

of the right wrist and forearm were negative for fracture. She was diagnosed with wrist extensor tendonitis and was recommended to stop kettlebell lifting permanently. She presented to the musculoskeletal physiatry clinic for a second opinion as she desired to continue competing. When discussing her lifting technique, the patient indicated that with each kettlebell snatch, the kettlebell fell directly onto her distal forearm; this contact worsened her pain. Physical exam revealed right dorsolateral forearm tenderness with a focal palpable nodule at the distal one-third of the forearm. Right wrist passive range of motion was normal and pain-free. Pain was provoked with resisted wrist extension with radial deviation.

Setting: Outpatient musculoskeletal physiatry clinic.

Results: Bedside musculoskeletal ultrasound revealed cortical irregularity of the radius over the tender area. There was no evidence of tenosynovitis of the distal wrist extensor tendons. MRI demonstrated bone marrow edema with suspected stress fracture line at the distal one-third radial diaphysis.

Discussion: This case illustrates the ability of ultrasound to detect bony cortical changes in a case of a radial stress fracture with normal plain radiographs. The case highlights the necessity of analyzing biomechanics and form in determining the etiology of athletic injuries.

Conclusions: Musculoskeletal ultrasound is a useful tool that may help detect stress fractures in the context of negative radiographs. Proper form and technique in weight-lifting can help prevent repetitive stress injuries. Stress fractures should be considered in athletes who come into repetitive, high-velocity contact with their equipment, such as kettlebells.

Level of Evidence: Level V

Poster 193

Presentation of Humeral Arthritic Marrow Edema Mimicking Carcinoma: A Case Report

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Disclosures: Minh Phan: I Have No Relevant Financial Relationships To Disclose

Case/Program Description: 87-year-old female with history of chronic right shoulder pain, right breast cancer status post mastectomy, current left breast ductal carcinoma, CHF, colon cancer, diabetes, atrial fibrillation, dementia, and depression presented with a one year history of an unsupervised fall and worsening right shoulder pain. On physical exam, there was a large right shoulder effusion without erythema or warmth. There was shoulder joint line and subacromial bursa tenderness with limited range of motion in all planes. No palpable lymphadenopathy was noted.

Setting: Ambulatory clinic.

Results: MRI of the right shoulder revealed full thickness tears of the supraspinatus and infraspinatus, partial tears of the biceps and subscapularis, marked subacromial bursitis, and severe degenerative changes of the glenohumeral joint. There was abnormal marrow signal extending from the articular surface into the humeral shaft. Subsequent MRI of the right humerus revealed a T1 hypointense and T2 hyperintense signal abnormality from the central humeral head to nine centimeters distal, concerning for a large infiltrating lesion without evidence of pathologic fracture, expansile characteristic, or periosteal edema.

Discussion: The differential included metastatic disease, multiple myeloma, leukemia, lymphoma, or severe inflammation from arthritis causing reactive edema. Multidisciplinary tumor case review determined the most likely cause was the arthritis as her active breast disease was in the contralateral breast and responding to treatment clinically. Blood counts were normal. An injection of the right subacromial bursa with 1% lidocaine and 1ml of 40mg/ml triamcinolone provided marked improvement in her right shoulder pain.

Conclusions: The improvement in her symptoms after treatment in the absence of further disease progression suggests her presentation

was more likely secondary to inflammatory arthritic changes. Infiltrative bone marrow edema on imaging due to arthritis can appear similar to malignancy on imaging and should be carefully reviewed in the context of disease process.

Level of Evidence: Level V

Poster 194

Exercise in Non-Vascular Unilateral Amputees and Intact Limb Knee Injury

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Disclosures: Mary Caldwell: I Have No Relevant Financial Relationships To Disclose

Objective: This study investigated the exercise habits of unilateral non-vascular lower extremity amputees to ascertain adherence to American College of Sports Medicine (ACSM) exercise guidelines and any relationships to intact limb knee injuries.

Design: Cross-sectional cohort study.

Setting: Telephone/Amputees seen by the Institution.

Participants: 25 individuals (N=7, Female) 22-90 years of age (M=47) with non-vascular unilateral lower limb amputations (2 transmetatarsal/symes (TM), 13 transtibial (TT), 7 transfemoral (TF), 3 hip disarticulation (HD)) were surveyed.

Interventions: Not applicable.

Main Outcome Measures: Weekly reported exercise before and after amputation [including type, frequency, duration and intensity (based on Borg Rate of Perceived Exertion)] as well as any history of intact limb knee injuries was obtained. Data were analyzed using chi-squared and one-way ANOVA tests.

Results: 84% exercised regularly prior to amputation. These individuals were significantly more likely to exercise after amputation (90%) when compared to respondents with no history of regular exercise ($P = .043$). 68% met the recommended ACSM guidelines for cardiorespiratory (CR) exercise prior to amputation but only 48% of individuals met CR guidelines after amputation and, of those, 41.7 % reported sustaining intact limb knee injuries (there were no injuries in those not meeting CR guidelines) ($P = .009$). 16% of subjects met ACSM resistance guidelines post amputation. Respondents who met CR guidelines at average or above average level were at significantly higher risk of knee injury ($P = .051$). Also, those engaged in greater than moderate intensity CR exercise had significantly higher rates of intact knee injury compared to those exercising at low or moderate intensities ($P = .014$). Level of amputation was not a significant factor for injury or participation in regular exercise.

Conclusions: This study suggests that engaging in an exercise routine at or above ACSM CR guidelines may significantly increase the risk of intact limb knee injury in individuals with unilateral lower extremity amputations. Additional investigation is needed to further explore this relationship and the implications for physical activity in this population.

