ACL

THE THREE UGLIEST LETTERS IN FEMALE SPORTS

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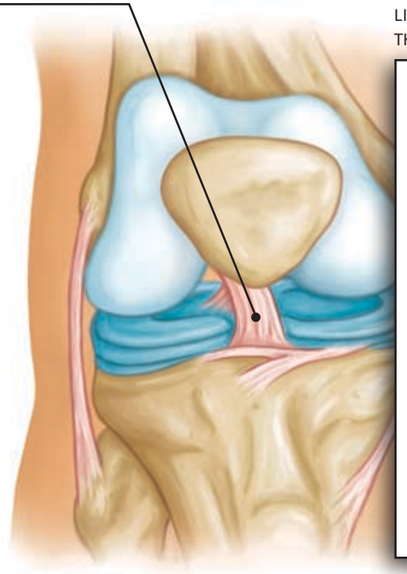
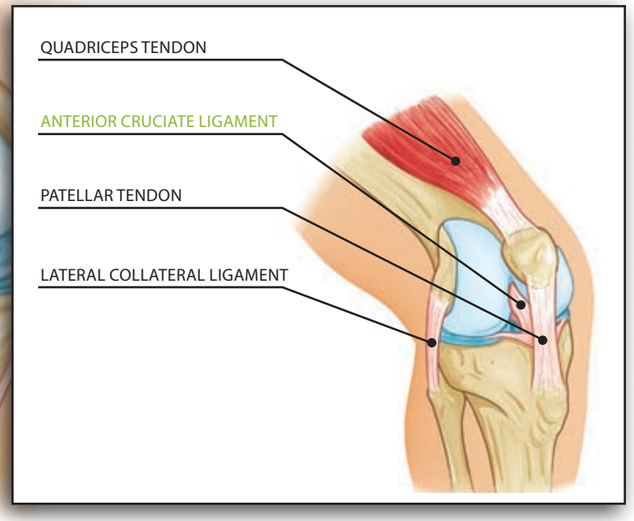


ONE OF FOUR LIGAMENTS THAT STABILIZE THE KNEE, THE ACL IS A RUBBER BAND-LIKE FIBER THAT RUNS THROUGH THE CENTER OF THE KNEE JOINT, ATTACHING THE THIGH BONE (FEMUR) TO THE SHIN BONE (TIBIA).



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It was a play Lake Forest (Lake Forest, Ill.) soccer star Rachel Quon had made thousands of times before. As a sweeper, she was always chasing the ball back toward her goal line. This time she planted her left foot, pivoted and kicked with her right leg to clear the ball back upfield.

She ran two more steps before she heard — and felt — a pop in her right knee. In the milliseconds before she fell to the ground, a few fleeting thoughts went through Quon's mind: *Maybe it was my MCL. Please let it be my MCL. Don't let it be my ACL.*

Her wishful thinking was crushed when searing pain and a follow-up crack sealed the deal — her ACL was torn. Quon hit the turf hard, breaking her right collarbone, to boot.

"I was worried that was the end of my career," Quon says. "I knew I wanted to play again, but I wasn't sure if I'd be able to come back. You hear about players who come back strong, but you also hear about players who don't."

Waubonsie Valley (Aurora, Ill.) midfielder Bri Rodriguez watched Quon tumble to the ground from across the field. It was early July 2007, and the two Illinois natives were training with the U.S. Soccer U-16 Girls' National Team at Seton Hall University in New Jersey. Though they played at different Chicago-area high schools, they were friends who played together with the Eclipse Select Club.

Less than a year later, Rodriguez heard a sound like knuckles cracking as she planted with her left foot, pivoted and cleared the ball with her right foot early in the first half of Waubonsie's state quarterfinal win over Maine South (Park Ridge, Ill.) last May.

"I knew I hurt something," says Rodriguez, the 2007-08 Gatorade Illinois Girls' Soccer Player of the Year. "But I didn't think it hurt that much, so I didn't think it was my ACL."

After crumpling to the ground, Rodriguez got back up with the help of a trainer. She jogged and juggled a soccer ball on the sideline and soon declared herself fit to return to the game. As she planted her left leg for a corner kick just moments after returning to the field, her knee gave out again. Rodriguez stayed down this time, her left ACL torn.

