

Pediatric Clips

Common Pediatric Musculoskeletal Injuries

By Ranjana Sinha, MD



Pediatric Clips from The Children's Medical Center of Dayton are quick reviews of common pediatric conditions.

The Children's Medical Center of Dayton is the region's pediatric referral center for a 20-county area. As the only facility in the region with a full-time commitment to pediatrics, Dayton Children's offers a wide range of services in general pediatrics as well as in 35 subspecialty areas for infants, children and teens. We welcome your inquiries about services available – call 937-641-3666 or e-mail marketing@childrensdayton.org.



Experts you trust, caring for the children you love.

Each year, one in four children suffers injuries that require medical attention. Skeletal trauma accounts for 10% to 15% of all pediatric injuries.¹ It is important for the primary care physician to have a good understanding of the guidelines for pediatric skeletal injury evaluation, treatment and referral.

Often when pediatric orthopedic injuries are not diagnosed early and managed appropriately, common musculoskeletal injuries can result in long-term disabling conditions. This article will focus on four common skeletal injuries in the pediatric population.

ELBOW INJURY: SUPRACONDYLAR FRACTURE

Elbow injuries represent about 9% of all fractures in children. Supracondylar fractures represent about 41% of elbow injuries and 60% of elbow fractures.² Peak incidence in children is from 5 to 8 years. The mechanism of injury for most pediatric elbow injuries is a fall on the outstretched hand. The ligaments surrounding the elbow joint are relatively stronger than the bone (humerus), thus causing the fracture.

Symptoms include swelling, pain and decreased range of motion. Pain can be seen with pronation and supination of the forearm.

Neurovascular problems are also seen in supracondylar fractures. Based on the anatomy, the brachial artery is the most common injured artery and the anterior interosseous nerve, a branch of the median nerve, is frequently affected. Physical exam should include flexion of the distal interphalangeal joint of the index finger. Most nerve injuries are neuropraxias and often do not require treatment.

X-rays of a supracondylar fracture may show the joint to be distended with blood. The anterior fat pad becomes displaced superiorly and outward from the humerus giving the so called **sail sign**. The posterior fat pad (normally not seen on the lateral view) may also be displaced out of the olecranon fossa and visible on the lateral radiograph.¹

Treatment of uncomplicated supracondylar fractures is based on the degree of displacement. Only a nondisplaced fracture is amenable to nonoperative treatment in a long arm cast with the elbow at 90 degrees for two to three weeks. Displaced fractures are treated with closed reduction and percutaneous pinning on an urgent basis, followed by casting.²

HIP INJURY: SLIPPED CAPITAL FEMORAL EPIPHYSIS (SCFE)

In SCFE, the femoral head or ball slips off the femoral neck. It affects boys twice as often as girls. SCFE can occur bilaterally 50% of the time. The *acute slip* can result from trauma, or over a period of weeks to months, the *chronic slip*.

The exact cause of SCFE is unknown. There are several risk factors that can increase the likelihood of SCFE, such as long-term steroid use, thyroid problems, radiation therapy, chemotherapy and kidney disease. Overweight children ages 10 to 18 years of age, are also at risk. The injury is more prevalent among African-Americans.³

A common symptom of SCFE is pain in the hip that is worsened by activity. Pain can also radiate to the groin, thigh or knee area. Children often describe the leg as "giving way." The *chronic slip* can cause the child to limp and have hip pain. Rest usually alleviates the pain. Often the child walks with the affected leg (hip) turned outward.³

June 2009 • Volume 7 • Issue 3

In addition to the history and physical, imaging studies such as x-rays, bone scans or MRI may aid in diagnosis.

Treatment is based on the severity of the SCFE, child's age and overall health. In severe cases, surgery involving placement of a steel pin to prevent further slipping holds the femoral head in place. Following surgery, physical therapy helps to strengthen the hip and leg muscles.²

Early diagnosis and intervention is key to preventing hip deformity in SCFE.

KNEE INJURY: ANTERIOR CRUCIATE LIGAMENT (ACL) TEAR

The ACL is the most commonly injured ligament in the knee. An ACL tear usually occurs following an impact or abrupt stops and turns (such as in soccer, football and basketball). Female college basketball players are up to eight times more likely to sustain an ACL injury than males.⁴ Following an ACL injury, the knee can be unstable and tears can put the patient at risk for early degenerative joint disease as well as subsequent damage to other structures of the knee.

