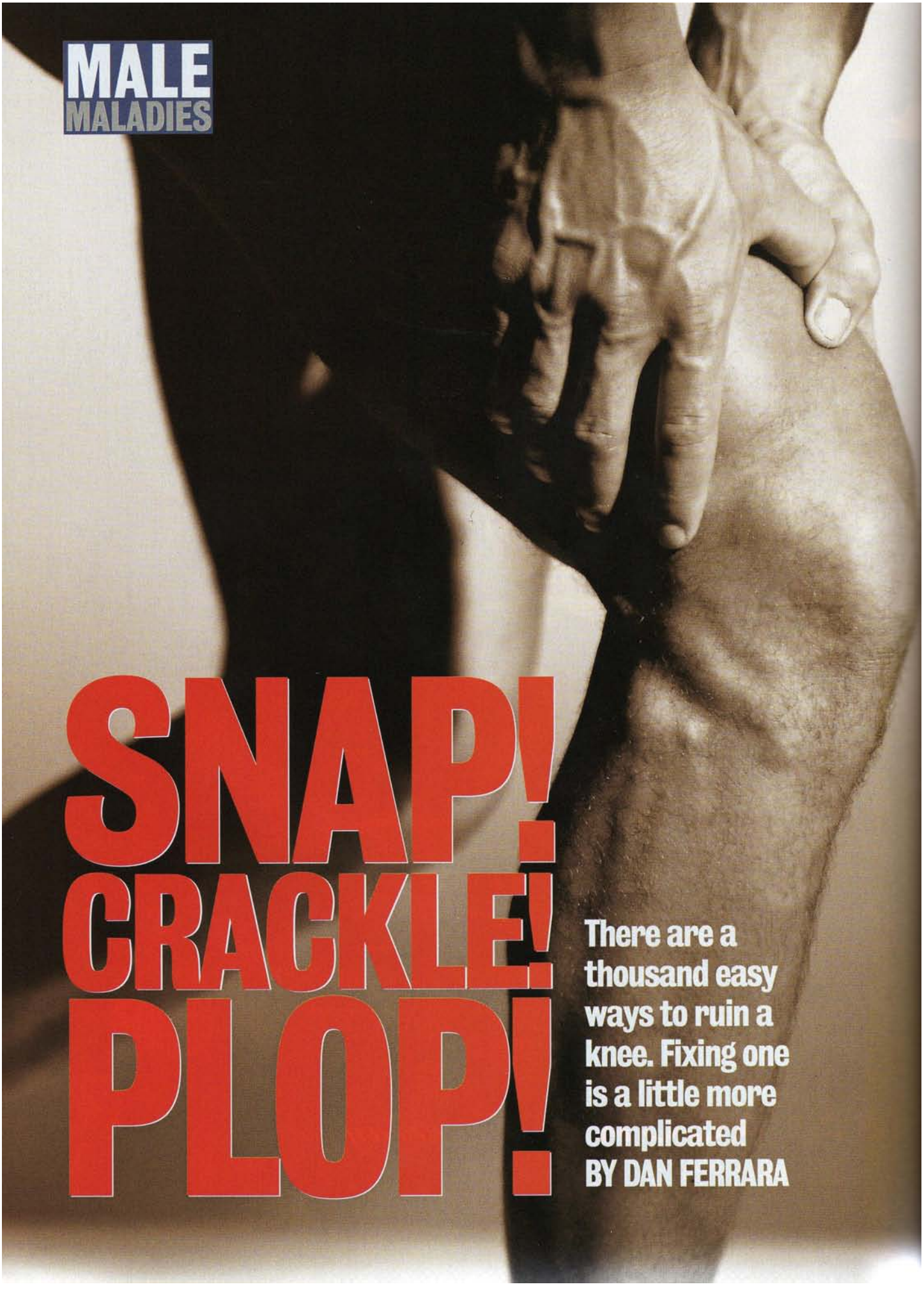


MALE MALADIES

# SNAP! CRACKLE! PLOP!

**There are a thousand easy ways to ruin a knee. Fixing one is a little more complicated**

**BY DAN FERRARA**

There's an old medical joke about an operation's being a success even though the patient died on the table. In the case of my own knee surgery, the procedure went beautifully, but my lifelong hobby of competitive running may be over. It's been eighteen months, and I have not experienced a pain-free step of running. What went wrong?

