DISTAL THIRD HUMERAL FRACTURE IN A COLLEGIATE FOOTBALL PLAYER
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AN ORBITAL FLOOR FRACTURE IN A COLLEGIATE DIVING ATHLETE
Curtis, SM, Pallone, AS, LeDuc, JR & Fitzsimmons, KP: Trinity College, Hartford, CT & Elite Sports Medicine, Farmington, CT

INSIDIOUS ONSET OF A PERIUMBILICAL LYMPH NODE IN A MALE COLLEGIATE ROWING ATHLETE
LeDuc, JR, Curtis, SM, Pallone, AS & KP, Fitzsimmons: Trinity College, Hartford, CT & Elite Sports Medicine, Farmington, CT

BILATERAL DEEP POSTERIOR CHRONIC COMPARTMENT SYNDROME IN A COLLEGIATE VOLLEYBALL ATHLETE: A CLINICAL CASE STUDY
Peterson TD, Hartsell, HL: Barton College, Wilson, NC

LOWER RIGHT QUADRANT PAIN IN A COLLEGE FEMALE
Joyner, KM, Scifers, JR & Manners, JA: Western Carolina University, Cullowhee, NC

ANKLE INJURY IN A HIGH SCHOOL PERFORMING ARTIST
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Objective: To present a case study of a collegiate football player who sustained a distal third humeral fracture while tackling in an intercollegiate football game. Background: A 22 year-old male football defensive back complained of immediate pain and loss of mobility of the elbow after tackling an opponent during a collegiate football game. The initial sideline exam was remarkable for the degree of immediate swelling and pain. There was tenderness to palpation from the mid-humerus throughout the elbow, with a questionable deformity at the elbow joint. He was unable to flex or extend the elbow actively. Additionally there was crepitus to palpation at the medial distal humerus. There was no tenderness at the forearm, and no sensory deficits noted in the affected extremity. Differential Diagnosis: Elbow dislocation, ulnar collateral ligament tear or fracture of the distal humerus. Treatment: The team orthopedist performed a sideline evaluation, and the injury was initially diagnosed as a posterior elbow dislocation. Traction and distraction force was applied to reduce the elbow joint, which brought some temporary relief. However, the patient continued to have pain and crepititation with any attempted movement. The arm was placed in a sling, and the athlete was taken to the mobile x-ray unit on site. Radiographic images showed a distal diaphyseal fracture of the humerus. The athlete was placed in a posterior plaster splint and sling. Due to the location of the fracture and degree of angulation, the decision was made to perform an open reduction and internal fixation. The athlete wore a sling and posterior splint post-surgery for 2 weeks followed by a humeral brace with the sling for 6 weeks. The brace was then removed, and the athlete was permitted to start elbow ROM exercises and strengthening of the hand, wrist and forearm muscles. At the 10-week mark the athlete had full ROM of the upper extremity and was permitted to discontinue using the sling. Over the next 8 weeks, a controlled rehabilitation program was performed which involved light dumbbell activities, tubing resistance exercises, plyometric ball activities, and proprioceptive exercises. Following this time period, the athlete was permitted to return to football related activity with protective padding but was not permitted to engage in any contact drills during Spring Football. Uniqueness: A review of literature revealed no articles relating specifically to distal third humeral fractures in collegiate football players. This injury pattern is also called a Holstein Lewis fracture. The danger of any fracture to the distal humerus is injury of the radial nerve or artery, and this is particularly true of distal third fractures. Most authors split between conservative and surgical management of distal third humeral fractures. Surgical management with plating is recommended when radial nerve palsy is apparent or when that the fracture site appears unstable. Conclusions: This case demonstrates the necessity of prompt recognition and treatment of an unusual fracture of the distal humerus, and that fracture must be in the differential diagnosis of traumatic elbow injuries. One should be aware of the potential for neurologic and vascular complications in distal humeral fractures. Appropriate rapid intervention, and a graded rehabilitation program can avert potential long-term complications and allow return to high-level athletics. The athlete at this time is asymptomatic and has returned to all athletic and daily living activities. Key Words: Diaphyseal, Humerus Fracture, Holstein Lewis Fracture, Radial Nerve Palsy
