



THE UNIVERSITY OF TOLEDO MEDICAL CENTER

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BY: NABIL EBRAHEIM, M.D.

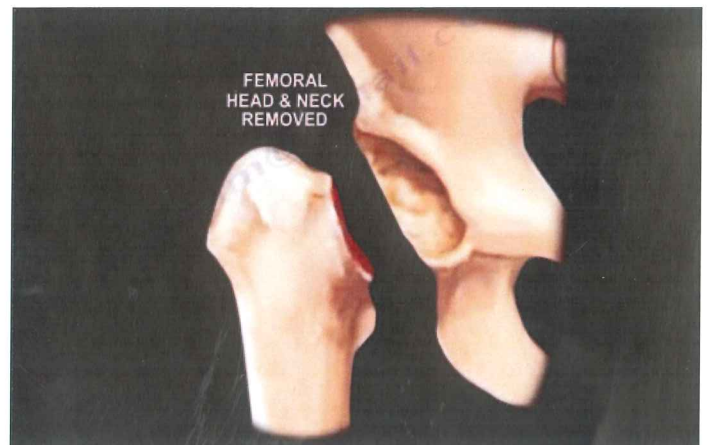
The Girdlestone Procedure

The Girdlestone procedure is a salvage procedure. It refers to the removal or resection of the head and neck of the femur. During this procedure, the diseased femoral head is cut with a bone saw and removed. Girdlestone is usually performed when the patient has a severely painful hip and a total hip replacement cannot be done due to severe infection of the hip. This procedure is also done in nonambulatory cerebral palsy patients with a painful hip dislocation or if a patient has selective tumors in the area.

This procedure may have a role in cases of displaced femoral neck fractures or in cases of failed internal fixation of femoral neck fractures in debilitated elderly patients. In elderly patients, hip prosthesis, either unipolar or bipolar (usually cemented), is the ideal surgical procedure for displaced femoral neck fractures. In an active elderly patient, a total hip replacement should be considered. Sometimes the medical condition and the age of the patient does not support or allow the use of a prosthesis in the elderly. The girdlestone procedure should be performed in some cases of displaced femoral neck fractures in the elderly, especially if the patient is debilitated and nonambulatory, and when the medical comorbidities are almost prohibitive for surgery. These medical conditions include: chronic renal failure (the worst), COPD, and congestive heart failure.

Even if the prosthesis could be done, the pre-injury cognitive and physical function is predictive of postoperative functional outcome after hip fracture surgery and this select group of patients will not be functional with the prosthesis. The purpose of the Girdlestone procedure is to decrease the pain and to preserve the life of the patient despite the considerable shortening of the extremity. It is an alternative to hospice or alternative care. It is the simplest and the least complex procedure for the patient.

The Girdlestone procedure can be performed anteriorly or posteriorly. The physician will not need traction post-operatively. The patient should be encouraged to move and get out of bed as soon as possible and physical therapy should be started early. The



patient should remain in a step down or ICU for a few days after surgery. The patient should be admitted by the geriatric services in cooperation with the trauma services. Surgery should be done within 48 hours or as soon as the patient is optimized medically, as this decreases the mortality rate. The mortality rate is 25% at one year and 6% during hospitalization. The pre-injury mobility is the most significant determining factor for post-operative survival. In patients with femoral neck fractures, surgery done on weekends was associated with an increase in hospital mortality rate, so it is better to do this surgery on week days. If you try to do a simple procedure such as fixation of the displaced femoral neck fracture, this failure rate is about 46% with fixation techniques in the elderly. There is a growing number of people over 90 years of age who will suffer from femoral neck fractures and these patients will need decisions and appropriate care for their situation. Advanced age is associated with increased mortality and poor functional recovery, so it is necessary for physicians to approach the increased number of femoral neck fractures in the elderly and I think that Girdlestone procedure should be utilized in some select indications.

Jersey Finger

Jersey Finger is an avulsion of the flexor digitorum profundus from its insertion at the base of the distal phalanx. This injury occurs in

Zone I, which is located from the insertion of the flexor digitorum superficialis distally.