Nothing in particular. My case just happens to be proof of a crummy little medical axiom: Sometimes you do everything you can and things don't workout. The knee teaches that lesson all the time.

My problem started with a common enough injury, a tear of a piece of cartilage called the medial meniscus. (If there are an estimated 3 million knee injuries a year, then clearly there are hundreds of thousands of meniscus tears.) And it could well stay with me the rest of my days as arthritis. That's what is stopping me from running now. Arthritis is, in fact, the almost inevitable result of most knee injuries, which is not something most of us think of when we consider either the stunning number of people who go down with knee problems every year- doesn't it seem as if they're dropping all around you?- or the surgical advances that make it so preposterously simple to drop in, get repaired and stroll out. But it's true. Arthritis found me in my thirties, but it's going to walk down plenty of my peers before the day is out. And everyone will be thinking the same thing: Who knew that the injury was the least of it?

The surgeon who trimmed my meniscus is Jonathan L. Glashow, who runs a sports-medicine-focused orthopedic practice in New York City. Glashow points to three reasons his practice is thriving. First, he says, "just look at people's heights and weights." Men, in particular, are bigger than they used to be and as a result can now hit one another harder: Any afternoon of NFL football will confirm that for you. Second, people are engaged in more aggressive sports, such as snowboarding and kickboxing. Third, sporting equipment that guards against ankle traumas and leg fractures - an earlier generation's scourges - often moves the stress right up the leg to the knee. This is especially true of the newest ski boots. To all this, add the fact of an aging, active population.

The knee is complex enough to be damaged in a host of different ways, but most sports knee injuries requiring surgical repair are one of three types. Most common is a slow grinding away of the underside of the patella, or kneecap. Most spectacular, because it often happens with a loud *pop*, is a violent tear of the anterior cruciate ligament, or ACL. Then there's the meniscus tear, which can begin small and spread gradually or can happen traumatically. (A fourth common type of injury, a partial tear of the medial collateral ligament, tends to be less serious and can almost always be treated nonsurgically.)

Patellar problems are essentially about alignment. The issue here is location. The patella is an odd little thing called a sesamoid bone and needs to sit precisely in a vertical groove in the southernmost part of the femur, or thighbone. If it's well situated, it tracks up and down as activity demands. But the patella stays in place only by virtue of a complicated tethering act. The patellar tendon, which attaches to the tibia, or shinbone, binds from the bottom. The quadriceps, a muscle divided into four parts, as the name suggests, binds from the top. Broad fibrous bands called retinacula bind from the sides. Often the outer quadriceps muscle becomes stronger than its inner counterparts and the patella loses its groove. It doesn't take much of a shift for the kneecap to start banging into or rubbing against the bone it's supposed to slide past. Both the underside of the patella and the end of the femur are coated with articular cartilage, a smooth, shiny substance that protects the ends of bones - you can see the bird version on the end of a chicken drumstick - but this stuff can take only so much friction. As the cartilage starts to wear away, untreated, the pain can become dramatic.

