



THE UNIVERSITY OF TOLEDO  
**MEDICAL CENTER**

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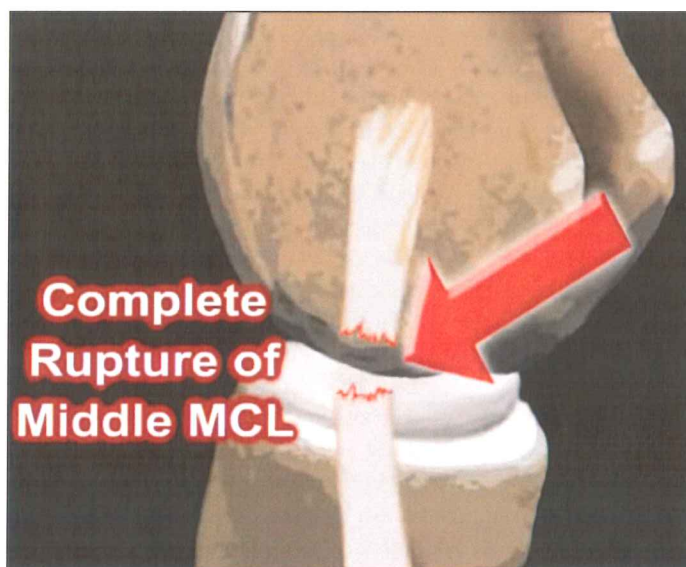
# ORTHOPAEDIC MONTHLY

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**BY: NABIL EBRAHEIM, M.D.**

## Medial Collateral Ligament Injuries

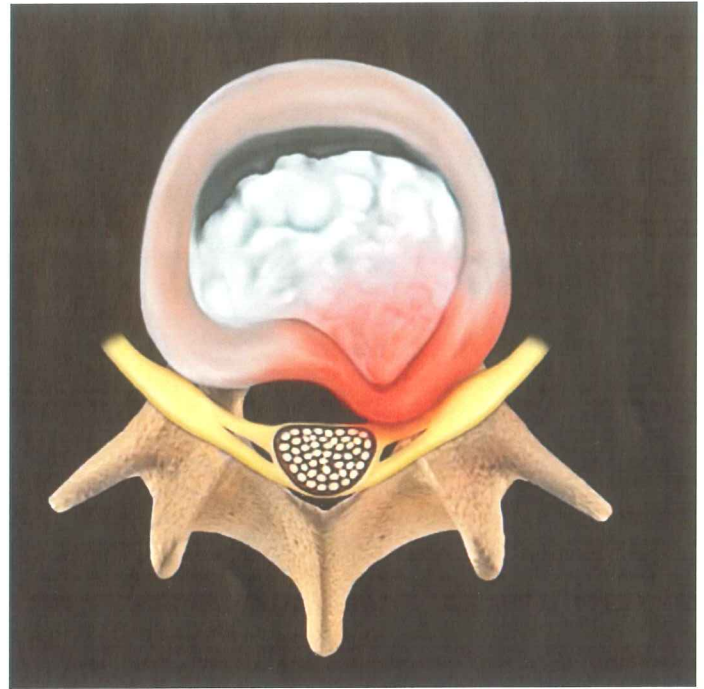
The medial collateral ligament (MCL) is one of four major ligaments of the knee. The MCL extends from the medial epicondyle of the femur to below the medial condyle of the tibia. The MCL is a static stabilizer composed of superficial (primary) and deep (secondary) portions that are restraints to valgus stress. The superficial MCL is the primary restraint to valgus stress. The proximal attachment is located on the posterior aspect of the medial femoral condyle. The distal attachment is located at the metaphyseal region of the tibia, about 5cm distal to the joint, lying beneath the pes anserinus. The Deep MCL assists as a secondary restraint to valgus stress. The Deep MCL inserts directly into the edge of the tibial plateau and meniscus. It may be separated from the superficial layer by a bursa. The joined tendons of the sartorius, gracilis, and semitendinosus muscles cross on top of the lower part of the MCL. The pes anserine bursa is located anterior to the insertion of the MCL into the tibia. The MCL's primary function is to be a restraint to valgus stress. The MCL is the most commonly injured ligament of the knee. The typical mechanism of injury of the MCL is due to a valgus and external rotation force. A direct blow to the knee usually causes a complete rupture of the MCL. Rupture may occur proximally or distally. Tears of the proximal MCL have a greater healing rate; however, tears of the distal MCL may not heal well (similar to a Stener lesion of the thumb). Injury to the ACL comprise up to 95% of associated injuries. Rupture of the ACL causes anterolateral rotatory instability. The majority of MCL injuries that are associated with ACL injuries are Grade III complete ruptures. Up to 5% of isolated MCL injuries are associated with meniscal tears. MCL sprains are classified into three different grades. Grade I injuries are a sprain or stretching injury. Grade II injuries consist of a partial tear of the MCL. Grade III tears are a complete tear of the ligament with no end point with valgus stress at 30° of knee flexion. A MCL injury will typically create a "popping" sensation. Pain and tenderness is usually found higher than the joint line. During the physical examination, tenderness will be discovered along the medial aspect of the knee. A positive valgus stress test at 30° of knee flexion indicates injury to the superficial MCL. Opening around 1 cm indicates a Grade III complete tear of the MCL. A positive valgus stress test at 0° of knee extension indicates posteromedial capsule or cruciate ligament injury in addition to MCL injury (combined injury). The physician should always evaluate for other injuries to the ACL, PCL, or medial meniscal tear. Radiographs are usually normal; however,