AN ORBITAL FLOOR FRACTURE IN A COLLEGIATE DIVING ATHLETE

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Objective: The objective of this case study is to educate athletic trainers on the signs and symptoms of an orbital floor fracture, particularly when the athlete presents with an atypical mechanism of injury. Background: The athlete is a 21 year-old collegiate diver who had an erratic dive off the three-meter springboard during practice. Immediately following facial impact with the water, he presented with classic symptoms of a concussion including headache, vertigo, nausea, photophobia and general malaise. He did not present with or complain of amnesia, nystagmus, auditory or olfactory abnormalities, facial numbness or abnormal ocular tracking. Upon palpation, he did have mild pain over the left maxillary sinus bone, as well as, diffuse facial pain. He was held in observation in the athletic training room for approximately thirty minutes, at which time most of his symptoms resolved with the exception of his headache and diffuse facial pain. At this time, he was removed from further activity and scheduled a follow-up with the Certified Athletic Trainer the next day. The following morning, he presented with new symptoms of “added pressure” along his right maxillary sinus and dysesthesia along the right side of his nose following the infraorbital nerve distribution, a branch of Cranial Nerve V. The pain along the left side of his face had resolved. He was then referred the team physician for further examination and diagnostic testing. During the examination, the athlete noticed that when he blew his nose he felt “a bubbling sensation” and crepitus in the periorbital tissue on the right side. Initial impression at this time was a right maxillary sinus fracture with infraorbital nerve palsy. Differential Diagnosis: orbital floor fracture, zygomatic arch fracture, facial contusion. Treatment: Based on his physical examination and current symptoms, it was determined that he would benefit from a computed tomography (CT) scan. The CT scan was positive for a right orbital floor fracture with boney depression and also a mucous retention cyst in the right maxillary sinus. An oral maxillary facial specialist was consulted and it was determined that surgical correction was not required at this time. Instead, the athlete was withheld from participation in swimming and diving and would refrain from blowing his nose for twelve weeks. Currently, the athlete has fully recovered and has not had any complications from the injury. Uniqueness: Orbital floor fractures are usually a result of blunt force trauma and common symptoms include diplopia, impaired extraocular motility, enophthalmos (sunken globe), epistaxis and ecchymosis. This athlete did not present in that manner. Since the initial impression of the injury was incorrect, re-evaluation, prompt follow-up care and the use of diagnostic testing was critical in establishing a proper diagnosis. Conclusion: Diving is considered a non-contact, low risk of injury sport where the threat of fractures is low. However, it is important to remember that the mechanism for an orbital floor fracture is not limited to the traditional impact with a solid object or projectile. Impact with water can indeed cause a significant change in orbital pressure which can result in the disruption of the orbital socket. In this case study, what originally appeared to be a typical injury, a concussion, turned into an unexpected injury with atypical symptoms. Key Words: orbital floor fracture, maxillary sinus fracture, infraorbital nerve.
