HI

INTRODUCTION: Resilience, which is a psychometric property related to “hardiness” or the ability to respond to challenging situations, is a recognized predictor in many outcomes’ domains. This has been studied extensively in stressful situations such as military returning from deployment, serious disease, and traumatic injury. To date however, no study has assessed the role of patient resiliency with respect to surgical outcome. The purpose of this study was to assess the role of preoperative resiliency as calculated by the Brief Resiliency Score (BRS) on relevant surgical outcomes, including the time required to return to full unrestricted activity following an arthroscopic Bankart repair. In addition, the correlation between pre-operative BRS with post-operative BRS, post-operative Western Ontario Instability Index (WOSI), American Shoulder and Elbow (ASES) and Single Assessment Numeric Evaluation (SANE) scores was also assessed.

METHODS: This is a retrospective review of prospectively gathered data on 25 consecutive active duty military patients undergoing an arthroscopic Bankart repair for instability. The mean follow-up was 13.3 months (range, 11-15) as the primary outcome was return to unrestricted duty which occurs within the first year post-intervention. There were 24 males and 1 female. All patients were on unrestricted active military duty prior to injuring the operative shoulder. All patients completed BRS, WOSI, ASES, and SANE questionnaires prior to operative intervention. They then completed the same questionnaires at the most recent follow-up as well as an additional questionnaire on military duty status (unrestricted duty, limited duty, medical separation from the military). Patients were divided into low resiliency and high resiliency groups based on a score of XXX in the BRS, and their outcomes compared.

RESULTS: All patients had been cleared for return to full-duty or were undergoing a medical separation at final follow-up. Pre-operative BRS was significantly correlated with time to return to full duty, need for medical separation from the military, post-operative WOSI, SANE and ASES scores and change between pre- and post-operative WOSI, ASES and SANE scores. Those patients with high resiliency returned to full duty significantly faster than the low resiliency group (4.4 v 6.7 months, p<0.01), had better post-operative WOSI (285.5 v 1073.2, p<0.01), SANE (0.8 v 2.8, p=0.03), ASES scores (91.5 v 67.6, p=0.03) and were 5 times less likely to be medically separated from the military (7.7% v 38.5%, p<0.01). Also, patients with high resiliency had significantly greater improvement comparing pre-operative to post-operative WOSI (942.0 v 427.6, p=0.04), ASES (22.0 v 7.5, p=0.04) and SANE scores (2.5 v 1.3, p=0.01).

CONCLUSIONS: Preoperative resiliency was highly predictive of the time required to return to full, unrestricted military duty. It was also predictive of post-operative subjective and objective outcomes as well as overall improvement between pre- and post-operative outcomes scores. Highly resilient patients were able to return to duty 2 months faster with significantly fewer requiring medical separation from the military than those lacking resiliency. Further study is needed to assess the role of preoperative resilience optimization on those lacking resiliency.

###
Early Versus Delayed Weightbearing after Microfracture for Talar Osteochondral Lesions: A Prospective Randomized Trial

Deal JB Jr, Patzkowski JC, Groth AT, Ryan PM

BACKGROUND: Bone marrow stimulation techniques, specifically arthroscopic microfracture, have become the therapy of choice for osteochondral lesions (OCLs) of the talar dome less than 15 mm2 in size. Traditionally, these repairs have been protected with non-weight bearing period of 6-8 weeks postoperatively. However, recent research has suggested postoperative early weight bearing (EWB) after microfracture may produce outcomes equivalent to delayed weight bearing (DWB). We performed a prospective, randomized trial to determine whether the results of EWB after microfracture for talar OCLs are equivalent to DWB.

METHODS: We randomized 37 patients (37 ankles) undergoing arthroscopic microfracture for OCLs of the talar dome to either EWB or DWB protocols. All cases were performed by fellowship trained foot and ankle surgeons at Tripler Army Medical Center or San Antonio Military Medical Center. Demographic variables, Visual Analog Scale (VAS) scores, and American Orthopaedic Foot & Ankle Society (AOFAS) ankle-hindfoot scale scores were collected pre-operatively and at 6 weeks, 3 months, 6 months, 1 year, and 2 years postoperatively.