The anterior cruciate ligament, one of four ligaments that stabilize the knee, is a rubber band-like fiber no bigger than your pinky. It runs through the center of the knee joint, attaching the thigh bone (femur) to the shin bone (tibia). When torn (usually the result of jumping, landing or sudden changes in direction), the ACL causes the shinbone to slide forward onto the thighbone and the knee to give out. Rapid swelling typically results in pain so severe it sidelines athletes.

Quon and Rodriguez put two faces on a frightening statistic. Recent studies show that young female athletes are up to eight times more likely to tear their ACLs than young male athletes. According to the Centers for Disease Control and Prevention, nearly 30,000 girls age 19 and younger suffered ACL injuries that required surgical repair in 2006.

"This injury is of epidemic nature."

"This injury is of epidemic nature in terms of incidence and occurrence in females versus males," says National Athletic Trainers' Association president Marjorie Albohm, a certified athletic trainer.

It takes major reconstructive surgery and up to a year of rehab to bounce back from an ACL tear, but Albohm says most victims eventually return to their sports at full strength. There's no better example than Candace Parker, who since suffering a torn ACL in high school has won the Naismith Award as the nation's top college player as well as WNBA MVP and Rookie of the Year.

While research cannot pinpoint a definitive cause for the higher numbers of ACL tears in female athletes, there are many contributing factors. When athletes of either sex hit puberty — typically around the time they're freshmen in high school — they're asked to train harder than ever before. But girls often have bodies unequipped for such vigorous training.

As a boy's testosterone level increases, he naturally adds muscle and gets stronger. But as a girl's estrogen level increases, she adds more fat than muscle while her ligaments become more lax and susceptible to injury. Subsequently, girls don't naturally develop muscle necessary to keep their joints in safe and stable positions.

RACHEL QUON TORE HER RIGHT ACL WHILE TRAINING WITH THE U.S. SOCCER U-16 GIRLS' NATIONAL TEAM IN JULY 2007. TODAY SHE SAYS HER KNEE IS STRONGER THAN IT WAS BEFORE THE INJURY.

Another factor is anatomical. The pelvis bone on females is wider than on males, increasing the angle at which the femur attaches to the tibia. The steeper the angle, the more the knees rotate in and the bottom of the legs splay out, causing a knock-kneed stance that puts excess stress on the ACL. Also, as girls develop, their neuromuscular response becomes less precise than that of boys. When girls decelerate, suddenly change direction, jump or land, their ligaments and bones absorb most of the impact. In boys, muscle absorbs the majority of the impact.

"ACL tears happen to girls that are in good physical shape and they happen because their movement patterns are not ideal," says Dr. Letha Griffin of the Peachtree Orthopaedic Clinic in Atlanta. "Instead of playing with their hips and knees bent, girls play more upright. And in that position, with any quick, pivotal move there is a chance an ACL may be torn."

However, most doctors and athletic trainers believe that with education, many ACL tears in girls can be prevented. If girls start training programs early enough and do them with regularity, they can develop their hamstrings, quadriceps and gluteal muscles and learn to accelerate, decelerate, jump, land and cut in a much safer manner. To put it bluntly, they can learn to move more like boys, with their hips and knees bent and their body balanced over their lower extremities.

"We can't change anatomy, but we can change the way girls move neuromuscularly," says Griffin, a spokesperson for the American Academy of Orthopaedic Surgeons. "But we have to get on them all the time."

To that end, Griffin's AAOS and Albohm's NATA joined forces in March to release a public service campaign aimed at educating athletes, coaches and parents on the ease and importance of ACL injury prevention.

Most programs designed for preventing ACL injuries take just 20 minutes per session to complete, yet neither Quon nor Rodriguez regularly participated in any such program with their various teams.

"Sometimes at the Olympic Development Programs, they will have us focus on dynamic warm-ups, but it's not something we do all the time," Quon says.

"I've only done it four or five times in my soccer career," Rodriguez adds.

The end result was that both girls, two of the best high school soccer players in the country, underwent complete ACL reconstructions.

During surgery, the damaged ligament is replaced with a tendon graft, most commonly from a piece of the athlete's own hamstring or patellar tendon. Every now and then, a cadaver graft is used.