they may show calcification at the medial femoral site (Pellegrini-Stieda Syndrome). Calcification is due to chronic MCL deficiency at the medial femoral insertion site. A pediatric patient with a knee injury and a suspected salter fracture should have stress view x-rays performed to rule out a growth plate injury. Growth plates are weaker than ligaments and it may be more beneficial to have an MRI performed rather than stress view x-rays. An MRI is the study of choice as it identifies the location and extent of the MCL injury. Treatment typically consists of NSAIDs, rest, and therapy. A minor sprain of the MCL will require therapy with a return to play in about a week. A brace may be used if the injury is classified as a Grade II and they will return to play in about 2-4 weeks. With Grade III injuries, there will be a return to play in about 6-8 weeks. Surgery is performed in Grade III injuries with a multiple ligament injury, especially with distal avulsion fractures. If there is chronic instability with opening in full extension, a reconstruction should be performed. An additional arthroscopy may be needed to rule out associated injuries. In combined MCL and ACL injuries, usually surgery for the ACL is delayed until the MCL heals (up to eight weeks) and then an ACL brace should be used. Complications consist of stiffness and loss of motion. Laxity is associated with distal MCL injuries. Functional bracing may reduce an MCL injury in football players, particularly with interior linemen.

# Acute Low Back Pain Lumbar Disc Herniation

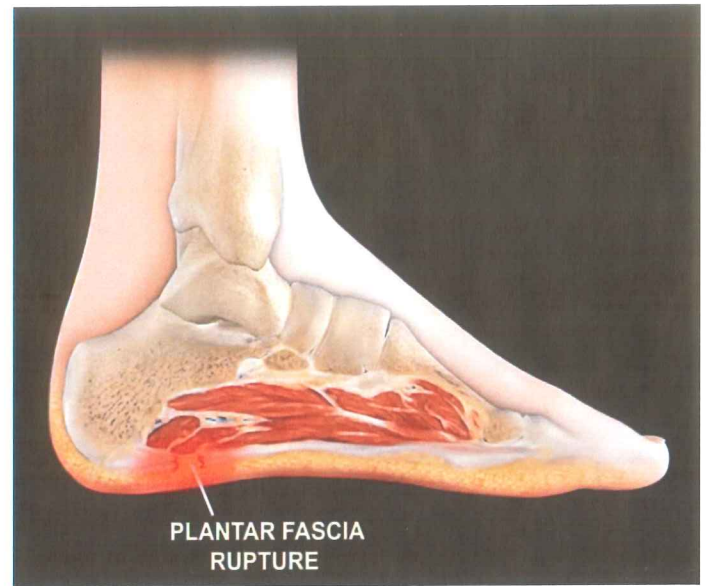
Low back pain is a common condition. 90% of patients with low back pain will improve without surgery. Usually they get better with spontaneous resolution of the symptoms within 12 weeks. We usually advise the patient for early return to activity and function as the symptoms and the pain permits. The risk factors for development of low back pain are numerous, some include: vibration exposure, poor physical fitness, smoking and obesity, anxiety and depression, job dissatisfaction, or repetitive bending or "stooping" on the job. The worst pressure on the disc occurs with prolonged sitting and bending over. This is the position that produces the highest pressure on the disc. If a patient has back pain but no radiation, by the patient's history or physical examination and there are no red flags, then there is no reason to get x-rays or MRI early in the treatment of the patient. Red flags include a history of trauma, a tumor, infection, or Cauda Equina Syndrome symptoms. To rule out a history of trauma you should rule out fractures with x-rays, MRI, or CT scans. Tumors are a risk if the patient is older than 50 years old, if the patient had weight loss, or if the patient has pain at rest or at night. An infection may be present if the patient has fever and chills, if the patient has a history of diabetes, or if the patient has a history of IV drug abuse. Cauda Equina Symptoms may be present if the patient has back pain more than leg pain or if the patient also has bladder and bowel symptoms. Cauda Equina Syndrome needs to be diagnosed and surgically treated early. An MRI needs to be ordered urgently in the course of treatment. The MRI should be ordered STAT. There may need to be a wet read; a wet read is an early preliminary read of the radiographs. A wet read needs to be communicated with the physician and can be done while the patient is still on the table of the MRI. In summary, if the patient has no red flags and has a normal neurological exam, there is no reason to get early radiological studies. Getting early x-rays and early MRIs leads to a better patient satisfaction but does not give a better patient outcome. If there is no specific pain pattern, then there is no need for further workup. MRIs are good studies, but they give false positives. There is degeneration or a bulge of a disc in 35% of all asymptomatic subjects between 25-39 years of age. In patients 60 years old or older, the majority of the patients will have changes in the MRI. MRI abnormalities are common and must be correlated with the age and the clinical signs and symptoms of the patient. An MRI is good for diagnosing the lumbar disc herniation, which is sometimes called a ruptured disc, a slipped disc, or a herniated disc. The most common location of a disc herniation is a posterolateral herniation involving one nerve root. A foraminal L4-L5 herniation occurs in about 8%-10% of the cases. It involves the exiting nerve. A central herniation involves multiple nerve roots. It predominantly causes low back pain more than leg pain. It may