PRELIMINARY RESULTS: The mean age at surgery was 34.1 years (range 21-50 years). In the EWB group, the mean VAS score was 3.76 ± 2.22 preoperatively, 2.00 ± 2.67 at 1 year, and 3.67 ± 2.24 at 2 years. In the DWB group, the mean VAS score was 5.11 ± 2.98 preoperatively, 2.40 ± 2.88 at 1 year, and 2.13 ± 2.23 at 2 years. In the EWB group, the mean AOFAS score was 69.65 ± 14.04 preoperatively, 87.50 ± 15.42 at 1 year, and 76.22 ± 15.91 at 2 years. In the DWB group, the mean AOFAS score was 67.32 ± 16.94 preoperatively, 74.20 ± 14.12 at 1 year, and 80.38 at 2 years. Results at 6 weeks, 3 months, and 6 months similarly showed no statistically significant differences.

CONCLUSION: We demonstrate that in our patient population, EWB and DWB after arthroscopic microfracture for talar OCLs < 1.5mm2 demonstrate no statistically significant difference in VAS or AOFAS scores. This study suggests that delayed weightbearing may be unnecessary after microfracture for OCLs of the talar dome.

CLINICAL RELEVANCE: This study supports early weightbearing after arthroscopic microfracture for OCLs of the talar dome.

###
The Reliability of Kager’s Triangle in Detecting Acute Achilles Tendon Ruptures

CPT Mitchell C. Harris, M.D.
MAJ Kevin P. Krul, M.D.
CAPT Claude D. Anderson M.D.
LTC Paul M. Ryan M.D.
Tripler Army Medical Center
Department of Orthopaedics

INTRODUCTION: An acute Achilles tendon tear is common in the general military population. Unfortunately, misdiagnoses may delay treatment and complicate surgical outcome. As the history and physical can be subtle, the use of readily available adjunctive studies is important to the practitioner. Obscuration of Kager’s triangle has been described as a radiographic sign of Achilles tendon rupture, however the sensitivity of this finding is poorly reported.

METHODS: A retrospective review of electronic patient medical records of 50 consecutive patients who underwent acute Achilles tendon repair with lateral ankle radiographs taken within 3 days of injury. A control group was created using 50 consecutive patients who underwent other foot and ankle procedures by a single surgeon for chronic problems not involving the Achilles tendon. Radiographs and patient medical records were de-identified. Two fellowship trained foot and ankle surgeons were blinded to the diagnosis and separately reviewed and recorded their findings.

RESULTS: Radiographs for 100 ankles, 50 with Achilles tendon tears verified in surgery and 50 with other chronic soft tissue tears were reviewed. In total the mean sensitivity of Kager’s triangle for the detection of an Achilles tendon tear was 87%. The mean specificity was 80.5%. The two reviewers agreed on the presence or absence of Kager’s triangle 80% of the time for an inter-observer reliability of 0.76.

CONCLUSION: Blunting or obscuration of Kager’s triangle provides a reliable and simple method of detecting an acute Achilles tendon rupture for a trained orthopaedic surgeon. To the author’s knowledge this is the first report of blinding of the surgeon when reading radiographs of Achilles tendon tears. The ability to use this as a screening tool for difficult physical exams, for telemedicine in remote areas, or as an adjunct to advanced imaging can avoid costly secondary studies or evacuations and improve the detection of tears at the point of care.
Epidemiology of Collegiate Women’s Beach and Indoor Volleyball Injuries at a Single Center; with a Comparison of Injuries Between Beach and Indoor Volleyball Injuries

Elizabeth Ignacio, MD, Alexander Garber, MD, Christopher Lau, MD, Ian Hasegawa

BACKGROUND: The NCAA first sanctioned women’s beach volleyball in 2012. Since then, according to the NCAA, women’s beach volleyball has been the fastest growing NCAA sport with 50 colleges and universities sponsoring it as of January 2015. From 2012 to 2015, the University of Hawaii has accumulated game and practice injury data for women’s beach volleyball.

