



THE UNIVERSITY OF TOLEDO MEDICAL CENTER

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BY: NABIL EBRAHEIM, M.D.

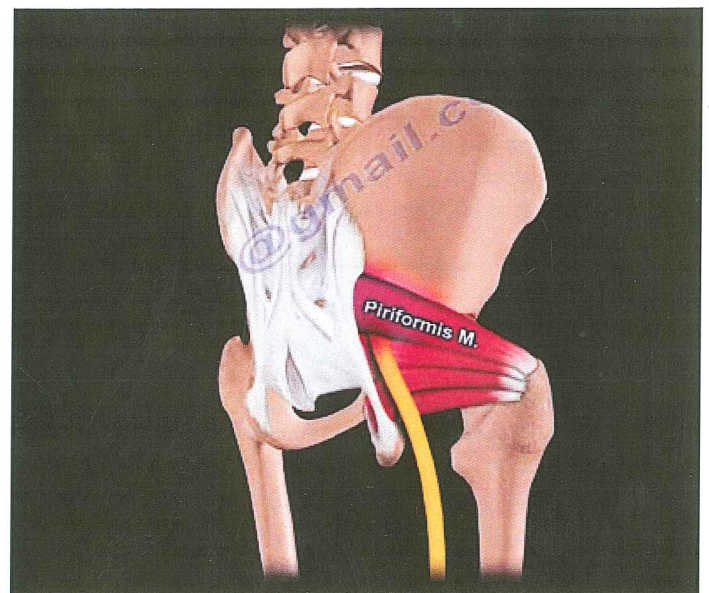
Piriformis Syndrome Tests

Piriformis syndrome is becoming a popular condition and this syndrome is not clearly understood, as there is minimal information related to the subject of piriformis syndrome. Piriformis syndrome is a condition of leg pain or sciatica due to compression of the sciatic nerve at the hip. The sciatic nerve is irritated—not due to spine problems—but from problems related to and associated with the piriformis muscle. Clearly, piriformis syndrome can be confused with sciatica and lower back pain. Sometimes, it is hard to differentiate between piriformis syndrome and lumbar spinal disc herniation which both can cause sciatica.

The straight leg raising test is the gold standard as a clinical test to diagnose disc herniation that is irritating the sciatic nerve. Elevation of a painful limb can cause sciatica and radicular pain. If the test is positive, consider spine problems. A herniated disc is typically the source of sciatic pain. The patient that undergoes surgery to remove a herniated disc will get better from the surgery if there is a positive straight leg raising test before the surgery. Sometimes this test is called the stretch test. The piriformis muscle arises from the anterolateral part of the sacrum and is inserted into the posterior aspect of the greater trochanter (deep into the buttock).

Pain associated with piriformis syndrome is usually deep in the buttock and posterior thigh. It may also include the posterior aspect of the leg due to irritation of the sciatic nerve. The patient will complain of “pins and needles” down the leg and confusion may happen with the patient being misdiagnosed as having lumbar disc herniation.

There are several tests commonly used to diagnose piriformis syndrome. The Lasegue’s Maneuver is used to reproduce the pain by flexing the hip to 90° and the knee extended—this test may also be



done with the patient on their side. The FAIR test is NOT the Faber test. The Faber test is used to diagnose SI joint problems. The FAIR test is a piriformis syndrome test. With the FAIR test, you will assess if stretching of the piriformis muscle is causing pressure on the sciatic nerve and the patient’s symptoms. To do this, you will flex, adduct, and internally rotate the hip. This maneuver will stretch the piriformis muscle and cause symptoms by compressing the sciatic nerve and place tension on the muscle and reproduce the patient’s symptoms. When the examiner places pressure on the posterior part of the buttock, the patient will complain of severe tenderness and pain.

Big Toe Pain

Big toe pain is fairly common, since the feet are constantly exposed to stress, overuse, and injury from walking, running, and other activities such as working and sports. When the big toe has limited movement, it is often associated with arthritis of the big toe.

