



THE UNIVERSITY OF TOLEDO MEDICAL CENTER

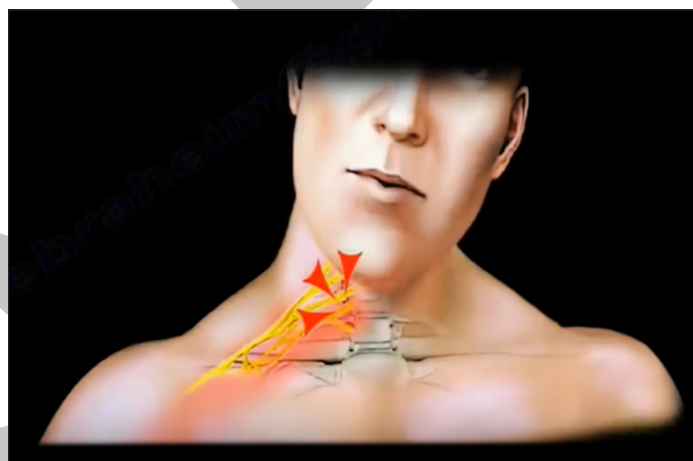
# ORTHOPAEDIC MONTHLY

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BY **NABIL A EBRAHEIM**

## Stinger Burner Injury

A stinger or burner injury is a common transient injury that occurs in contact sports such as football. It is a transient unilateral brachial plexus neuropraxia, and it is usually mild. It occurs due to compression, traction, or from a direct blow to the brachial plexus. The upper trunk (C5-C6) is usually affected. The muscles that are usually affected are the rotator cuff muscles, the biceps, and the deltoid. The patient will complain of burning pain, paresthesia, numbness, and weakness with painful symptoms starting above the shoulder and going down the arm. It is really a sharp burning of the involved side with full pain free range of motion of the cervical spine. The symptoms will start immediately after the trauma occurs and will usually last several minutes. The symptoms usually resolve themselves. It is a transient neuropraxia of the brachial plexus. It is not a spinal cord injury, and it is not transient quadriplegia. It is really a unilateral paresthesia and tingling in the arm that resolves quickly in minutes and the cervical spine range of motion is O.K. the unilateral weakness will be in the deltoid and the biceps. An athlete can return to play when there is complete resolution of the symptoms, normal strength, and range of motion of the cervical spine with full sensation. You should study the patient more if the episode lasts longer, if it is bilateral, if it affects the lower extremity, if the patient has neurological deficit, or if the condition is recurrent. Get an x-ray. You get the x-rays to rule out fracture or spinal canal stenosis. Get an MRI. The MRI will rule out disc herniation, cervical stenosis, or spinal cord injury. Get an EMG. If the symptoms last more than three weeks, then you get an EMG, and you will probably find brachial plexus or peripheral nerve abnormality. If the patient has one stinger, then this will increase the



risk for the patient by three times to have another stinger. In patients with burners who have recurrent symptoms or people with recurrent burners, there should be a work-up for cervical canal stenosis and foraminal stenosis because there is an increased risk of injury. The treatment for a stinger is to remove the player from competition and rest the arm until the systems resolve. If it is the player's first time have a stinger, then the athlete can return to play when the symptoms resolve. If it is not the athlete's first stinger, the athlete can return to play when the symptoms completely resolve if the athlete had less than three previous stingers that last less than 24 hours. The athlete may need further testing if the symptoms last longer than 24 hours or if there has been more than three previous stingers.

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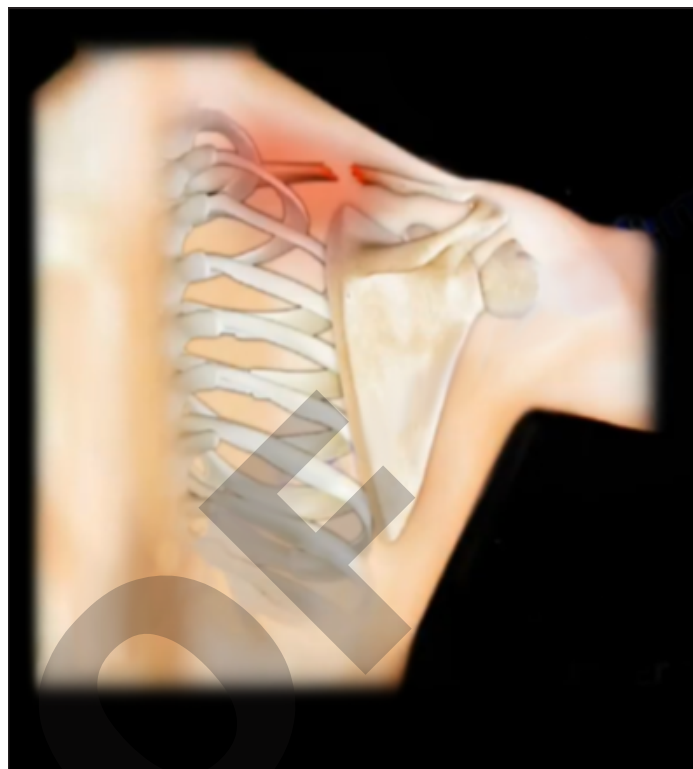
## Scapulothoracic Dissociation