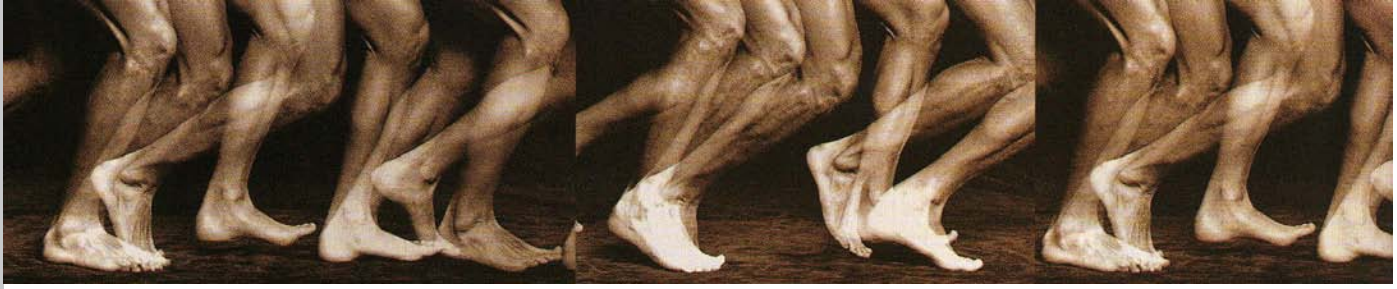
Drama is pretty much guaranteed the moment the ACL goes. In nearly every case, an ACL tear results from a combination of twisting and sudden lateral movement- impact with another person, as on a football field or a basketball court, or, less gloriously, a loss of balance, as in a missed step off a ladder.

The ACL is necessary for stability. It is an unassuming band- barely thicker than a pencil - that runs in an essentially vertical plane to connect the femur and the tibia. (If you were to pluck off your kneecap, you would be looking right at your ACL.) When you plant a foot and push off, it is one of the structures that make sure your lower leg doesn't go one way and your upper leg another.

Though sometimes they do just that. In such a case, the ACL doesn't only get yanked. Occasionally, it catches on the condyle, the round end of the femur (again, refer to your drumstick model), where it stretches and stretches until it blows, often audibly and always painfully. Sometimes rotary stresses snap it. The long-term result is a joint that feels unsteady and that tends to buckle, usually forward, at the wrong time.

Weak spot number three, the meniscus, is a cushion. It lies on a horizontal plane smack between the femur and the tibia, where its job is to prevent these bones, two of the largest in the body, from banging into each other. (There are two menisci in each knee, the medial and the lateral.) The meniscus is cartilage, though not the articular cartilage found on the ends of bones: This is fiber cartilage, a softer, more flexible substance. A meniscus tear can happen in a trauma- often, the incident that blows out an ACL will also rip the meniscus - but most commonly it's the result of repetitive motion. Too much squatting, for example. Plumbers develop meniscus troubles and so do baseball catchers. The near inevitability of the problem is a reason good-hitting catchers are moved to first base as they age.

Many knee injuries can be addressed with surgical procedures that may seem stunning to anyone who hasn't been keeping up. Almost all work inside the knee is done arthroscopically - that is, through a camera-equipped cutting instrument that is inserted directly into the knee. To repair a damaged patella, it is now possible to go into the knee arthroscopically and grab a dab of cartilage, which is then sent to a laboratory and used as the basis for a new crop of genetically identical cartilage, which is used to re-line the back of the kneecap in open surgery. Torn ACLs are simply replaced with new product from one of three sources:



the patient's own patellar tendon, which is thick enough to yield a useful strip, the patient's own hamstring tendon (ditto) or someone else's patellar tendon. Someone who can't complain.

**New York orthopedic surgeon Jacob Rozbruch** is going to give a friend of mine a tendon from a cadaver. The beauty of this third-party approach, called allografting, is the reduction of trauma from surgery- the greater part of the misery that follows an ACL repair, Rozbruch says, is from the autograft, the removal of a portion of healthy tendon from the patient's leg. You can be the judge of the creepiness of allografting, but Rozbruch says it cuts recovery time by as much as two-thirds. He expects a patient to feel good in two or three months (better, in fact, than is entirely safe; as autograftee Jerry Rice learned last fall, a repaired ACL and its surrounding components aren't as strong as they feel) and to be able to play sports with a brace at six months. The brace comes off after the one-year mark. The tendon continues to strengthen for yet another year.