Degenerative arthritis of the big toe is usually painful and associated

with stiffness and swelling of the first metatarsophalangeal joint. The patient may need a fusion of the joint. Arthritis of the big toe joint may be present with large dorsal bone spurs. This is referred to as hallux rigidus. This condition is associated with swelling and restriction of the dorsiflexion of the big toe.

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There will be some cartilage remaining within the joint space and there will be bone spurring around the joint dorsally. This condition is treated by an insert first, Morton's extension with stiff foot plate, and if this doesn't work, Dorsal Cheilectomy is done. During this procedure, 25% of the dorsal aspect of the metatarsal head is removed, including the dorsal osteophytes. The procedure is contraindicated if the pain occurs in the mid-range of joint motion.

This means that there is an advanced arthritis and the patient will need fusion of the joint, not just excision of the spurs and part of the diseased tissue.

Hallux Valgus (Bunion deformity) is a deformity characterized by the lateral deviation of the big toe with enlargement of the tissue around the metatarsophalangeal joint. Bunions can be painful and the pain may be aggravated by shoe wear. This condition is more common in women than in men. Once a bunion gets to be painful and shoe wear is uncomfortable, surgery may be needed.

The first metatarsal joint is the most common joint in the body to be affected by gout. Recurrent pain in the big toe can occur from gout. Gout is caused by the buildup of uric acid that looks like needles. These uric acid crystals are negatively charged. These gout crystals are usually deposited inside the joint, and the first metatarsophalangeal joint is a favorite joint for these crystals to be

deposited. Gout may resemble infection—sometimes there is a white tophus or cloudy aspiration. Aspiration and analysis of the joint fluid is the best method for diagnosis. X-rays will show punched-out periarticular erosions. Most people with high levels of uric acid will not have a gouty attack.

"Turf Toe" is the common term used to describe an injury to the plantar plate and sesamoid complex of the MTP of the big toe. It is an injury to the joint at the base of the big toe caused by hyperextension of the big toe and often occurs in contact sports. The term "turf toe" originates from playing in fields covered in artificial turf. This injury is seen more from playing on artificial turf since it is a harder surface than grass and will have less "give" when force is placed upon it. X-rays may show a fracture or displacement of the sesamoid. An MRI may show disruption of the volar plate.

There are two sesamoid bones—one tibial and one fibular. The sesamoid bones act like pulleys for the flexor tendons and are embedded into the tendons of the flexor hallucis brevis muscle. Sesamoiditis is generalized big toe pain at the bottom of the big toe. Sesamoids are important to the big toe region by absorbing weight-bearing pressure and reducing friction on the metatarsal head. They protect the flexor hallucis longus tendon as it glides between the two sesamoid bones. Any chronic sesamoid condition that is unresponsive to conservative treatment may require surgery.

Hangman's Fracture

A hangman's fracture refers to the bilateral fracture of the pars interarticularis. When this fracture occurs, the spinal canal is widened and there is a low risk for spinal cord injury. This fracture usually occurs due to motor vehicle accidents. Hyperextension will fracture the pars interarticularis with secondary flexion, injuring the disc and posterior ligament. The patient may have other associated spine fractures.

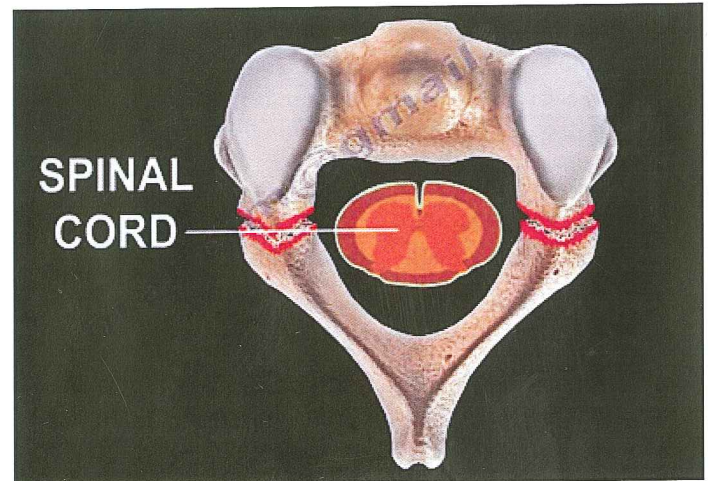
Hangman's fractures are identified by the Levine and Edwards Classification. Type I fractures are considered stable with less than 3mm displacement. There is no angulation and treatment is Cervical Orthosis.