cause bladder and bowel symptoms. This type of disc herniation causes Cauda Equina Syndrome which needs urgent diagnosis and surgical treatment. Clinical evaluation for a herniated disc examines sensory and motor reflexes. The Straight Leg Raising Test is the most important finding. It can be done in either the sitting or supine position. The test is positive as indicated by pain in the leg when the patient's leg is raised to flex the hip with the knee extended. A positive straight leg test means a tension sign, something is putting tension or stress on the sciatic nerve. When the test is positive, it indicates possible disc herniation. Treatment is typically non-operative. First, reassure the patient. Let the patient take some rest (no more than a few days), give the patient anti-inflammatory medication, and instruct them to attend physical therapy. Indications for surgery include progressive neurological deficits, Cauda Equina Syndrome, the patient is not getting better with time and treatment or if the symptoms are not getting better with conservative treatment, or the patient has a positive tension sign with persistent severe pain. Patients with sciatica and positive tension signs or patients with positive neurological findings on clinical exam with positive MRI findings make ideal surgical candidates. Surgery results in relief of leg pain in the majority of patients. Back pain may persist in some patients. Surgery results in neurological improvement, 50 % motor and sensory and 25% reflexes. In patients with discogenic back pain, they may need fusion which is a major procedure.

# Rupture of the Plantar Fascia

Plantar fascia rupture is not a very common injury, and it has the characteristic of acute pain in the arch of the foot. It occurs due to a tear in the plantar fascia, and that tear is painful. Rupture is often associated with long standing flat feet deformity or can occur from steroid injections. Another predisposing factor for plantar fascia rupture is plantar fasciitis. The plantar fascia is formed by three bands: the medial, the central, and the lateral. The plantar aponeurosis is the central part of the plantar fascia. The plantar fascia is inserted into the medial tuberosity of the calcaneus and extends distally, becoming broader and thinner. The plantar fascia acts as a bow string. The rupture of the plantar fascia may be misdiagnosed as plantar fasciitis. When the plantar fascia tears, the patient will describe a tearing pain that usually occurs during athletic activity. The tear may be complete or incomplete. Complete tear of the plantar fascia occurs from sudden trauma or injury. The patient feels "popping" or "snapping" suddenly. Walking will be very difficult with tenderness, swelling and significant bruising on the sole of the foot (the condition is painful). Some patients may have a noticeable tightness of the calf muscle (equinus contracture) in association with rupture of the plantar fascia. Partial rupture is less common and occurs from overuse, as in running. MRI will identify the rupture, and it can also identify if the rupture is partial or incomplete. Rupture is often in the arch of the foot opposed to where the plantar fascia inserts into the heel (calcaneus). Ultrasound has the same accuracy as MRI for imaging the plantar fascia. Interpretation of the plantar fascia rupture may be difficult. You may need dynamic maneuvers with dorsal flexion of the forefoot to stretch the plantar fascia. Usually the proximal part of the plantar aponeurosis is clearly