The scapulothoracic joint is where the problem of the dissociation occurs. The scapulothoracic dissociation is a rare entity that consists of disruption of the scapulothoracic articulation. The scapulothoracic dissociation is a traumatic lateral displacement of the scapula with intact skin. It is described as a closed, traumatic four-quarter amputation (serious injury). The skin around the shoulder

area is bruised but intact. There will be closed avulsion of the scapula with an associated clavicle fracture, sternoclavicular disruption, or acromioclavicular joint separation. Clavicle fracture is the most common associated injury. This entity can be associated with upper extremity fractures such as fracture of the scapula, clavicle, and humerus.



Most often there is varying degrees of injury to the brachial plexus and the subclavian artery, resulting in a flail, pulseless upper extremity. The most important initial step is to rule out vascular injury which is common in this situation. You may find reduced pulses or no pulses in the upper extremity. The subclavian artery is most commonly injured. Get brachial brachial index. Do arteriography and immediate repair. Angiography should be performed to diagnose the vascular injury. Neurologic injury occurs in up to 90% of the time; it is a brachial plexus injury. The neurologic injury determines the functional outcome for the patient. Flail arm occurs 50% of the time; the return of any neurologic function is unlikely. Amputation occurs 20% of the time. Death occurs 10% of the time. This injury can be missed. The chest x-ray will show significant lateral displacement of the scapula. If you see a distracted clavicle in a chest x-ray, be concerned. If you see more than one centimeter displacement of the medial edge of the scapula from the spinous process compared to the other side, be concerned. Here you can see scapulothoracic dissociation with a distracted clavicle fracture. Start the treatment with advanced trauma life support. Airway, breathing, circulation. Do angiography and repair of the artery if needed. Do open reduction internal fixation of the clavicle if vascular repair is indicated. If a patient has a humeral shaft fracture, the treatment is not a brace because functional brace of the humerus will not work in a patient with brachial plexus injury. Do early above elbow amputation and shoulder fusion based on the degree of neurovascular and scapular muscle damage.



## Total Knee Arthroplasty & Peroneal Palsy

We should be counseling the patient preoperatively on the risk of total knee arthroplasty. The patient should be informed that there is a higher risk of peroneal palsy in patients with valgus deformity than the typical patient. Peroneal palsy can occur in patients with a large valgus deformity and flexion contracture (more than 20 degrees). The common peroneal nerve is one of the terminal branches of the sciatic nerve that innervates the lower extremity. The common peroneal nerve has two parts, the deep peroneal nerve and the superficial peroneal nerve. The main muscles that are innervated by the superficial peroneal nerve are the peroneus longus and the peroneus brevis. The main function of these muscles is eversion of the foot. The main muscles supplied by the deep peroneal nerve are the tibialis anterior, extensor digitorum longus, and extensor hallucis longus. The function of these muscles is dorsiflexion of the ankle and toes. The peroneal nerve is tethered at the fibular head and correction of the valgus deformity and the flexion contracture at the time of total knee arthroplasty can stretch the nerve and can lead to peroneal palsy. A combination of flexion and valgus deformity preoperatively is most frequently associated with post-operative peroneal palsy. So this common peroneal nerve injury predominantly affects the patient that has lateral compartment arthritis. If the patient has a preoperative varus knee, but the patient was unable to extend the toes, or dorsiflex or evert the ankle post-operatively, then this peroneal nerve injury probably occurred from

