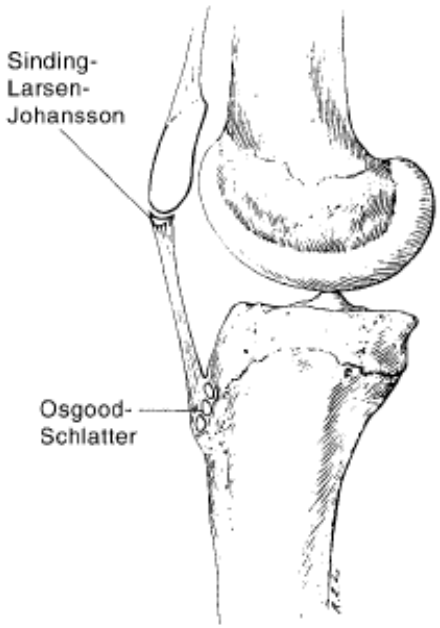
Dr. John A. Schlechter
Pediatric Orthopaedics and Sports Medicine

Osgood-Schlatter Disease



Description

- Osgood-Schlatter disease is an inflammatory injury of the growth plate on the tibia (shin bone) just below the level of the knee at the tibial tubercle
- This disease may also be referred to as osteochondrosis or apophysitis of the tibial tubercle
- The tibial tubercle is the bony attachment for the quadriceps (front thigh muscle). Contraction of the quadriceps results primarily in straightening of the leg at the level of the knee
- A growth plate is an area of developing tissue near the ends of long bones or areas of muscle attachment. The growth plates in children allow the bones to expand in length thus allowing a child to reach his or her full height by the age of 16 to 19
- Compared to the surrounding bone and muscles, the growth plate serves as a weak point. Thus repetitive pulling on a growth plate, especially from a large powerful muscle like the quadriceps, can result in injury to the growth plate and subsequent pain
- Osgood-Schlatter Disease is usually a self limited disease – upon reaching skeletal maturity, the growth plate seals and thus can no longer cause pain
- This condition is very similar in presentation and treatment to Sinding-Larsen-Johansson Syndrome, which is a traction apophysitis of the inferior pole of the patella

Cause

- Repetitive stress or injury to the growth plate of the tibial tubercle results in inflammation and subsequent pain
- The injury has a waxing-and-waning course. Even after pain has subsided for some time, repetitive stress can cause a flare-up

Risk factors

- Activities that involve jumping and/or jogging
- Boys, especially those between the age of 11 and 18
- Rapid skeletal growth
- Poor physical conditioning

Symptoms

- Swelling, warmth, and/or tenderness below the knee
- A firm bump under the knee that is exquisitely tender to touch
- Pain with activity, especially with knee straightening or vigorous activity

Dr. John A. Schlechter
Pediatric Orthopaedics and Sports Medicine

Diagnosis

- Diagnosis of Osgood-Schlatter disease is made primarily by physical exam
- Difficulty may be present with a straight leg raise, especially against resistance
- The area of skin overlying the tibial tubercle may be enlarged and firm. This area is also exquisitely tender to touch
- Radiographs may be used to rule out underlying fractures or other bony injuries in the area

Prevention

- Weight loss to acquire a proper body mass index for age and height
- Warm up and stretching before partaking in physical activity.
- Warming the area with a hot compress or shower may improve stretching
- Maintaining appropriate flexibility, endurance, and muscle strength
- Avoidance of open kinetic leg extensions (such as extending the knee in the sitting position against resistance)

Treatment

- Initial treatment of this injury consists of modification of activities, ice, stretching, strengthening exercises, and pain medications
- Activities such as kneeling, jumping, squatting, stair climbing, and running should be avoided initially
- Ice should be applied for 15-20 minutes to the affected knee every 2 to 3 hours as needed to help reduce inflammation and pain. Similarly, application of a heat pack can be applied to the area before participating in activities or exercises
- Your physician can provide a set of at home exercises to help improve strength and flexibility. In some instances, a referral to physical therapy or an athletic trainer is needed to augment treatment
- Pain medications such as nonsteroidal anti-inflammatories (like ibuprofen or naproxen) or acetaminophen can be used to relieve pain and irritation. These medications should be taken as directed by your physician
- A patellar band, which is a brace situated between the tibial tubercle and the kneecap, may help relieve symptoms

