

## ***PHYSEAL INJURIES*** **(GROWTH PLATE INJURY)**

### **DESCRIPTION**

The growth plate is a cartilage structure near the end(s) of bone. Bones grow in length from the cartilage production of the physis followed by calcification of the cartilage. Most growth plates close (fuse or disappears) in females by 14 - 16 years of age and by 16 - 18 years of age in males (though some growth plates close as late as 25 years of age).

The growth plate is the weak link in the growing athlete. Thus, the growth plate is more likely to be injured than bone, muscle or ligaments. Due to the increased blood supply at the growth plate, it is also more susceptible to infection in athletes and non-athletes.

Fractures involve the growth plate and may include a piece of bone whereas acute ligament-type injuries and/or overuse muscle-tendon type injuries are associated with the growth plate becoming inflamed (in overuse injuries) and/or separating from the underlying bone and being pulled off (avulsion fracture) with or without bone.

### **FREQUENT SIGNS AND SYMPTOMS**

- Pain, tenderness, bleeding, bruising and swelling at the fracture site
- Weakness and inability to bear weight on the injured extremity
- Weakness or inability to use the injured extremity in athletic activities
- Paleness and deformity (sometimes)
- Loss of pulse, numbness, tingling, and/or paralysis below the fracture site (usually an extremity) - These are Emergencies

### **CAUSES**

- Injury or sudden strain causing a force greater than the growth plate can resist.
- Chronic repetitive stress and strain and/or overuse to muscles and tendons
- Sudden increase in amount or intensity of activity
- Muscle imbalance or weakness may predispose.

### **EXPECTED OUTCOME**

Usually curable with skillful first aid and after care. Healing time varies. May require surgery.

### **POSSIBLE COMPLICATIONS**

- Failure to heal (non-union).
- Healing in poor position (mal-union).
- Shock from blood loss (rare)
- Death of bone cells due to interruption of the blood supply.
- Weakness of muscle force if muscle-tendon attachment pulled off and not replaced in proper position
- Shortening or deformity of the fractured bone
- Complete or partial arrest of bone growth resulting in a short bone or grows at an abnormal angled
- Arthritic joint due to death of bone or repeated injury

- Obstruction of nearby arteries
- Recurrence of symptoms or increasing symptoms if not given adequate time to heal or returning to sports too soon. Appropriately treating the problem the first time will reduce the likelihood of recurrence.
- Healing time will be prolonged if not appropriately treated or not given adequate time to heal
- Untreated inflammation of the growth plate may progress to a complete fracture of the growth plate

### **GENERAL TREATMENT CONSIDERATIONS**

Initial treatment for growth plate injuries is to reduce the fracture (reposition the bones), performed by trained personnel, usually with or without surgery. Realignment is much more difficult after several days. After this is done, treatment consists of the use of medications and ice to relieve pain and immobilization with a splint, cast and/or brace to allow the bones to heal without moving. Surgery is occasionally necessary to reposition the bones and hold the position with rods, pins, plates and/or screws. If the growth plate is inflamed only, rest with or without immobilization (cast, brace or splint) may be all that is necessary.

Immobility of a bone for a long period can cause loss of muscle bulk, stiffness in nearby joints, and edema (accumulation of fluid in tissues). Physical therapy may be necessary to regain motion of nearby after surgery or immobilization and to regain strength of the muscles around the joint. Recovery is complete when there is no bone motion at the fracture site, and radiographs show complete healing.

### **MEDICATION**

- General anesthesia, sedation or muscle relaxants may be necessary to make bone manipulation and repositioning possible (when displaced). After this, medications, such as acetaminophen, may also be used to relieve mild to moderate pain.
- Narcotic pain relievers may be prescribed by your physician for severe pain. Use only as directed.

### **NOTIFY OUR OFFICE IF:**

- The following occur after immobilization or surgery:
  - Swelling above or below the fracture site.
  - Severe, persistent pain
  - Blue or gray skin below the fracture site, especially under the nails or numbness or loss of feeling below the fracture site.
- Report any of the above signs immediately