Objective: The objective of this case study is to educate athletic trainers in recognizing the symptoms and identifying the potentially serious causes of an abdominal mass of insidious onset. Background: A 21 year-old male collegiate rowing athlete reported to the athletic training room complaining of a peculiar mass approximately 1-cm round and approximately 1.5-cm superior to his umbilicus which he noticed a few days prior. He denied any specific mechanism of injury. According to the athlete, the mass had not increased or decreased in size. Present medical history of the athlete remained unremarkable. He denied any illnesses, fever or chills, weight loss or weight gain, decrease in appetite, change in bowel or bladder habits, nausea or vomiting and lastly he denied any abdominal discomfort. Physical examination by the Certified Athletic Trainer was unremarkable. Trunk range of motion, strength and sensation was within normal limits. Past medical history revealed a similar lesion within the last 2 years however the athlete believed it to be smaller in size and did not seek treatment for it. Initial impression was a potential abdominal hernia. Differential Diagnosis: benign tumor, infection, cancer particularly of the bladder or gut, Hodgkin’s disease, Leukemia, and Tuberculosis. Treatment: Due to the unexplainable cause for this mass, the athlete was referred to the team physician for a more detailed examination. Physical examination by the team physician revealed a soft, nontender and nondistended abdomen with normal bowel sounds. There was no hepatosplenomegaly. Palpation revealed a mildly tender and movable lymph node superior to the umbilicus. A palpable node in this region has often been called a Sister Joseph’s Nodule. The sports medicine staff felt that this mass should be monitored closely and several diagnostic tests should be ordered. First, a computed tomography (CT) scan with contrast of the abdomen and the pelvis was performed followed by blood work with a complete blood count with differential to check liver and kidney function and to screen for an underlying infection. The CT scan revealed no abnormalities and the blood work was within normal limits. The diagnosis at this time is a benign periumbilical lymph node. Uniqueness: Typically, periumbilical lymph nodes are associated with an infection or an underlying disease. Even though an umbilical nodule is often associated with a malignant process, it may also be associated with nonmalignant conditions that produce benign tumors or prominent lymph nodes. Fortunately, for this athlete his mass has been determined to be benign and even though it is still present at this time, it is not a cause of concern for the sports medicine staff. However, there still is no explanation for the development of the mass. He currently has no restrictions on sport participation. Conclusion: This situation shows the importance of quick follow up care and the need for diagnostic testing. Had this mass been an early sign of a serious disorder, the athlete would have received the correct care. Prominent periumbilical lymph nodes are not a common condition an athletic trainer would see in a sports medicine setting. Yet, it is important to be conscious of and to be aware of the possible underlying causes for the condition. Key Words: lymph nodes, Sister Joseph Nodule.
BILATERAL DEEP POSTERIOR CHRONIC COMPARTMENT SYNDROME IN A COLLEGIATE VOLLEYBALL ATHLETE: A CLINICAL CASE STUDY
Peterson TD, Hartsell, HL: Barton College, Wilson, NC

Objective: To inform others that compartment syndrome can present in any athlete and continued testing may be necessary to finalize the diagnosis. Background: An 18 year old female volleyball player first reported to ATC after having severe pain in both calves. Pain was located at the musculotendinous junction of the calf moving superiorly toward the mid calf region. Athlete reported pain to be the worst during any exertional activity and soreness could last into the next day. Athlete stated that in the evening she would experience leg cramps just sitting or lying in bed. Athlete continued with her season however pain increased and symptoms worsened as time went on. Pain began to be evident during activities such as lifting, calf raises, and jumping. Athlete did have some complaints in high school but indicated it was tolerable and more intermittent. Original diagnosis was chronic cramping and spasm. Differential Diagnosis: Muscle Cramps, Muscle Strain, Superficial Posterior Compartment Syndrome, Deep Posterior Compartment Syndrome, Stress Fracture, and/or Shin Splints. Treatment: Athlete was treated with ice before, during, and after practices and games, depending on the intensity of pain and tightness. She was also stretched as needed. Heat was not used prior to activity because athlete reported it would make her symptoms worse and occur more rapidly. It was recommended by a physician for her to start taking a multivitamin, mustard shots, quinine water and then possible lab work. Athlete continued with previously stated treatments to get her through the season. She was seen by a physician in the spring of 2007 for possible compartment syndrome. The clinical exam was benign and no reproduction of symptoms occurred so athlete was not tested. She continued with sub-maximal workouts throughout spring and summer as tolerated. In the fall of her second competitive season, athlete continued to have episodes of tightness, pain, and symptoms that would remove her from competition. Ice and stretching treatments continued before and after activity or when symptoms appeared. After two weeks, treatments shifted to heat and ultrasound for thermal effects before activity, and continued with cryotherapy when the symptoms arose. Athlete stated she felt looser and stronger with heat before, however she reported similar episodes as the