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The ring finger is affected in about 75% of patients. The mechanism of injury is a forced extension of the flexed finger by violent traction on a flexed distal phalanx. Jersey finger typically occurs in sports such as football by grabbing of the opponents jersey who is pulling or running away. The flexor digitorum profundus has a dual innervation. The FDP muscle is supplied by the anterior interosseous nerve and by the ulnar nerve. The FDP is innervated by the lateral part of the anterior interosseous branch of the median nerve and the medial part of the ulnar nerve. The tendon may be torn from the distal phalanx or it may avulse with a bony fragment. The FDP tendon could retract at different levels. The tendon usually retracts to about the level of the PIP joint and it stops at the passage through the FDS tendon. The tendon could retract into the palm and the blood supply can be compromised.

FDP tendon injuries are classified by the Leddy Classification. Type I injuries are identified by the tendon being retracted into the palm. Treatment is usually surgery performed within 10 days. Treatment is urgent due to disruption of the blood supply. Type II injuries are identified by the FDP tendon retraction to the level of the PIP joint. Type II injuries may be repaired within a few weeks. Type III injuries are classified by the large avulsion fracture which limits retraction to the DIP. Type IV injuries are identified by the bony avulsion fragment plus avulsion and retraction of the tendon which may go to the palm.

During examination, the finger lies in slight extension relative to the other fingers in the resting position and there will be an inability to flex the finger DIP (no active DIP flexion). The patient may have tenderness along the retracted flexor tendon proximally. The physician will need to check the integrity of the FDP tendon and should hold the PIP straight and flex the DIP. If the patient can flex the DIP joint, then the FDP is intact. When there is a FDP tendon avulsion, the patient will be unable to actively flex the DIP. The physician should check the integrity of the FDS tendon. Hold the

MCP straight and flex the PIP or hold all fingers in extension except the affected one and flex. On an x-ray, you may see an avulsion fracture.

Treatment of Jersey Finger will be in the form of a direct tendon repair. A dorsal button may be used if the injury is less than 3 weeks. If you advance the tendon more than 1 cm it may lead to quadriga or DIP flexion contracture. Open reduction and internal fixation of the fracture fragment is usually done in Type III and Type IV fragments. In Type IV, fix the fracture first then repair the tendon to the bony fragment. If the chronic injury is more than 3 months and if there is stiffness of the DIP, do arthrodesis of the DIP and fuse the DIP. Two stage flexor tendon grafting is done in the chronic injuries more than three months old and in young patients with full passive range of DIP. Two stage flexor tendon grafting may also be done to excise the palmar mass. Two stages are used because the pseudosheath formed around the implant in the first stage usually reduces the formation of post-operative adhesions to the tendon graft in the second stage.

Differential diagnosis include Mallet Finger and Boutonniere deformities. Mallet finger is an avulsion of the insertion of the extensor digitorum longus tendon. The patient will be unable to actively extend the distal phalanx and the finger will assume a flexed position.

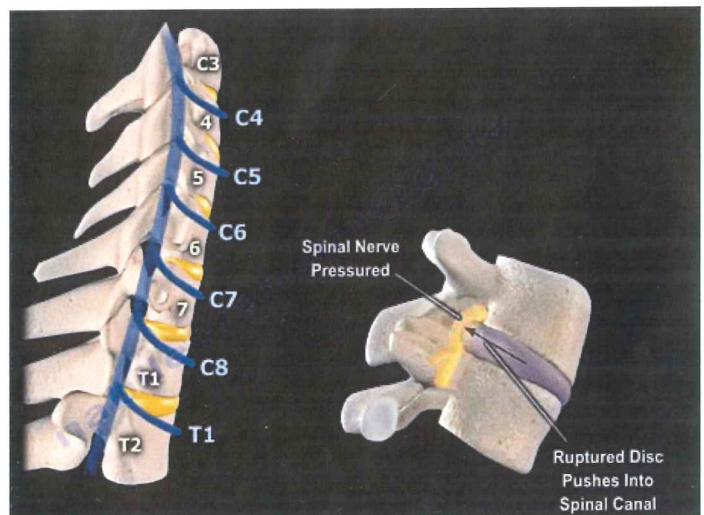
A Boutonniere deformity is a chronic rupture of the central slip of the extensor tendon. Flexion will be found at the PIP joint and extension of the DIP and MCP joints. When the central slip is ruptured acutely, there will be no active PIP extension, but the passive PIP extension will be present. As the condition progresses and becomes chronic, both active and passive PIP extension may not be present. Both Mallet finger and Boutonniere deformities are extensor tendon injuries. The Jersey Finger injury involves an avulsion of the flexor digitorum profundus tendon.