- Observe for extreme pain to palpation at the site, visible swelling, limp, inability to straight leg raise as these findings may be considered prodromal type symptoms that may precede an avulsion fracture and when present should refrain from sport. If they persist despite rest, ice, stretching, activity modification then a return appointment for further management should be arranged.
- Rest = however long it takes for symptoms to resolve to double the amount of time prior to returning to activity and return at a 50% volume and intensity. (EXAMPLE: *If it takes 2 weeks for symptoms to go away then rest would be 4 weeks and if usual participation in activity was 8 hours per week, then would return at 4 hours per week and then slowly add time and intensity over several weeks if no symptoms*)
- In rare instances, surgery is necessary if conservative treatment has failed. A trial of immobilization with an elastic knee support, cast, or splint may be tried for 6 to 8 weeks before considering surgery.
  Complications of this condition include a persistence of a bump overlying the tibial tubercle, reoccurrence in adulthood, tearing away (avulsion) of the growth plate from the tibia.

Surgical Fixation

Dr. John A. Schlechter
Pediatric Orthopaedics and Sports Medicine

RANGE OF MOTION AND STRETCHING EXERCISES • Osgood-Schlatter Disease

These are some of the ***initial*** exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer againor until your symptoms are resolved. Please remember:

- Flexible tissue is more tolerant of the stresses placed on it during activities.
- Each stretch should be held for 20 to 30 seconds.
- A ***gentle*** stretching sensation should be felt.

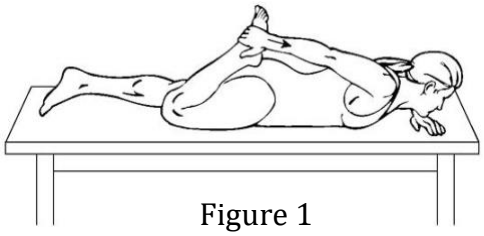


Figure 1

	Prone Quadriceps Stretch (fig. 1)
1.	Lie on your stomach as shown.
2.	Bend your knee, grasping your toes, foot, or ankle. If you are too "tight" to do this, loop a belt or towel around your ankle and grasp that.
3.	Pull your heel toward your buttock until you feel a stretching sensation in the front of your thigh.
4.	Keep your knees together.
5.	Hold this position for **30** seconds.
6.	Repeat exercise **2** times, **2** times per day.

	Hamstring Ballet Stretch (fig. 2)
1.	Stand and prop the leg you are stretching on a chair, table, or other stable object.
2.	Place both hands on the outside of the leg you are stretching.
3.	Make sure that your hips/pelvis are also facing the leg you are stretching.
4.	Slide your hands down the outside of your leg.
5.	Lead with your chest/breast bone. Keep your chest upright and back straight. Do not hunch over at the shoulders. Keep your toes pointing up.
6.	You should feel a stretch in the back of your thigh.
7.	Hold this position for **30** seconds.
8.	Repeat exercise **2** times, **2** times per day.