previous year. Athlete was therefore referred back to the physician at the beginning of September where he performed an intracompartmental pressure test in the posterior compartment. The results were negative, however, swelling and hardness were witnessed in her lower legs after the exertional test. She was then referred to a Lower Leg Specialist. Initially the specialist ordered the athlete to have a bone scan to rule out injuries such as stress fractures and shin splints. The results were negative. Athlete returned to the physician in mid-October where an intracompartamental pressure test was performed specific to the deep posterior compartment. These results were positive for increased pressure after exertion. Athlete completed season to the best of her ability. In December, athlete had bi-lateral fasciotomy of the deep posterior compartment. Post surgery athlete began basic rehabilitation which has progressed over the last three months. Uniqueness: While deep posterior compartment syndrome is second in occurrence to anterior compartment syndrome, it is most often seen in aerobic athletes, including runners and soccer players. As a collegiate volleyball player, the athlete mainly participated in anaerobic activity, causing all the symptoms of chronic compartment syndrome which is not typical. This case is also unique in that the athlete’s response to treatments changed over time. Initially, as in most cases of compartment syndrome, heating the area caused more pain and more problems. After a year of treating the symptoms without heat, thermal effects began to make the area feel better, even though symptoms still were present. In addition, the athlete’s symptoms did not always resolve with cessation of activity, which is typical with compartment syndrome. Instead severe pain lasted 20-30 minutes after activity was stopped, she would often have symptoms throughout the night, and would still have effects the next day. Conclusion: Chronic Compartment Syndrome can present in anaerobic athletes as well as aerobic athletes. It can present in any of the four lower leg compartments. As athletic trainers, we need to be able to recognize all the signs and symptoms of compartment syndrome for any athlete. These may not necessarily be typical and can include muscle tightness, hardening/swelling in the leg, cramping during or after activity, and symptoms diminishing, but not necessarily resolving when activity is terminated. If symptoms continue over time persistence in testing is necessary to rule out any and all injuries. Key Words: Compartment Syndrome, Muscle Cramps, Intracompartamental Pressure Test, Anaerobic Activity, Fasciotomy.
LOWER RIGHT QUADRANT PAIN IN A COLLEGE FEMALE
Joyner, KM, Scifers, JR & Manners, JA: Western Carolina University, Cullowhee, NC

**Objective:** The purpose of this presentation is to educate athletic trainers on the importance of thorough evaluations and differential diagnoses of abdominal pain in females. **Background:** The patient is a twenty year-old female college student whose past medical history is unremarkable for abdominal pain. Initial evaluation revealed insidious onset of severe right lower quadrant pain, nausea, vomiting, cold sweats, malaise, dizziness and upper extremity tremors over a period of twenty-four hours with additional night sweats for the past week. The patient’s pain progressed from a dull ache to a sharp, stabbing pain in the right lower quadrant over the course of several hours. Evaluation by a Certified Athletic Trainer revealed right lower quadrant rigidity, rebound tenderness and pain over McBurney’s Point. The patient was referred to the local emergency room for follow-up examination and care. Initial evaluation in the emergency room revealed normal vital signs, but, increased intensity of all symptoms. An abdominal CT scan with intravenous contrast and a pelvic exam were ordered, both of which were negative. The patient was diagnosed with constipation and discharged. Following three days of continued symptoms, the patient was seen in the University Health Center for follow-up care. Physician evaluation again noted rigidity and rebound tenderness with palpation of the right lower quadrant and the patient was referred to a general surgeon for further assessment. The surgeon completed a clinical exam of the patient and scheduled exploratory abdominal surgery to rule out appendicitis. Surgical diagnosis revealed a ruptured right ovarian cyst and mild appendicitis. **Differential Diagnosis:** Appendicitis, ovarian dysfunction, urinary tract infection, ectopic pregnancy, sexually transmitted disease, pelvic inflammatory disease and gastrointestinal dysfunction. **Treatment:** Initial treatment consisted of morphine and intravenous antibiotic medications. Surgical removal of the ovarian cyst and the appendix were followed by intravenous pain medications and oral pain medication to be used as needed. The patient was discharged from the hospital with instructions to limit activity and weight lifting. Re-evaluation ten days post-op revealed resolution of all symptoms and full return to activities of daily living. **Uniqueness:** This case demonstrates a unique presentation of right lower quadrant pain with negative diagnostic testing. Although ovarian cysts are fairly common, cyst ruptures are somewhat uncommon. Additionally, the initial diagnosis of constipation due to a dependence on diagnostic testing results, despite the patient’s signs and symptoms, demonstrates the importance of considering all symptomology when completing a clinical exam. **Conclusion:** Abdominal discomfort in females can indicate a variety of causes. It is important that the Certified Athletic Trainer complete a thorough evaluation and refer this athlete quickly so that proper treatment can occur. **Key Words:** Ovarian Cyst, Appendicitis, Lower Left Quadrant Pain.