Neck Pain, Cervical Disc Herniation, and Radiculopathy

Cervical disc herniation occurs most frequently at the level of C6-C7. It also can occur at C5-C6. The patient will complain of neck pain due to nerve root irritation with pain radiating to the ipsilateral upper extremity. The patient may complain of numbness, paresthesia, and weakness. Coughing, sneezing, and neck movements make the pain worse. A careful examination of the patient is important. Each nerve involved will show its effect on the motor power, the sensation, and the reflexes. A herniated disc at the C3-C4 bulge will affect the C4 nerve root and cause a sensory deficit around the shoulder area.

Additionally, the diaphragm is largely supplied by the C4 nerve root, which could affect the respiratory system. A herniated disc at the C4-C5 bulge affects the C5 nerve root and can affect sensation around the shoulder area. The biceps reflex is primarily C5 and will affect the motor functions of the deltoid and in elbow flexion.

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A herniated disc at the C5-C6 bulge will affect the C6 nerve root. A herniated disc here will affect the sensation in the index finger and the thumb, the brachioradialis reflex, as well as C6 wrist extension and elbow flexion. A herniated disc at the C6-C7 bulge affects the C7 nerve root, and will cause sensory issues at the middle finger. Motor functions of elbow extension (triceps) and wrist flexion and finger extension will be impaired. The brachioradialis (C6) and triceps (C7) reflexes will be additionally affected. A herniated disc at

the C7-T1 bulge affects the C8 nerve root and will cause sensory issues of the medial two fingers and the medial part of the forearm. A bulge here will affect the motor functions of C8 finger flexion. A herniated disc at the T1-T2 bulge will affect the T1 nerve root, this will affect the motor functions of the T1 interossei muscles (abduction and adduction)—the patient will not be able to spread the fingers or bring them closer together.

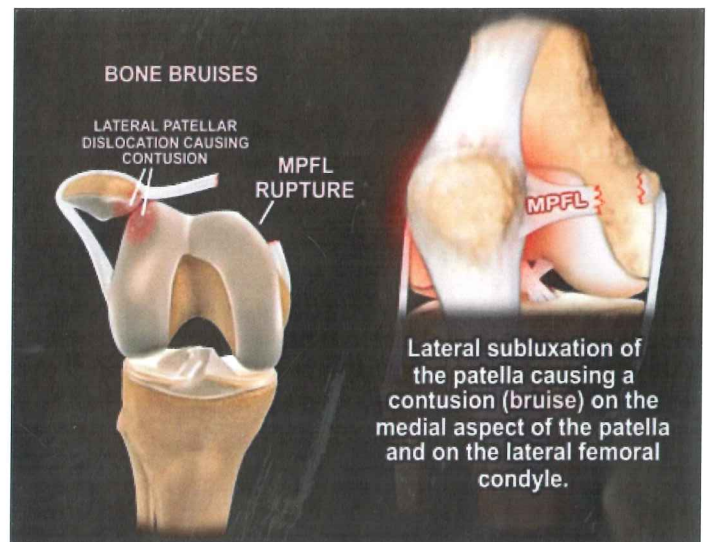
Avulsion Fractures and Bone Bruises Around the Knee

A medial collateral ligament avulsion occurs with a piece of bone from the femur. In these cases, it is known as a proximal avulsion fracture. In patients with Pellegrini-Stieda Syndrome, injury is sometimes indicated by calcification occurring on the medial epicondyle. Chronic calcification will be seen on x-rays of the medial epicondyle of the femur.

Anterior Cruciate Ligament Avulsions occur from a piece of bone from the tibial eminence anteriorly. Avulsion of a piece of bone can be seen on AP and lateral view x-rays. An ACL avulsion fracture may be an isolated injury or it may be associated with other injuries and fractures such as tibial plateau fractures. Tibial spine fractures in children mimics ACL avulsion fractures in adults.

Posterior Cruciate Ligament (PCL) Avulsions occur from a piece of bone posteriorly from the tibia. This is the most common presentation of avulsion of the PCL. A Fibular Head Avulsion (Arcuate Sign) fracture will indicate that the posterolateral corner is involved. The arcuate sign should be recognized as a significant injury. Sometimes, the avulsed piece is too small and the injury can be missed. If not diagnosed and dealt with properly, then posterolateral instability of the knee can occur. Failure of diagnosis may result in failure of future fixation of the cruciate ligaments due to posterolateral corner instability left untreated.