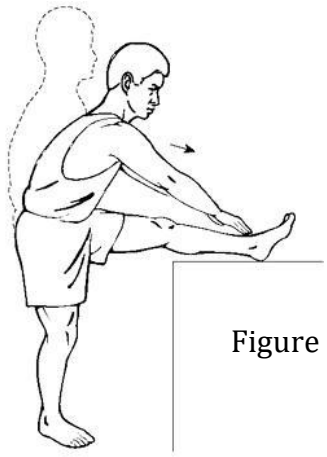


Figure 2

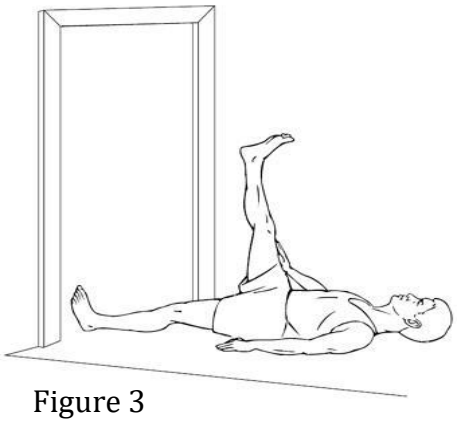


Figure 3

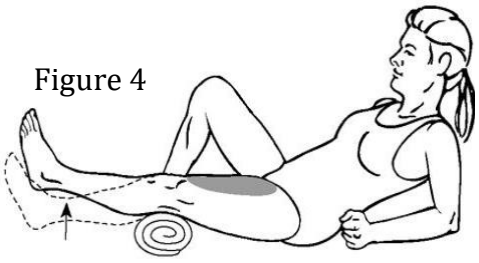
	Hamstring Doorway Stretch (fig. 3)
1.	Lie on your back near the edge of a doorway as shown.
2.	Place the leg you are stretching up the wall keeping your knee straight.
3.	Your buttock should be as close to the wall as possible and the other leg should be kept flat on the floor.
4.	You should feel a stretch in the back of your thigh.
5.	Hold this position for **30** seconds.
6.	Repeat exercise **2** times, **2** times per day.

Dr. John A. Schlechter
Pediatric Orthopaedics and Sports Medicine

Strengthening Exercises for Excessive Lateral Patellar Compression Syndrome. These are some of the ***initial*** exercises you may start your rehabilitation program with until you see your physician, physical therapist, or athletic trainer again or until your symptoms are resolved. Please remember:

- Strong muscles with good endurance tolerate stress better.
- Do the exercises as ***initially*** prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise, gradually increasing the number of repetitions and weight used under their guidance.
- *Only do your exercises in a pain-free range of motion. If the exercises that involve bending your knees while bearing weight cause pain, stop them and consult your physician, physical therapist, or athletic trainer.*

Figure 4



	Quadriceps Leg Lift (fig. 5)
1.	Tighten the muscle in front of your thigh as much as you can, pushing the back of your knee flat against the floor.
2.	Tighten this muscle ***harder.***
3.	Lift your leg/heel 4 to 6 inches off the floor.
4.	Tighten this muscle ***harder again.***
5.	Lower your leg/heel back to the floor. Keep the muscle in front of your thigh as tight as possible.
6.	Tighten this muscle ***harder again.***
7.	Relax.
8.	Repeat exercise **3** times, **2** times per day.

	Quadriceps Short Arcs (fig. 4)
1.	Lie flat or sit with your leg straight.
2.	Place a 3-5 inch roll under your knee, allowing it to bend.
3.	Tighten the muscle in the front of your knee as much as you can, and lift your heel off the floor.
4.	Hold this position for **30** seconds.
5.	Repeat exercise **2** times, **2** times per day.
	If *okayed by your physician, physical therapist, or athletic trainer,* a 2-5 pound weight may be placed around your ankle for additional weight.

Figure 5

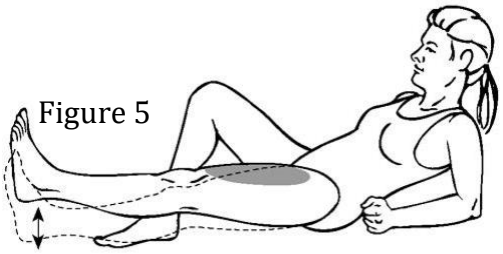
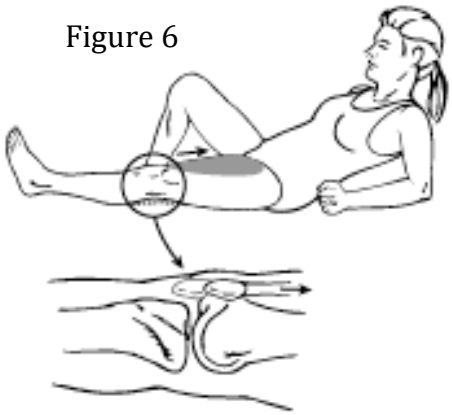