visualized on ultrasound. MRI is probably better in diagnosis of plantar fascia rupture. Treatment of plantar fascia rupture includes non-weight bearing for 2-3 weeks, a walking boot, crutches, physical therapy, and as a last resort-surgery. Surgery can be used in some athletes who continue to have pain despite a well conducted conservative treatment. Surgery is done to release the fascia and to excise the scar. Patients with rupture of the plantar fascia typically achieve a favorable outcome with return to full activity.

## DISH Diffuse Idiopathic Skeletal Hypertosis

Diffuse Idiopathic Skeletal Hypertosis, or DISH, has flowing ossification along the anterolateral aspect of at least four continuous vertebrae. When you look at the x-ray, you find ossification along the anterior aspect of the body but separate from the vertebrae, and the disc height is preserved. It occurs in older patients (50 years and above). It affects all of the spine (more in the thoracic spine), especially on the right side, which is typical of DISH. The syndesmophytes are equal on the right and left sides in the lumbar and cervical vertebrae. There is no involvement of the discs, and there is no facet fusion or sacroiliac joint involvement. The patient may have other comorbidities such as gout or diabetes, and you need to get the hemoglobin A1c (HbA1c test) in these patients. Some patients may have high cholesterol levels. The patient will complain of back pain and spinal stiffness. DISH will have large syndesmophytes, and if the condition occurs in the neck, it will

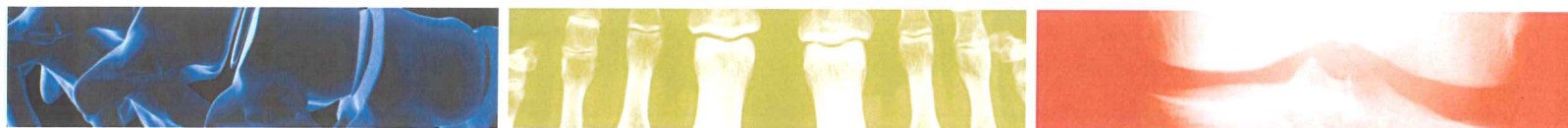
cause dysphagia, hoarseness of the voice, and sleep apnea. Diagnosis can be established by x-ray of the spine. On lateral x-ray of the cervical spine, you will find anterior bony fragments, and the discs are preserved. The fractures in the spine are usually due to a hyperextension injury and can be occult, resulting from minor trauma and may have major instability. There is an increased mortality in c-spine trauma in DISH, high mortality especially in non-operative treatment. If the patient has a history of sudden neck or back pain, then the patient will be assumed to have an occult fracture, so try to get a CT scan or an MRI even if the pain is minimal and even if the x-rays appear normal. Heterotopic ossification after total hip arthroplasty is more common in patients with DISH.

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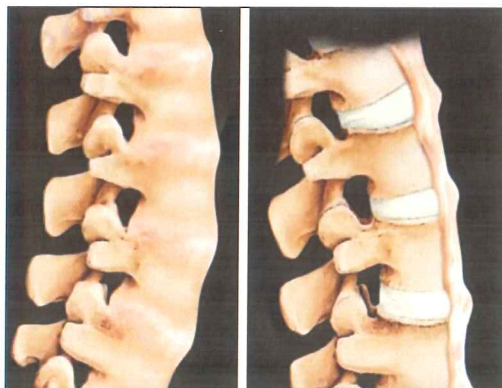
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*DISH Diffuse Idiopathic Skeletal Hypertosis continued*

## **DISH Diffuse Idiopathic Skeletal Hypertosis**

DISH has flowing large syndesmophytes, does not have bamboo spine, the sacroiliac (SI) joint will not be involved, it occurs in older patients, and some patients may have diabetes. Ankylosing Spondylitis has diffuse ossification of the disc space without large osteophytes, it has bamboo spine, the patient is usually young, the sacroiliac (SI) joint is involved, the HLA-B27 is positive about 90% of the time, and they have limited chest expansion.



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MONTHLY**

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