Type II fractures are the most common type. These fractures are unstable and have significant translation and some angulation. To treat these fractures we use cervical traction to improve the displacement and immobilization in halo vest.

Type IIa fractures have slight translation but severe angulation, as seen in flexion distraction injuries with tearing of the posterior longitudinal ligament and the disc. This fracture is unstable and treated with reduction in extension and compression in a halo.

Do NOT use traction when there is severe angulation of the fracture.

A C2-C3 facet dislocation is classified as Type III. This is a rare fracture that results from initial anterior facet dislocation of C2 on C3, followed by an extension injury fracturing the neural arch. Results in translation with unilateral or bilateral facet dislocation of C2-C3.



This is an unstable fracture that is treated with surgery for reduction of the facet dislocation and stabilization of the injury.

A typical hangman's fracture displaces the vertebral body anteriorly and its posterior element posteriorly. This creates increased space for the spinal cord.

An atypical hangman's fracture line leaves the canal circumferentially intact, which puts the spinal cord at risk of injury if displacement occurs.

Sacral Sparing

Sacral sparing tests can be used to indicate the presence of an incomplete spinal cord injury. With a complete spinal cord injury, the patient will develop complete motor and sensory loss below the level of the injury. The bulbocavernosus reflex will be present, which means the patient is not in spinal shock.

After the spinal shock disappears as evidenced by the return of the bulbocavernosus reflex, the patient with apparent complete spinal cord injury must be examined carefully for evidence of sacral sparing. To test the bulbocavernosus reflex, you place one finger into the rectum and pull on the glans penis or the foley catheter and check to see if there is a reflex response with the finger in the rectum. The anal sphincter will not contract when the reflex is absent. The presence of any sacral sparing indicates an incomplete spinal cord injury.

Sacral sparing can be sensory, reflex, or motor. Sacral sparing can be evaluated through three tests of great toe flexor activity, rectal motor function, and perianal sensation. If the patient maintains sensation around the anal region, this is known as sacral sparing.

Sensory: S1: lateral heel S2: Popliteal Fossa S3: Ischial tuberosity S4-S5: Perianal/Genital Area

The area of S4-S5 perianal sensation is of most interest because the patient will not have any motor or sensory below the level of the lesion (check for sensation around the perianal area).



Sacral sparing indicates a favorable prognosis for recovery. The spinothalamic tract is near the corticospinal tract and preservation of the pin prick sensation will predict the recovery of some of the motor function. If the patient has sacral sparing, this is considered to be ASIA B. In ASIA B, the patient's injury is incomplete, which means there is no motor function below the level of the lesion.

Cubital Tunnel Syndrome

Cubital Tunnel Syndrome is a compression of the ulnar nerve at the elbow region. Cubital tunnel is not uncommon—it is the second most common nerve compression in the upper extremity after carpal tunnel syndrome. The ulnar nerve originates from the medial cord of the brachial plexus. The nerve runs down the arm where it passes under the medial epicondyle of the humerus. The ulnar nerve does not give any branches or innervations above the elbow. The ulnar nerve travels through a tunnel of tissue (cubital tunnel) that runs under the medial epicondyle. As the ulnar nerve passes behind the elbow, it may become compressed or irritated. The most common site of entrapment of the ulnar nerve is between the two heads of the flexor carpi ulnaris (FCU) muscle, or at the aponeurosis of the flexor carpi ulnaris. As the ulnar nerve enters the anterior compartment, it gives the innervation to the flexor carpi ulnaris and the medial half of the flexor digitorum profundus. Distally, the ulnar nerve supplies several muscles of the hand.

