Nationwide Children's
When your child needs a hospital, everything matters.℠

Helping Hand™ Health Education for Patients and Families

Tibial Spine Fracture

Tibial spine fracture (also called Tibial Eminence Fracture) is a break at the top of the tibia bone in the lower leg near the knee. The anterior cruciate ligament (ACL) attaches here. This type of injury is most common in children ages 8 to 14 years of age. It can occur during a sporting event or with a hyperextension injury.

This type of force causes the ACL to pull on the tibial spine. Because the bones of children this age still have open growth plates, the ACL is stronger than the tibial spine and can pull away from the bone (avulse), causing a fracture. This is a serious injury that requires treatment with casting or surgery (Picture 1).

Picture 1 Tibial Spine Fracture

Cause

Tibial spine fractures are often caused by a hyperextension or rotation injury from a quick stop or fall. Children are usually injured this way in a sporting event or fall from a bicycle. It is like an ACL tear in adults.

Diagnosis

Most children go to the Emergency Department (ED) due to severe swelling and pain. Some may go to the orthopedic clinic because of knee pain.

In the ED or clinic, x-rays will be taken to look for injury. If x-rays do not give a clear picture of the break, some patients will have a CT scan. The child will be evaluated by an Orthopedic provider in the ED or clinic. The provider will decide on a plan of care based on these test results.

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Signs and symptoms

- Severe swelling
- Pain
- Cannot bear weight
- Limited range of motion due to unbearable pain

Treatment

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The first step of treatment is an examination in the provider's office or a visit to the ED if your child experienced a knee injury. The child will have x-ray(s) and in some cases a CT scan. Ongoing treatment will be one of the following:

- **Conservative treatment**: If these tests show that the bone is still in its correct place (a nondisplaced tibial spine fracture), the child will be treated conservatively in a knee brace or cast. Unfortunately, in most cases, the bone is too displaced, and your child will need a procedure or surgery to treat this.
- **Closed reduction:** If the fracture is displaced, it will require a procedure called "closed reduction" to realign the bone. This is done in the emergency room or operating room. The child is given medicine to go to sleep so the provider can attempt to realign the bone. If the bone cannot be realigned this way, your child will need a surgical repair.
- **Surgical repair**: Your child is given medicine to go to sleep (anesthesia). The bone is realigned and fixed in place with screws. There will be an incision with a sterile bandage over it. Often after surgery, your child's leg is placed in a brace or cast.

If your child does well, they may go home the next day. Your child's follow-up appointment is usually scheduled 7 to 10 days after the surgery.

What to do and watch for at home

Signs of infection include one or a combination of the following:

- an increase in pain, redness, and/or drainage
- an increase in swelling
- not feeling well
- temperature above 101, especially with one or more of the symptoms above.

Please follow the instructions given to you at the hospital on how to care for the skin.

You will also need to check the circulation in your child's toes. This is to prevent injury to the nerves **and** other tissues that could be caused by swelling.

Circulation Checks

Do circulation checks 3 or 4 times a day while your child is awake for 7 to 10 days. I**f your child has new complaints in the injured area,** start circulation checks again until checks are normal. Do the checks before breakfast, lunch, ... dinner and at bedtime. Compare the injured side to the uninjured side. These are the signs of normal circulation:

- Color: **Pink**
- Swelling: **None**
- Sensation: **Yes**
- Temperature: **Warm**
- Numbness or Tingling: **No**
- Motion: **Yes**
- Capillary Refill: **Rapid (3 seconds or less)**

How to check circulation

Symptom	What to Look For
Color	• Normal: The toenails should be **pink**. • Not normal: A pale or bluish color • How to check: Compare the color of both sides. If the toes are pale or bluish, encourage your child to wiggle them.
Temperature	• Normal: The toes should be **warm** to touch. • Not normal: Cool or cold toes are not normal. • How to check: Compare the temperature of both sides. If toes are cold, put a blanket on to cover the or toes and check again in one hour.
Capillary Refill	• Normal: Pink within 3 seconds or less. Less than 3 seconds is **rapid**. • Not normal: If it takes longer than 3 seconds (the time it takes to say capillary refill), the refill is **slow**. • How to check: With your fingers, squeeze the tip of the toe on the injured side. Or push down on the nail. Where pressure is applied, the area will look white or lighter. Release the pressure and time how long it takes for the color to return.
Swelling	• Normal: There may be some swelling of the injured side, especially in the first 3 to 5 days. Some swelling is all right if it is not associated with severe pain. • Not normal: A large amount of swelling or swelling associated with significant pain.

	• How to check: Compare the injured side to the uninjured foot. In addition to fullness, look for the absence of wrinkles to indicate swelling.
Numbness or Tingling	• Normal: Toes on the uninjured side should feel normal to the child. • Not normal: Numbness or tingling. Numbness or tingling associated with severe pain is very concerning. • How to check: Ask your child if there is any unusual or "funny" feeling in toes. Ask if toes feel "asleep" or like "pins and needles."
Motion	• Normal: Your child should be able to move all the toes on the injured side. • Not normal: Being unable to move the toes on the injured side. • How to check: Ask your child to move the toes. You may also look at your child's toes for movement.
Pain	• Normal: Some pain is normal. Mild to moderate pain may be normal. • Not normal: Pain that is severe or hurts too much for the child to move toes. Severe pain when you move your child's toes. • How to check: Ask your child to wiggle their toes. Straighten and extend all the toes toward the top of your child's foot.

If your child has any results that are not normal, raise the injured leg above the level of the heart. You can prop it up with blankets, firm pillows, cushions or folded blankets. Your child should lie down flat. Then place the injured leg with the cast or splint on the pillows or blankets (toes should be higher than the level of the nose with blankets or cushions behind the calf). **Check the circulation again in one hour.**

If swelling is present, apply an ice pack to the injured leg. Be sure the ice pack will not leak.

Depending upon your child's age, it may be hard to detect some symptoms, such as numbness and sensation. In these cases, rely upon results from the other areas you checked.

Your child will most likely be in a brace or cast and on crutches or using a walker for 4 to 6 weeks. After the brace or cast is discontinued, they will probably start Physical Therapy to help regain knee range of motion and to increase strength. It is important that you and your child follow all instructions and follow the home exercise program given to you by your orthopedic provider or Physical Therapist.

Activity

The practitioner will discuss with you what activity restrictions your child will have. Please have your child limit running, jumping and contact activities for at least 3 months from the time of the injury, or until they are cleared by their practitioner. Your child should participate in only low energy activities. These activities will be reviewed with you and your child by your practitioner.

Your child cannot participate in sports or gym class until cleared by the practitioner.

Follow-up appointments

- Your child's follow-up appointment is on (date) _____ at (time)_____ in the (Place) _____.
- You can expect to bring your child for regular follow-up appointments with their doctor.
- Write down all your questions as you think of them. Bring this list with you when you see the doctor.
- Be sure to call your child's doctor if you cannot keep the appointment.

Questions/other information (write on another sheet if needed).

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