OBJECTIVE: To review (i.e. evaluate and compare) the University of Hawaii injury data collection system from 2012 to 2015 (2016?) for the incidence of sports injuries in women’s collegiate volleyball athletes, comparing indoor and sand volleyball injuries, and to identify potential areas for injury prevention initiatives. Upon recent literature review, there has been no prior study comparing injuries sustained in women’s beach and indoor volleyball from a single institution.

METHODS: Injury collection data from a single institution (University of Hawaii at Manoa) was retrospectively reviewed, reviewing for presence and type of injury, season of injury (pre-, in-, or post-), treatment, and time of withdrawal. Data were analyzed with graphs and tables of injury prevalence by sport (indoor vs sand), age, site of injury (body location). We also analyzed the average time of withdrawal of athletes.

MAIN RESULTS: Currently pending, but most injuries are related to repetitive jumping and overhead hitting. The ankle is the most commonly injuries joint, but the knee, hip, lower back, shoulder, and fingers are also at risk during play.

CONCLUSIONS: Pending.

RECOMMENDATIONS: Pending. Currently level IV evidence, epidemiological study.
Long-Term Follow-up of Arthroscopic vs. Open Anterior Shoulder Stabilization Procedures

Johnson J, Shaha J, Raybin S, Zhou L, Bottoni CR

**BACKGROUND:** Recurrent shoulder instability following primary repair of Bankart lesions is well-documented in the literature. This aim of this prospective, randomized study was to evaluate clinical outcomes of arthroscopic and open Bankart repairs using 13-15 year follow-up data.

**METHODS:** We randomized 65 consecutive patients to either open or arthroscopic labral repair between 2001 and 2002. All cases were performed by a single sports medicine fellowship-trained orthopaedic surgeon at our institution. Demographic variables, Western Ontario Shoulder Instability (WOSI) scores, Simple Shoulder Test (SST) scores, Single Assessment Numeric Evaluation (SANE) scores, and the rate of surgical failure (defined as > 1 re-dislocation event post-operatively) were collected both pre-operatively and post-operatively at the 13-15 year mark.

**PRELIMINARY RESULTS:** The mean age at surgery was 25.1 years (range 19-42 years), and the mean follow-up was 14 years (range 13-15 years). The overall mean WOSI score was 672 (560 for open group, 739 for arthroscopic group), the overall SANE score was 73.5 (75 for open group, 72.6 for arthroscopic group). There were 2 dislocations in both the open and arthroscopic groups.

**DISCUSSION & CONCLUSION:** We demonstrate that in our active patient population, arthroscopic and open shoulder stabilization surgery yield comparable long-term outcomes, with no statistically significant differences in WOSI, SAE or SST scores, or in surgical failure rates. This study reaffirms that arthroscopic Bankart repair is a suitable technique for operative management of anterior shoulder instability.
Occupational Outcomes of Reconstructive Surgery for Adult Acquired Flatfoot Deformity

Michael Finnern Jr, M.D., Paul Ryan, M.D., Claude Anderson, M.D.

BACKGROUND: Reconstruction of a symptomatic adult flatfoot is an involved operation with a long recovery period. No previous studies have looked at the occupational or functional results of athleticism active patients who have undergone this surgery. In the United States Military, the rates of return to un-restricted active duty are unknown.

METHODS: A retrospective review of all active duty military patients who underwent a reconstructive surgery for adult acquired flatfoot surgery at a single institution from January 2001-2015 was performed. Surgical, inpatient, and outpatient databases were searched via CPT and ICD9 codes. Approximately 1300 cases with potential flatfoot reconstructive surgery were identified. Only those patients with the diagnosis of flatfoot treated with both a boney procedure and a soft tissue procedure were included. Patients had to have at least one year follow-up or follow-up to the point of maximum medical benefit as defined by the operative provider. Final disposition of the patients had to have been recorded in the medical record. Three possible outcomes were utilized in the review of this cohort: patient returned to duty without restrictions, patient returned to active duty with restrictions, or patient separated from active duty due all or in part to this medical condition.

RESULTS: Twenty-three patients met inclusion criteria. One of 23 patients (4.3%) returned to full duty without restrictions and 65.2% (12/23) were given permanent duty restrictions. 30.4% (10/23) underwent a Medical Evaluation Board (MEB) to separate from the military.