Figure 6



	Quadriceps Isometric Contraction (fig. 6)
1.	Lie flat or sit with your leg straight
2.	Tighten the muscle in the front of your thigh (Quads) as much as you can, pushing the back of the knee flat against the floor. This will pull the kneecap towards the head
3.	Hold the muscle tight for 20-30 seconds
4.	Repeat exercise **10** times, **3** times per day.

Dr. John A. Schlechter
Pediatric Orthopaedics and Sports Medicine

Strengthening Exercises for Excessive Lateral Patellar Compression Syndrome, Continued:

	Quadriceps Wall Slide (fig. 7)
1.	Stand with your back against the wall. Your feet should be shoulder-width apart and approximately 18 to 24 inches away from the wall. Your kneecaps should be in line with the tip of your shoes or your second toe.
2.	Slowly slide down the wall so that there is a 70-90 degree bend in your knees. *(Your physician, physical therapist, or athletic trainer will instruct you how to progress the amount of bend based on your symptoms and diagnosis.)*
3.	Hold this position for **30** seconds. Stand up and rest for **30** seconds
4.	Repeat exercise **3** times, **3** times per day.

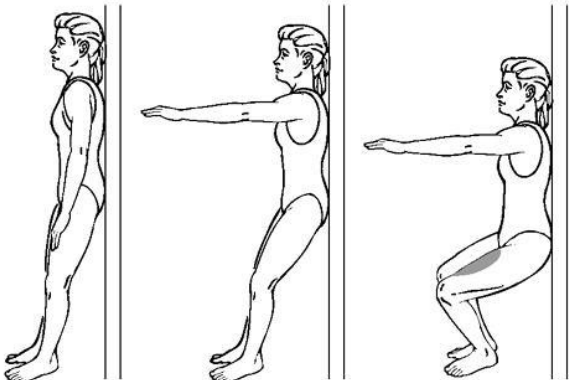


Figure 7

Figure 8

	Quadriceps Kneels (fig. 8)
1.	Stand on the edge of a step/stair. ***Make sure your kneecap is in line with your second toe.***
2.	Slowly step down and touch the heel of your opposite leg on the stair below you. Return to the starting position.
3.	Do not go into a painful range. Stop short of the step if necessary to avoid any pain.
4.	Use your stair rails for balance as needed.
5.	Repeat exercise **3** times, **3** times per day.

	Quadriceps Squats (fig. 9)
1.	Stand with your feet shoulder-width apart and place equal weight on both legs.
2.	Keep your kneecaps in line with your toes.
3.	Slowly bend both knees, keeping ***equal weight*** on both legs, and return to a standing position.
4.	***Do not bend your knees more than 90 degrees.***
5.	You may use the edge of a table or counter for balance if needed.
6.	Repeat exercise **3** times, **3** times per day.

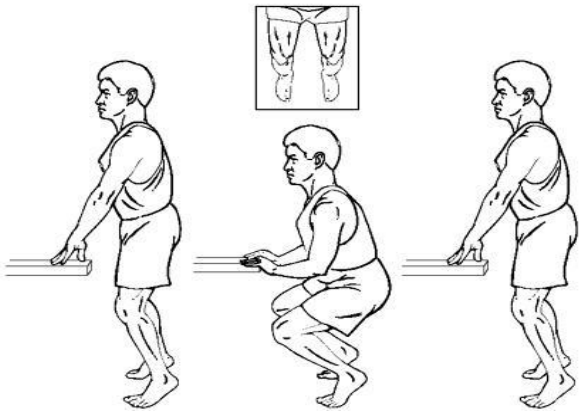


Figure 9