One more miracle-of-science story. In many cases, the trauma that causes an ACL or meniscus tear also damages the articular cartilage on the condyle. That's a problem that should be addressed, because the articular damage is going to spread, even if the ligament or cartilage injury is fixed. A surgeon can simply drill out the damaged spot, going through the sixth of an inch or so of cartilage and into the bone. Then the surgeon moves over to another, low-traffic spot on the condyle and extracts an appropriately sized plug of cartilage and bone. Put that healthy plug into the hole, allow for some healing, and you're set.

So why the general gloom about knees? It comes back to arthritis. Once the knee goes bad, it's almost certainly going to get worse.

A tear of the ACL or meniscus does not in itself set the table for arthritis. But it is likely the trauma that produced the injury also damaged the articular cartilage. Even if that didn't happen, all the relationships in the knee are going to be changed immediately. Things are going to start bumping and grinding, and the articular cartilage is going to develop imperfections. Glashow likens this process to a smooth street that finally develops a pothole, which then gets larger at an accelerating speed. When the damage in a knee and the attendant inflammation reach a certain point, what you have is the chronic inflammation known as degenerative arthritis. The final, gruesome step is the cartilage's wearing through so that bone rubs on bone. That hurts.

If you're looking for reasons to be hopeful, here are the best available. First, proper function limits inflammation and hence slows degeneration as much as possible. So if you damage your knee, have it fixed, either surgically or through physical therapy, which will help you strengthen the appropriate supporting muscles. My big mistake, apparently, was not getting my meniscus looked after earlier.

The second reason to be hopeful is that some people have strong, resilient cartilage. A little ding doesn't cause it to rush toward inflammation and degeneration. (Arthritis maybe inexorable, but it isn't always in a hurry.) Why are some people so blessed? No particular reason. Are you one? Whack your knee and you may find out.

I was probably dealt a decent cartilage hand, my frustrations notwithstanding. This bad knee has about 30,000 miles of running on it. I'm grateful for that, and I've moved on to activities that don't hurt and don't seem to be accelerating the damage. Glashow approves; he says too few knee patients accept the idea that surgery will leave them anything but as good as new. It's as if they think they've had a tire changed, he says- they expect to get right back on the freeway.

God bless these people. But we'll save a little room over here in the slow lane.

*Dan Ferrara's parts are all his own.*

→ visit www.JacobRozbruchMD.com ←

## AN OUNCE OF PREVENTION IS WORTH A POUND OF CARTILAGE

**The running and jumping associated with physical exercise place six to nine times a person's body weight on the knees. While most people train to exert more force. Robert Gotlin, director of orthopedics and sports in the department of physical medicine at New York City's Beth Israel Medical Center notes that few train to absorb the added pressure.**

**Strengthening the hamstrings and quadriceps is the key. Leg extensions and calf raises will help make those muscles tough enough for you to be, well, if not like Mike, at least better than Gheorghe Muresan. Absorbing your ever increasing vertical, or at least that of a seven-foot-seven Romanian, is as simple as walking. If you can resist the urge to break into "Billie Jean," Gotlin suggests walking backward, which helps strengthen the hamstrings. Walking downstairs, he adds, "is a great exercise to strengthen the quads."**

**Good form helps, too. "You must first learn how to land before you can jump," Gotlin says. When you leap over your office manager for a rebound, as your feet hit the ground your knees should be bent so that your kneecaps line up with the fronts of your shoes. "You want to try not to hyperextend [too straight] or hyperflex [too bent] your knee," says Gotlin. To improve your form, he suggests stretching with your back to a table, bending your leg so the top of the foot rests on the table and then leaning forward.**

**Sadly, no number of leg lifts or sneakers (a pair with good arch support is best) will immunize you against every injury. Orthopedic surgeon Norman Scott, whose pioneering knee-ligament surgery, first performed on former NBA all-star Bernard King, helped prolong the careers of many professional athletes with similar injuries, says that should you hear an unnatural pop in your knee or experience pain, apply ice immediately (a practice the New York Knicks' team physician recommends after each workout). If swelling persists, as the saying goes, see a doctor.**

**And go soon. After all, you've got a Romanian giant to outjump.** —PAUL FORRESTER