Objective: The purpose of this case study is to educate athletic trainers regarding a unique presentation of an ankle injury in a performing artist. Background: The patient is a 16-year-old female high school performer in Cirque. Cirque is a unique performance activity which mimics the famous Cirque De Sole. The performer was practicing the “Cat Drop” maneuver, a stunt within Parkour or wall running. The “Cat Drop” is performed by running up a wall, grasping the top of the wall, spinning and landing facing away from the wall. The mechanism of injury occurred during a practice session when the performer abandoned the trick midway through its completion. As a result, the patient fell approximately seven feet to the ground. The patient, as well as fellow-performers reported hearing a loud crack associated with the mechanism of injury. The patient presented to the athletic training room, demonstrating a non-weight-bearing gait and complaining of minimal pain, localized to the medial malleolus. Visual inspection revealed gross deformity of the involved ankle with minimal edema. Palpation of the medial malleolus demonstrated pain and deformity, with a palpable fracture line noted. Fracture tests, including the squeeze test, the bump test and the tuning fork test were all negative for tibia fracture. All other range of motion, strength and ligamentous stress testing was deferred at this time secondary to pain and deformity. Initial treatment consisted of ice, compression and elevation; when increased edema was noted following the initial cryotherapy session, the patient’s involved lower extremity was placed in a vacuum splint. Referral was made for plain radiographs to rule out tibia fracture. Differential Diagnosis: Differential diagnosis in this patient included ruling out tibia fracture, fibula fracture, talus fracture, medial ankle sprain and syndesmosis sprain. Treatment: Plain radiographs revealed a tri-malleolar ankle fracture with an accompanying syndesmosis sprain. Open-reduction, internal-fixation (ORIF) surgical repair was completed the following day to stabilize the medial malleolus and the distal fibula. The medial malleolus was fixedated using two screws; while the distal third of the fibula was repaired using a plate and five bone screws. The syndesmosis was also repaired during the ORIF procedure. Following surgical repair, the patient completed a four-week period of non-weight bearing gait prior to being allowed to initiate rehabilitation of the injured lower extremity. Rehabilitation consisted of progressive weight-bearing exercises, range of motion, strengthening and proprioceptive retraining of the involved ankle. The patient progressed without incident and was allowed to return to Cirque eight-weeks following the initial injury. Uniqueness: This case demonstrates a unique traumatic ankle injury in a performing artist. While tri-malleolar fractures are not unusual in patients who suffer falls from significant heights, the specific mechanism of injury associated with this injury is quite unusual. Finally, the presentation of minimal pain and edema is unusual when considering the severity of this fracture. Conclusion: The medical literature, reports only one other case study involving injuries associated with Parkour. As the practice of athletic training more commonly extends into the performing arts, clinicians should become increasingly aware of epidemiology of injuries associated with Cirque and Parkour. Specific knowledge of the biomechanics and safety requirements for various stunts can help the athletic trainer reduce the number of injuries associated with this extreme sport. Key words: Tri-malleolar Fracture, Syndesmosis Sprain, High Ankle Sprain, Cirque.