Level of Evidence: Level IV

Poster 195

A Pilot Study of Resistance Exercise Targeting the Neck in Youth Athletes

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Objective: Greater neck strength may be associated with a lower risk of sport related concussion. However, the effect of resistance exercise for the neck in youth athletes is unknown. The purpose of this pilot study was to determine the effect of an 8-week supervised manual resistance training program on neck strength and head kinematics following standardized impulsive load application to the head in youth athletes.

Design: Clinical trial.

Setting: University-based biomechanics laboratory and community-based exercise facility.

Participants: Seventeen youth athletes (14.8±1.8 years, 15 males) were allocated into intervention (n=13) and control (n=4) groups using weighted block randomization.

Interventions: All participants completed 16 whole-body resistance training sessions over an 8-week period with a Certified Strength and Conditioning Specialist. In addition, the intervention group also performed dumbbell shrugs and manual resistance exercises targeting the neck.

Main Outcome Measures: Before and after the exercise program, each participant completed laboratory-based assessments of neck strength (N) and head kinematics following standardized impulsive loading in flexion, extension, lateral flexion, and axial rotation (changes in linear velocity, ΔV [m/s] and angular velocity, $\Delta \omega$ [°/s]). Descriptive statistics were calculated to compare pre-post changes between the two groups.

Results: Across all planes of motion, the neck's mean force generating capacity increased 13.7 N in the intervention group and 5.3 N in the control group; the largest between-group difference in strength gain occurred in extension (intervention group: +28.2N; control group: -2.0N). Across all planes of motion, ΔV and $\Delta \omega$ decreased similarly between the two groups (intervention group: $\Delta V=-0.1$ m/s, $\Delta \omega=-10.9^\circ$ /s; control group: $\Delta V=-0.1$ m/s; $\Delta \omega=-10.0^\circ$ /s).

Conclusions: In this pilot study involving male and female youth athletes, an 8-week manual resistance training program led to greater increases in neck strength than a control resistance exercise program, but similar decreases in the magnitude of head kinematic changes following impulsive loading.

Level of Evidence: Level II

Poster 196

Brain Injury as a Consequence of Routine PRP Protocol in a Patient on Chronic Antiplatelet Therapy

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Disclosures: Prathap Jayaram: I Have No Relevant Financial Relationships To Disclose

Case/Program Description: A 59-year-old man with lateral epicondylitis underwent ultrasound guided platelet rich plasma (PRP) and developed multiple cerebral micro-emboli 10 days post injection.

Setting: Outpatient Sports/MSK clinic.

Results: The patient had a history of grade 3 mitral valve prolapse and was being treated with daily 324mg aspirin. The PRP protocol required being off aspirin 1 week prior to the injection and 3 weeks following the treatment. The patient chose to undergo the PRP injection without disclosing the lack of clearance from his cardiologist. No immediate post injection complications occurred. However, on day 10 post injection he developed light headedness, which progressed to anxiety, paranoia and erratic behavior by post injection day 18. He took an 81mg ASA and after 30 minutes his symptoms diminished. The next

morning anxiety and paranoia recurred so he visited an ER. Work up including brain CT, CBC, troponin level, chest x-ray and ECG were all normal. An MRA ordered by another neurologist revealed 8 cerebral micro emboli. Clopidogrel was prescribed. The patient improved but residual cognitive difficulties persisted.

Discussion: Studies suggest chronic anti-platelet therapy impairs platelet activation and therefore it is recommended that antiplatelet medications be discontinued prior to PRP therapy. This case highlights the complexity of PRP treatment when someone has been on chronic antiplatelet therapy. No study to date has examined the efficacy of PRP with chronic-antiplatelet therapy.

Conclusions: This is the first case report to show an adverse response with autologous PRP associated with the cessation of chronic anti-platelet therapy.

Level of Evidence: Level V

Poster 197

Unique Presentation of Chronic Hip Pain in a Long Distance Runner: A Case Report

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Disclosures: Samuel Dona: I Have No Relevant Financial Relationships To Disclose

Case/Program Description: A 23-year-old female runner presented with a four-year history of chronic right hip pain. Her collegiate cross-country career was complicated by amenorrhea. In addition, she ruptured her left plantar fascia resulting in altered running mechanics. One year later, after a strenuous weight training session, she experienced acute onset of posterior right hip pain. She continued to run through the pain, competing in several meets but eventually the pain progressed to the point where she could no longer compete. MRI of the right hip was performed and revealed ischial bursitis with proximal hamstring strain. Conservative management was continued including low impact cross training, however pain persisted. Right hip MRI arthrogram was performed and revealed questionable bone spur at the femoral head and degenerative labral tear. A trial of physical therapy provided minimal relief. She was then evaluated by orthopedic surgery with femoral head debridement and labral repair performed. She continued to experience posterior right hip and gluteal pain after surgery and was referred to psychiatry.

Setting: Multidisciplinary Outpatient Sports Medicine Clinic.

Results: Examination revealed normal gait and range of motion of the hips. Tight psoas with resisted right hip flexion in supine and weakness of the gluteus medius on resisted right hip abduction was observed. Pelvic floor exam was remarkable for tight right levator ani and obturator internus with associated tenderness to palpation on rectal and vaginal exam. Patient was referred to expert pelvic floor physical therapy with complete resolution of pain and eventual return to running activity.

Discussion: High-tone pelvic floor dysfunction may often have a variable presentation with symptoms referred to the lower back, gluteal region, groin or leg. Focused history and physical exam are essential to diagnosis and may perhaps minimize unnecessary operative management.

Conclusions: Improved awareness of pelvic floor dysfunction by health care providers may reduce impairment and disability of those affected.

Level of Evidence: Level V