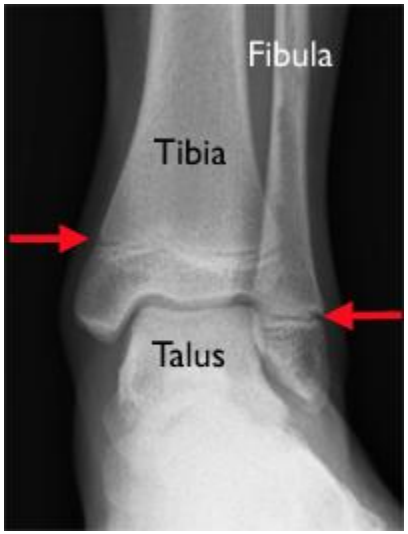
Growth Plate Injuries

"... And when I came down with the rebound, I heard something snap like a twig. How bad is it?"

What Is the Growth Plate?

- The growth plate, is the area of growing tissue near the end of the long bones in children and adolescents. Each long bone has at least two growth plates: one at each end. The growth plate determines the future length and shape of the mature bone. When growth is complete, sometime during adolescence, the growth plates close and are replaced by solid bone.

This x-ray of a child's ankle taken from the front clearly shows the growth plates of the tibia and fibula (red arrows).



Who Gets Growth Plate Injuries?

- These injuries occur in children and adolescents. In a growing child, a serious injury to a joint is more likely to damage a growth plate than the ligaments that stabilize the joint. An injury that would cause a sprain in an adult can be associated with a growth plate injury in a child.
- Injuries to the growth plate are fractures. They comprise 15 % of all childhood fractures. The greatest incidence among 13 to 16 year-old boys and 11 to 13 year-old girls.
- Approximately half of all growth plate injuries occur in the lower end of the outer bone of the forearm at the wrist. These injuries also occur frequently in the lower bones of the leg. They can also occur in the upper leg bone or in the ankle or hip bone.

What Causes Growth Plate Injuries?

- In one large study of growth plate injuries in children, the majority resulted from a fall, usually while running or playing on playground equipment. Competitive sports, such as football, basketball, softball, track and field, and gymnastics, accounted for 35% of all injuries.
- Children who participate in athletic activity often experience some discomfort as they practice new movements. Some aches and pains can be expected, but a child's complaints always deserve careful attention. Some injuries, if left untreated, can cause permanent damage and interfere with proper growth of the involved limb.

A twisting force to the lower leg or foot is a common cause of ankle fractures, as well as ligament injuries (sprains).

How Are Growth Plate Injuries Treated?

Treatment, which should be started as soon as possible after injury, generally involves a mix of the following:

- **Immobilization**

  The affected limb is often put in a cast or splint, and the child is told to limit any activity that puts pressure on the injured area.

- **Manipulation or Surgery**

  If the fracture is displaced, the doctor will have to put the bones or joints back in their correct positions, either by using his or her hands (called manipulation) or by performing surgery (open reduction and internal fixation). After the procedure, the bone will be set in place so it can heal without moving. This is usually done with a cast that encloses the injured growth plate and the joints on both sides of it.

- **Strengthening and Range-of-Motion Exercises**

  These treatments may also be recommended after the fracture is healed.

- **Long-Term Follow-up**

  Long-term follow-up is usually necessary to monitor the child's recuperation and growth. Evaluation includes x rays of matching limbs at 3 to 6-month intervals for at least 2 years.

How to Prevent Growth-Plate Injuries?

Participating in sports is a means of personal expression and education in team building. Young athletes are still growing so growth plates have yet to harden into solid bone. Fractures of the growth plate are common, but preventable. Parents of young athletes can educate children on the causes, effects and prevention of growth-plate injuries.

- **Calcium intake from natural sources is important**

  A child's daily multi-vitamin may supply 100% of the recommended daily intake for calcium, but supplements do not absorb as well as calcium from natural sources. This is because calcium from natural sources is often present in foods alongside vitamin D. Vitamin D is required for the body to absorb calcium.

  Milk may seem like the best choice to increase calcium intake in young athletes, but fortified oatmeal tops the list with 350 mg of calcium per serving. Sardines take the number two spot with 324 mg of calcium, as long as the bones of the sardine are consumed with the meat. Milk rounds out the top three best sources of calcium with 306 mg per cup. Young athletes need between 1,000 and 1,300 mg of calcium per day.

How to Prevent Growth-Plate Injuries?

- **Bulk up like a bodybuilder for stronger bones**

  Weight training is important for bone growth and strength. It is unlikely that your young athlete will walk in the house one day looking like a bodybuilder, but more muscle is important to bone health. Muscle support bone and stronger muscles provide more support. Weight training also increases the density of minerals in bone increasing bone strength.

- **Stretch before every practice, game or competition**

  Stretching decreases the risk of muscle injury during sports activity. While injury to the muscle does not directly hurt bones, falling down due to a muscle injury can cause a bone sprain, strain, break or fracture. Stretches should include all major muscle groups including upper body, lower body and core muscles.

- **Wearing precautionary protective gear**

  Required and recommended protective gear should be worn and respected by children during participation in athletics. Such gear as shin guards, helmets, appropriate padding should be worn during all forms of competition to provide protection from injury.

How to Prevent Growth-Plate Injuries?

All of preventive measures mentioned before will reduce the risk of growth plate injury in young athletes, but children are still more susceptible to injury from play than adults and should be carefully monitored in their activity. By recognizing growth plate injuries in young athletes, parents can ensure a safer sports environment for their children.

References

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