Symptoms of an ACL tear are:

- Knee swelling within 24 hours (hemarthrosis) – rule out patellar subluxation and fracture
- Patient heard or felt a pop
- Patient was unable to continue activity immediately after injury
- Patient describes the knee "gives way" or is unstable

X-rays are performed to rule out fractures. MRI is a better diagnostic modality to evaluate ligament and cartilage damage.

Research has shown that the incidence of noncontact ACL injury can be reduced anywhere from 20% to 80% by engaging in regular neuromuscular

Continued from the front.

training. This is designed to enhance proprioception, balance, proper movement patterns and muscle strength.⁴

Treatment depends on the severity of the injury as well as the age and expectations regarding activity of the patient. For young athletes, surgical repair and extensive rehabilitation is the best option.

LEG INJURY: TODDLER'S FRACTURE

Most spiral fractures occur in children less than 5 years of age. This common fracture occurs when the child is running or steps on an uneven surface and twists the lower leg. There is a sudden twisting or external rotation of the foot with the knee in a fixed position. This creates a torsional force that leads to a spiral fracture of the tibia without involvement of the fibula.

Symptoms are pain (often on dorsiflexion), limp or refusal to walk, and minor swelling or warmth over the fracture.

Radiographic signs are subtle and may only be seen on an internal oblique view of the lower extremity. The fracture site may only be visible as healing begins and new bone is formed.

Healing is rapid and treatment is a long leg cast followed by a short leg cast, both for two to three weeks.

SUMMARY

Musculoskeletal injuries are frequently seen by the primary care physician. Many of these injuries heal with rest, ice and anti-inflammatory medications. Radiographic imaging may or may not aid in early diagnosis. It is the provider's responsibility to determine if further diagnostic imaging and specialty consultation or referral is warranted.

Many musculoskeletal injuries in pediatrics are specific to the child's age and mechanism of injury. Recognizing these in the history, performing a careful physical

examination and proper evaluation may prevent long-term complications.

REFERENCES

1. **Common Disorders.** 2008. Available at <http://www.childrensorthopaedics.com>
2. **Common Traumatic Injuries of the Pediatric Elbow.** 2003. Available at <http://uwmsk.org>
3. **Slipped Capital Femoral Epiphysis.** 2007. <http://www.stamfordhospital.org>
4. **Padra, Darin.** 2004. **Anterior Cruciate Ligament (ACL) Injury Prevention.** ACC Sports Sciences.
5. **Ballas MT, Tytko J, Mannarino F.** 1998. **Commonly Missed Orthopedic Problems.** American Family Physician.
6. **Halsey ME, Finzel K, et al.** **Toddler's Fracture: Presumptive Diagnosis and Treatment.** 2001 *Journal of Pediatric Orthopedics.*

FEATURED SPECIALIST



RANJANA SINHA, MD, is the medical director for Urgent Care – Springboro at The Children's Medical Center of Dayton. Dr. Sinha received her medical degree from the Medical Academy of Lublin in Lublin, Poland. She completed her pediatric residency at Bridgeport Hospital/

Yale University School of Medicine in New Haven, Connecticut and Cincinnati Children's Hospital Medical Center. Dr. Sinha is board certified in pediatrics.

URGENT CARE AT DAYTON CHILDREN'S

Dayton Children's urgent care centers provide acute episodic nonemergent medical care to children from birth through 21 years of age. Our two locations are the only urgent care centers staffed by pediatricians from Dayton Children's regional pediatric trauma and

emergency center. Urgent Care – Springboro is located inside the new Outpatient Care Center – Springboro, conveniently located off Route 741. Specially trained pediatricians are available in the urgent care center Monday through Friday, 3:00 pm to 10:00 pm and Saturday and Sunday, 11:00 am to 8:00 pm. Short wait times and free parking make visits easy for parents and families. For more information, call Dayton Children's Urgent Care – South at 937-641-5725.



For further information about The Children's Medical Center of Dayton or its specialists contact us at 937-641-3666 or marketing@childrensdayton.org.



One Children's Plaza
Dayton, Ohio 45404-1815

Nonprofit Organization
U.S. Postage Paid
Permit Number 323
Dayton, Ohio