Once implanted, the graft first dies because it's not connected to any blood supply. Thereafter, it serves as scaffolding upon which the body will gradually grow a surrogate ACL. This "ligamentization" process cannot be rushed, turning ACL rehab into a painful ordeal that can last between six months and a year.

Quon had to postpone her ACL surgery for a month while her collarbone healed enough to handle several weeks on crutches. Once she underwent the ACL reconstruction, Quon began an extensive rehab process that included physical therapy three times a week.

It took her four months to start running again and about seven months to start playing. Through it all, Quon also had to deal with emotional challenges.

"I was angry and sad," she says. "I was at my highest peak at National Team camp and I knew I'd have to start all over again. Rehab was very painful and one day I broke down and started crying. But once I got it out I realized I had to focus on getting better."

Not long after Quon returned to the field, Rodriguez went in for surgery last June. She had the knowledge of Quon's experience to prepare her for what to expect, yet rehab was still difficult.

Starting the day after her surgery, Rodriguez had physical therapy appointments three times a week up until this past December. On days she didn't go to PT, Rodriguez still had exercises to perform on her own. In all, recovery proved to be a seven-day-a-week job.

"I cried every day for the first three weeks when my therapist would bend my knee," Rodriguez says. "Later on, the most frustrating thing was how much weaker my left leg was than my right leg."

Quon was cleared to play in March of 2008. It took her a few months to get her game back, but by November she was back to her old self while playing with the United States silver-medal team at the U-17 Women's World Cup in New Zealand.

Now Quon believes she's stronger and better than she was before surgery.

"An ACL injury is not the end of the world."

Rodriguez, who was cleared to play in January, has the same hopes. She has recovered fully but says her knee still feels weaker than before. And from a soccer perspective, her skill level lags behind what it once was.

"I just need to play more," she says.

Both girls are playing their senior soccer seasons at their respective high schools this spring and preparing for college in the fall. Quon will play for Stanford, while Rodriguez will play for West Virginia.

"Girls need to know an ACL injury is not the end of the world," Quon says. "I'm 100 percent now. You can always come back. Just don't ever give up."

AFTER TEARING HER LEFT ACL LAST MAY, BRI RODRIGUEZ WAS CLEARED TO PLAY THIS PAST JANUARY. YET SHE SAYS HER LEFT KNEE IS STILL WEAKER THAN IT WAS BEFORE.

TAKE PRECAUTION

KEEP YOUR ACL HEALTHY WITH THESE FOUR EXERCISES

WALKING LUNGES

WHY: Strengthen the quads.

HOW TO: Lunge forward with your right leg. Push off with the right leg, then lunge forward with your left leg. Drop your back knee straight down, keeping your front knee over your ankle. Repeat.

HOW MANY: Three sets of 10 on each side.

TIPS: Do not allow your front knee to cave inward. If you can't see your toes on your front foot, you're doing the exercise incorrectly.

SINGLE TOE RAISES

WHY: Strengthen the calves and increase balance.

HOW TO: With your arms at your sides, balance on your right leg with your left knee bent up toward your chest. While maintaining your balance, slowly rise up on your right toes, then slowly lower down. Repeat on the opposite side.

HOW MANY: Thirty reps on each side.

TIPS: As your calves get stronger, you may need to increase the number of repetitions and sets.

FORWARD/BACKWARD JUMPS

WHY: Increase power and strength while maintaining neuromuscular control.

HOW TO: Stand with a 6-inch cone, soccer ball or basketball in front of you. Bend your knees and jump over the cone/ball, landing softly on the balls of your feet with your knees bent. Jump backward over the ball using the same technique.

HOW MANY: Repeat 20 times.

TIPS: Make sure not to straighten your knees. This drill can also be repeated using one leg at a time.

LATERAL JUMPS

WHY: Increase power and strength while maintaining neuromuscular control.

HOW TO: Stand with a 6-inch cone, soccer ball or basketball to your right. Bend your knees and jump over the cone/ball, landing softly on the balls of your feet with your knees bent. Jump back over the ball to the left, using the same technique.

HOW MANY: Repeat 20 times.

TIPS: Make sure not to straighten your knees. This drill can also be repeated using one leg at a time.

** For a full training regimen, check out Santa Monica Orthopaedic's PEP Program at www.aclprevent.com*