CONCLUSIONS: The sample size, while small, is the largest study to date of young active patients who underwent surgical correction for symptomatic pes planus. The results demonstrate that a service member with symptomatic pes planus requiring surgery faces a 96% chance of failure to return to his or her pre-injury level of function. Furthermore, while some patients (65%) were able to remain on active duty with restrictions, there is a 30% chance that service members will face separation from the military due to their foot pain despite a year of surgery and recovery.

###
Redefining Optimal Medullary Canal Fill in Flexible Intramedullary Nailing of Pediatric Femur Fractures

James S. Shaha, MD; J. Matthew Cage, DO; Sheena R. Black, MD; Robert L. Wimberly, MD; Steven H. Shaha, PhD; Anthony I. Riccio, MD
Childrens Medical Center / Texas Scottish Rite Hospital for Children, Dallas, TX

PURPOSE: To assess the relationship between percent canal fill and alignment at radiographic union following flexible intramedullary nailing (FIMN) of pediatric femoral shaft fractures.

METHODS: An IRB approved, retrospective review of a consecutive series of patients who sustained a femoral shaft fracture treated by retrograde, stainless steel FIMN was performed at a single level 1 pediatric trauma center from 2005-2012. Medical and surgical records were reviewed and preoperative radiographs were analyzed to determine fracture pattern, fracture location, and isthmic canal diameter. Percent canal fill was calculated using the known nail diameters and the measured isthmic diameter. Radiographs at the time of bony union were reviewed to measure shortening, coronal angulation and sagittal angulation. Canal fill was analyzed to determine correlative factors and radiographic outcome with significance defined as p<0.05.

RESULTS: 274 children underwent retrograde FIMN at an average age of 8.3 years (range, 2.2-17.1 years). Canal fill of >80% was seen in 108 (39.4%) patients. When compared to those with <80% canal fill, there were no significant differences in age (8.8 vs. 7.9 years), gender (76.8% vs. 71.1% males), or BMI (18.5 vs. 17.2 kg/m2). There were significantly more length unstable fractures in the <80% canal fill group (49.3% vs. 29.6%, p<0.01). Radiographic outcome was no different with respect to coronal angulation (2.6 vs. 3.0 degrees), sagittal angulation (3.0 vs. 3.1 degrees), or shortening (2.4 vs. 4.0 millimeters). Canal fill of >70% was seen in 185 (67.5%) patients and when compared to the <70% canal fill group, there were no differences in shortening (3.2 vs. 3.8 millimeters), coronal angulation (2.7 vs. 3.0 degrees) or sagittal angulation (2.9 vs. 3.3 degrees). Finally, 7.5% of the population (20 patients) had less than 60% canal fill and did not demonstrate a significant increase in shortening, coronal or sagittal angulation compared to groups with higher percentages of canal fill. No group had an increased rate of infection, implant removal, nonunion or need for reoperation.

DISCUSSION: In a large series of consecutive patients treated with retrograde stainless steel FIMN there does not appear to be any correlation between the percent of canal fill and radiographic outcome. This calls into question the generally agreed upon principle that optimal canal fill of >80% is necessary for a successful result.

SIGNIFICANCE: Stainless steel flexible IM nails are able to maintain fracture alignment without an increase in complications at lower percentages of canal fill than previously reported as “optimal”.

###
Radiographic Outcome of Operative Treatment For Spinal Deformity In Patients With Syringomyelia: A Comparison Study to Adolescent Idiopathic Patients

Sean Brugman, MD

BACKGROUND: Syringomyelia associated scoliosis (SAS) is relatively uncommon and there is only sparse literature discussing fusion levels in severe cases and fusion levels have traditionally been based on adolescent idiopathic scoliosis (AIS) curve selection criteria. A few reports have observed curve progression in the SAS group with the suggestion that fusion levels be extended in this group. Due to the rare occurrence of this pathology, these reports are small and retrospective. This study is the first to compare this group of patients to adolescent idiopathic scoliosis and the largest series to date.

