

Review of a Wrist Fracture Called the Galeazzi Fracture

There are several different types of fractures that affect the wrist. This article is focused on fractures of the joint between the two bones of the forearm (the radius and the ulna). Those two bones meet at the elbow and at the wrist. That particular joint at the wrist is called the distal radioulnar joint or DRUJ. A fracture that disrupts the DRUJ is called a Galeazzi fracture.

In this article, orthopedic hand surgeons present a review of Galeazzi fractures from top to bottom. They begin with a description of the fracture, then review the anatomy, and describe the mechanism of injury that causes these fractures. From there, they cover diagnosis and treatment with a follow-up on complications and prognosis. If you have this type of fracture (or know someone else who does), then this article will help you understand all the complexities of this injury.

Let's start with a quick description of the fracture. The main area affected is the shaft of the radius (forearm bone) down at the end closest to the wrist. Some experts who have studied this problem say Galeazzi fractures occur when the distal one-third of the radial shaft is broken.

But it's more than just the bone because the fracture causes a disruption of the joint where the radius and ulna are connected together. The interosseous membrane -- ligaments that hold the two bones together along the length of the bones can be torn when the force of the injury is forceful enough.

Most of the damage is done when the person falls with an outstretched arm and lands on the wrist with the hand bent back into full extension. The force of the impact causes the break. Other events such as car accidents, electric shock, and blunt trauma can also result in a Galeazzi wrist fracture.

Dislocation of the radius and ulna is a key feature of the Galeazzi fracture. Along with dislocation of the two bones comes a rupture of the fibrous cartilage where the two bones meet the carpal (wrist) bones. The soft tissue at that junction is called the triangular fibrocartilage or TFCC.

If that's not bad enough, without this important soft tissue structure, the fractured radial bone jams up on itself causing a shortening of the bone. Muscles in the forearm add their own forces on the broken bone causing further deformities.

Combined together, the result of a Galeazzi fracture can be very disabling causing significant functional limitations. Turning door knobs, picking up groceries, even toileting can be difficult if not impossible. Children and adults can both have this type of fracture. Treatment is similar but has some differences depending on age and severity of the damage done. For children, involvement of the growth plate creates some additional potential problems.

What can be done to manage this problem? First, an accurate diagnosis and discovery of the full impact of the damage is important. Some of the worst results occur because of a failure to identify (and treat) all of the soft tissue injuries.

After hearing the history of what happened and examining the injury, the surgeon will order X-rays. Studies show that 20 per cent of true distal radioulnar joint (DRUJ) injuries won't show up on an X-ray. CT scans aren't routinely ordered but may be necessary.

Treatment for children is usually with closed reduction and immobilization in a cast that goes up above the elbow. Closed reduction refers to setting the break without cutting the wrist open surgically. Anesthesia is

still required to put the child to sleep while performing this procedure. Special real-time X-rays (called fluoroscopy) are used to confirm correct placement of the bones.

If all goes well and the fracture heals, then no further treatment is needed. But in some children, the fracture doesn't heal or the bones shift apart and there is a loss of the reduction. That requires surgery to pin the bones together, recast, and try again.

For the adult with a Galeazzi fracture, a procedure called open reduction and internal fixation or ORIF is almost always required. These fractures are very unstable in adults and don't respond well at all to conservative (nonoperative) care. In adults, the weight of the hand and the strength of the muscles pulling on the broken bones are just too much to allow for a good result using the same treatment approach as with children.

During surgery, the surgeon will check each patient carefully for any other soft tissue injuries and repair these as well. Metal plates may be used to hold the broken bone together. The surgeon carefully bends the plate to match the curve of the bone. Aligning the plate as closely as possible to the bone surface will help avoid further deforming forces from affecting the fracture. The use of locking plates is not advised. Nonlocking plating systems seem to provide better stability due to the rotational forces in the wrist and forearm when turning the hand palm up or down.

Other soft tissue injuries may require the use of pins and/or special wires called K-wires to reposition and hold everything together until healing occurs. In some cases, the situation is much worse because cartilage, bone, or ligament fragments can get caught between the pieces of broken bone or jammed inside the joint. That's when the surgeon has to perform some very complex surgical repairs.

As you can probably tell, final results or outcomes (prognosis) depend on severity of the injury and any complications that may arise during or after surgery. Nerve damage, failure of the bone to heal, deformities, and chronic pain are just some of the problems that can develop.

Sometimes more than one surgery is required to stabilize the joint. The goal is always to reduce pain, improve motion, and restore function. Cosmetics may have to take a back seat if the surgeon has to choose between form and function. As the authors of this review article conclude, this is a complex surgical problem that requires full understanding of all its features. Accurate, early diagnosis with appropriate treatment helps provide the best possible long-term results.

Reference: Kivanc I. Atesok, MD, et al. Galeazzi Fracture. In *Journal of the American Academy of Orthopaedic Surgeons*. October 2011. Vol. 19. No. 10. Pp. 623-633.