The arrangement of the insertion of the ligaments or tendons into the fibular head from anterior to posterior are as follows: the lateral collateral ligament, popliteofibular ligament, and biceps femoris tendon. ACL tears may cause bone bruises laterally on the middle of the femoral condyle and on the posterior aspect of the tibia laterally.



In order to determine whether or not it is lateral, you will look at the fibula. The provider should check the fibula on an MRI. Bone bruises laterally indicate an ACL tear. Fat within the aspirate of the knee indicates an occult fracture. Because fat is less dense than blood, it floats on the surface. The presence of fat/fluid level is diagnostic of a fracture, even if a fracture is not seen on an x-ray (occult). The fat/fluid level is seen in some cases of tibial plateau fractures, chondral injuries, and patellar fractures (not seen on x-rays). Liphemarthrosis is seen best with a cross table lateral view of the knee.

Cervical Spine Examination

The Lhermitte's Sign is an electric shock sensation which occurs with neck flexion and often radiates down the spine. In some cases, this sensation goes to the extremities. This sign is associated with cervical myelopathy and multiple sclerosis. It is probably caused by hyperexcitability of the nerves which have become demyelinated. There is a difference between cervical radiculopathy and cervical myelopathy. In cervical radiculopathy, there is a dermatomal pain distribution. If the pain radiates to the thumb and index finger, this is probably a C6 nerve root irritation. If the pain radiates to the

middle finger, this is probably a C7 nerve root irritation. If pain radiates to the 4th and 5th fingers, this is probably a C8 nerve root irritation. If the pain goes to the C7 dermatomal area, then the disc herniation is between C6 and C7, affecting the C7 nerve root. There are two tests frequently used during a cervical spine examination to help diagnose cervical radiculopathy.

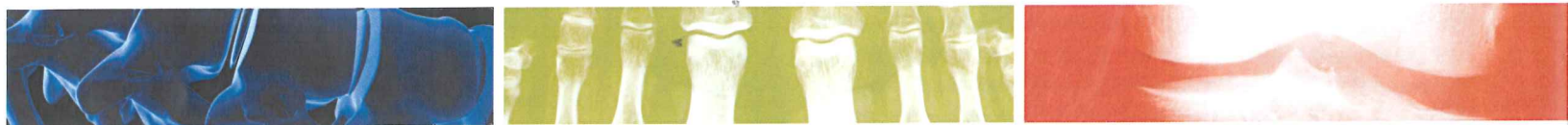
The Spurling's Sign is pain exacerbated by neck extension, neck bending, and rotation towards the symptomatic side.

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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



Cervical Spine Examination continued

The shoulder abduction test is performed by putting the hand of the patient above the shoulder, usually above the head, and this will relieve the pain. This is a sign of cervical spine radiculopathy. This test differentiates spine pathology from shoulder pathology. In cervical radiculopathy, there will be other findings of nerve root irritation such as numbness, paresthesia, weakness, and hyporeflexia.

Cervical myelopathy usually occurs due to compression of the spinal cord. In cervical myelopathy, pain is usually not the predominant feature. Pain is usually absent or poorly defined with vague sensory and motor changes. The patient may have discomfort with a dull, aching pain or sometimes a sharp pain. The patient will have signs and symptoms of upper motor neuron lesions, such as gait disturbances (wide or ataxic gait), and poor hand dexterity (buttoning and unbuttoning a shirt, writing, or holding a mug). Pathological long track signs will be seen consisting of the Hoffman's Sign, Babinski reflex, Clonus Sign, Finger Escape Sign, and Lhermitte's Sign, in addition to Hyperreflexia. When you examine the patient, the patient will have hyperreflexia and a positive Hoffman's Sign. The Hoffman's Sign is done by flicking the nail of the middle or ring finger. This will produce flexion of the index finger to the thumb. There may also be a positive Babinski sign. Lateral stimulation of the plantar surface of the foot elicits toe extension. Neck flexion causing electric shock sensation and paresthesia radiating down the spine and the extremities. A positive Clonus Sign is a sign of upper motor neuron lesions. The Clonus Sign is a nonvoluntary, sustained movement of the ankle muscles with firm, passive, continuous stretch.

Myelopathic Hand Syndrome may be indicated with Thenar atrophy. A positive finger escape sign occurs when the patient tries to keep the fingers extended, the ulnar digits tend to abduct. The positive grip release test occurs when the patient has trouble making a fist and fully extending the fingers (doing this 20 times in 10 seconds is normal). An MRI is the best study for cervical disc disease.

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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