HYPOTHESIS: Using similar fusion level selection criteria curve progression will not significantly differ between operatively treated SAS and AIS patients

STUDY DESIGN: A retrospective cohort study, level 3 evidence.

METHODS: A retrospective review was conducted to identify all SAS patients with radiographs available for review at a single institution and matched by curve type and magnitude in a 1:2 ratio with AIS patients. Demographic data, previous syrinx surgery and complications were also obtained. The choice of distal fusion level was established using AIS criteria in all cases. Pre-operative and post-operative radiographs were assessed for curve progression in the coronal and sagittal planes.

RESULTS: 61 SAS patients and 115 AIS patients were identified and matched. There were more male patients in syringomyelia-associated scoliosis (34% vs 14.4%, p= 0.01). Syringomyelia-associated curves were stiffer on bending films, more often had a convex thoracic apex to the left (p<0.001), and had more thoracic kyphosis (p<0.001). Distal fusion levels were similar in both groups. Proximal fusion levels were more proximal in the SAS group (vertebrae level 2.9 vs 3.6, p=0.003). Percentage of curve correction was similar in both groups immediate post-operatively and at two years. Complication rates including curve progression were similar between the two groups.

CONCLUSION: Treatment of syringomyelia-associated scoliosis has a high likelihood of satisfactory outcome at 2 years when fusion levels are based on adolescent idiopathic principles. This was despite the fact that the syrinx patients had stiffer curvatures and more thoracic kyphosis.

###
Are Ultrasounds and Clinical Exams as Effective as MRIs in Assessing Tendon Approximation of Achilles Tendon Tears? A Clinical Study

John Johnson, MD

INTRODUCTION: Studies have attempted to clarify which acute Achilles tendon tears are amenable to nonoperative intervention by determining the amount of gapping at the rupture site on ultrasound. To our knowledge, no studies have attempted to determine the reliability of ultrasound and clinical exam in determining said gapping. The purpose of this study is to determine if ultrasound and clinical exam are reliable, as compared to MRI, in determining tendon approximation of acute Achilles ruptures.

METHODS: A retrospective review of consecutive patients presenting with a diagnosis of acute (<3 weeks) Achilles tendon rupture over a 1 year period were included. Patients were excluded if the tear was subacute (3-6 weeks) or chronic (>6 weeks), or if they had a known diagnosis of tendinosis/tear. Tears were diagnosed by physical examination. Each patient was then evaluated via the orthopedist by ultrasound and palpation to determine the plantarflexion angle at which complete approximation of the tendon ends occurred. A dorsally-based, short-legged splint was placed at this degree of equinus and an MRI was performed to assess for any residual gapping. Other variables considered included mechanism of injury, age, sex, X-ray findings, amount of residual gapping (if any), and time from presentation to exam/imaging.

RESULTS: Eighteen consecutive patients were included from 2014-2015. The average age was 36 years and 16/18 were male while 13/18 were right-sided. All injuries occurred from an athletic event with basketball being the most common. Diagnoses were made by clinical exam as palpable defects, positive Thompson’s squeeze tests, positive Matle’s test, and/or inability to actively plantarflex the ankle. Average equinus for splinting at which exam and ultrasound suggested approximation was 41 degrees (range 20-55). MRI’s were obtained at an average of 1.3 days post-injury in all patients. 10/18 (56%) patients demonstrated persistent gapping on MRI at an average of 2.0 cm (range 0.5-3.4 cm). The average time to MRI of gapped patients was 0.9 days while the average time to MRI of those without gapping was 1.8 days.

CONCLUSIONS: In over half of our patients presenting with acute Achilles tendon rupture, clinical exam and ultrasound suggesting tendon approximation did not correlate with MRI findings of approximation. This could suggest that surgeons who utilize tendon approximation on ultrasound as a decisive factor for operative versus nonoperative intervention may not be adequately assessing tendon gapping.

###
CME Requirement: Evaluation Form

In order to receive CME credit,
symposium participants must complete an online SurveyMonkey evaluation form.
Please see Cathy Iwai for details on how to access the form.

Mahalo for attending the
31st Annual Combined Orthopaedic Spring Symposium!