During the course of the ulnar nerve, it can become pinched at different sites: 1. Thoracic outlet syndrome 2. Cubital tunnel syndrome 3. Ulnar tunnel syndrome (guyon canal)

Causes of ulnar nerve entrapment around the cubital tunnel:

The Arcade of Struthers—different from the ligament of Struthers, the ligament of Struthers deals with median nerve compression. If you find a medial bony process in the distal humerus, this may give median nerve compression at the ligament of Struthers. However,

the Arcade of Struthers is a hiatus in the medial intermuscular septum which will pinch the ulnar nerve.

Another area of compression in the medial intermuscular septum is at the Osborn fasciae or ligament. The ulnar nerve can be compressed between the Osborne's ligament and the MCL. This can occur from a deformity of the elbow such as cubitus valgus. Entrapment may also occur due to a spur on the medial epicondyle.

Other conditions that can show up in the orthopaedic examinations:

- Elbow contracture release
- May want to release the ulnar nerve if the patient has symptoms
- The condition may worsen after doing elbow contracture release.

Patients may have ulnar nerve symptoms many years after a fracture of the lateral condyle of the humerus and nonunion will give the patient cubitus valgus and ulnar nerve symptoms years later.

The symptoms of cubital tunnel syndrome are worsened by performing activities that require bending at the elbow which stretches the ulnar nerve. Straightening the elbow or extending the elbow will relax the ulnar nerve. Pressure on the nerve at the elbow can cause numbness or pain in the elbow, hand, wrist, or fingers. The patient will describe symptoms of pain and numbness in the elbow as well as tingling in the ring and little fingers. The symptoms will get worse by excessive elbow flexion such as excessive use of a cell phone or by sports activities that require a lot of elbow flexion.

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THE UNIVERSITY OF TOLEDO
MEDICAL CENTER

Department of Orthopaedic Surgery
The University of Toledo
3000 Arlington Ave., MS 1094
Toledo, Ohio 43614



Cubital Tunnel Syndrome continued

The patient may get night symptoms. More severe symptoms of cubital tunnel syndrome include: • Weak or clumsy hand • Weakness affecting the ring and little fingers • Muscle wasting (first interosseus) • Claw hand deformity if compression occurs below the elbow. Claw hand will occur due to flexion of the fingers by a functional profundus muscle for the 4th and 5th fingers.

During the clinical examination, you will look for the Tinel's Sign at the elbow. The tapping technique is performed to test for symptoms of ulnar nerve entrapment at the cubital tunnel. Other tests include the elbow flexion test and Froment's sign. When testing for the Froment's sign, the thumb compensates to resist the pull on the paper by flexing the IP joint (occurs due to weak adductor muscles). You should also examine the patient for decreased sensation and clawing of the 4th and 5th fingers as well as wasting or atrophy of the first dorsal interosseous muscle.

Differential Diagnosis include: • C8 nerve root compression: Can occur due to cervical spine disc herniation. • Thoracic outlet syndrome: The lower trunk of the brachial plexus passes in this space and can be compressed in the area between the first rib, the clavicle, and scalene muscles • Pancoast tumor: Apical lung tumor

Conservative treatment methods include NSAIDs, elbow pads, therapy, and possible injections, as well as night bracing at 45° of extension with the forearm in neutral rotation. If surgery is necessary, the surgeon will perform a simple release with or without transposition. The type of transposition can be controversial.

There is a bad prognosis if there is intrinsic muscle atrophy. Surgery complications can occur and the most common complication is the injury to the medial antebrachial cutaneous nerve. Neurolysis is not helpful.

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Editors:

Dr. Nabil Ebraheim, Professor
and Department Chairman of
Orthopaedic Surgery;
Amanda Critton; and
Lauren Corba

Dr. Ebraheim, Amanda Critton and
Lauren Corba do not have any
relationships with industry to disclose.

**Department of
Orthopaedic Surgery**
The University of Toledo
3000 Arlington Ave., MS 1094
Toledo, Ohio 43614

For appointments, call
419.383.3761