A Useful Technique for Treating Mallet Finger Fractures

You wouldn't think a fracture of the tip of a finger would be a big deal. But without proper treatment, the affected tip can end up in a bent position called mallet finger. That fixed position can be annoying, painful, and limit function. Mallet finger injuries are common among sports athletes but they can also occur at work and during activities at home.

An injury of this kind affects the distal interphalangeal (DIP) joint. That's the anatomical term for the joint that moves the tip of the finger. Baseball players top the list of people at risk for mallet finger injuries. Usually the tip of the finger is hit by a fast moving ball.

Fracture of the bone can be accompanied by avulsion -- a piece of bone gets pulled off and away from the bone along with the tendon that attaches to the bone. To be more specific, a mallet finger fracture is an avulsion of the extensor tendon with a piece of bone still attached to it. The damage occurs where the tendon normally attaches to the base of the phalanx (finger bone).

What's the best way to treat this problem? That's the subject of this study from the People's Republic of China. Hand surgeons used a special technique called pull-out wire fixation to treat mallet finger fractures in 65 patients. They also used K-wires to help stabilize the fracture site until healing could take place.

The reason this surgical technique is different is the combination of the pull-out wire and K-wire. Other surgeons using just one of those techniques often report failed surgeries.

With the repair made using just one fixation technique, patients can end up with skin or bone necrosis (death), migration (movement) of pins used to hold the bone pieces together, and loss of reduction. Loss of reduction refers to the fact that the bone fragment that was reattached to the main phalanx moves away again.

In this study, before surgery was done, each one of the 65 patients was treated conservatively without surgery. They were placed in a splint until bone healing took place. That is the standard of first-line care for mallet finger fractures. But if nonsurgical treatment fails, then surgery is needed to repair the problem.

Not all mallet finger fractures need this extra surgical fixation. The authors included only patients who had an avulsed fracture that had shifted or moved more than one-third the distance of the joint surface. There was only one bone fragment and it was displaced at the time of the injury.

The authors provide a detailed description of the procedure for hand surgeons interested in trying this technique. Photos, X-rays, and schematic drawings are included to show how to place the wire through a tunnel in the bone, then through the ruptured tendon in such a way as to loop around the bone fragment and pull it tight against the phalanx.

Traction force and angles needed for a successful surgery are also discussed. Drawings of incorrect wire placement and too small or too large of an angle of pull are also depicted. A 45-degree angle is ideal. Anything more or less than this can create additional problems.

The good results bear out the value of this pull-out wire fixation technique. Measures used to assess success included complications such as nail deformities, skin breakdown and necrosis, and wound or wire track infections. They had no incidences of any of these potential complications. No one developed additional fractures from the pull exerted on the bone from the treatment. All patients healed with full union between
the two pieces of bone.

Loss of joint motion and extensor lag were the biggest problems experienced. Most of those losses were mild. Extensor lag refers to the fact that the extensor tendon does not pull the tip of the finger as straight as possible. The tip is left slightly flexed or bent.

The authors concluded that their proposed combined technique of pull-out wire fixation and K-wire stabilization are just the trick to get an unstable, displaced mallet finger fracture to heal. This surgical technique also preserves the damaged joint and may possibly help prevent osteoarthritis later down the road. The only disadvantage is the possibility of an extensor lag affecting finger motion and function.

It is not advised to use these two techniques together for anyone who has a nondisplaced fracture. Patients with a stable fracture of that type benefit from conservative (nonoperative) care with immobilization in a cast. The surgical procedure described is fairly complex and requires a skilled surgeon to perform it.