bad placement of the retractors during surgery. If you have an indwelling femoral nerve catheter for post-operative pain, post-operatively the patient is unable to dorsiflex the toes or the ankle and there is decreased sensation of the first web space, then this clinical picture is not from the femoral nerve block or from the catheter (probably due to peroneal nerve injury). The presentation of peroneal nerve palsy usually occurs acutely after surgery, but it may be delayed. Residual weakness of the extensor hallucis longus muscle is the most common long term complication following total knee replacement when the peroneal nerve was injured. Other risk factors of peroneal nerve palsy include use of epidural anesthesia, previous spinal surgery (double crush- one from the spine and one from the peroneal nerve around the knee), patients with peripheral neuropathy, and patients with high tibial osteotomy. Examine the patient and distinguish between partial or complete peroneal palsy. Preservation of the function of the peroneus longus and peroneus brevis will indicate partial injury (the deep peroneal nerve is only affected, the superficial peroneal nerve is not affected). If you find that there is peroneal palsy, remove the dressing to release any compressive dressing and then flex the knee. Give the patient a foot drop brace, get an EMG in about 3-4 weeks, physical therapy, avoid equinus contracture, and if no improvement in 3 months, explore and decompress the nerve. When you explore the nerve, the nerve and all its branches may need to be released.

# Hip Dislocation

Hip dislocation can be a simple dislocation, or it can be a fracture dislocation that involves the femoral head or the posterior wall of the acetabulum. Dislocation of the hip is usually a posterior type, however, in rare situations it can be an anterior dislocation. In posterior dislocation of the hip, the lower limb will be flexed, adducted, and internally rotated. In anterior hip dislocation, the lower extremity will be extended, abducted, and externally rotated. The extremity will not be extended, as in other types of anterior dislocation of the hip. Hip dislocation of any type is an emergency. It must be reduced in less than 6 hours of injury. After reduction of the hip, get a CT scan to see any loose fragments in the joint. You will get an x-ray first, and then get CT scans. The CT scan will clearly outline the bony injury. CT scan is helpful to check for congruous reduction, for absence of fracture, absence of marginal impaction, or absence of loose fragment pieces inside the joint. Marginal impaction is more common in posterior acetabular wall fractures and could lead to instability and if it is not recognized, it can lead to instability of the hip. The size of the posterior wall fracture has an affect on the stability of the hip joint. If the patient has an irreducible dislocation of the hip, then you need to do an emergency surgery to reduce the hip. Reduction of the hip cannot wait till tomorrow or even the day after tomorrow, it has to be done urgently. Hip dislocation with or without associated fracture can cause complications. The risk of avascular necrosis depends on the interval between the injury and reduction of the dislocation. Urgent reduction of the hip dislocation is mandatory to avoid these complications posterior hip dislocation can also cause sciatic nerve palsy. Reduce the hip and recheck the sciatic nerve function. Always reduce the hip early. Closed reduction should be done in less than 6 hours. Check the sciatic nerve before reduction and after reduction. When injury occurs to the sciatic nerve due to posterior hip dislocation, the common peroneal nerve is usually affected, causing weakness in dorsiflexion of the ankle and loss of toe extension. Injury can occur in varying degrees of severity, and it can be missed. Check for foot drop and check for sensation in the first web space. Injury to the sciatic nerve usually occurs from the dislocation and not from the reduction of the hip. The length of time that the hip remains dislocated influences the incidence, and the severity of a major sciatic nerve injury. There is approximately 10% incidence of sciatic nerve injury from posterior hip dislocation. Partial recovery of the sciatic nerve occurs in 60%-70% of patients. The patient usually requires an anti-foot drop splint to prevent equinus of the ankle. In posterior dislocation of the hip, always look for injuries of the knee such as with a dashboard injury. The force of the injury is usually transmitted from the knee to the hip. There may be an associated posterior cruciate ligament (PCL) injury or a meniscal tear. Examine the knee for injuries and an MRI of the knee may be needed. In cases of high energy trauma, always look at the chest. There might be a tear of the aorta. Check for widening of the mediastinum on chest



x-rays. There is concern of deceleration injury involving the aorta when the patient has a hip dislocation. Hip joint dislocation may be associated with acetabular fracture or fracture of the femoral head (Pipkin fracture). Anterior hip dislocation will have a higher rate of femoral head impaction than the posterior hip dislocations. Do emergency closed reduction of the hip within 6 hours. Early closed reduction of the hip within 6 hours. Early closed reduction is done to avoid avascular necrosis (AVN) of the hip. After reduction of the hip joint, do mobilization of the patient with protected weight-bearing crutches for approximately 4 weeks. After completion of the closed reduction, and the patient has an associated fracture of the acetabulum, assess the hip stability, especially if the fragment is not too large. Usually between 20%-40% fragment size, the hip stability is undetermined, and we don't know if that patient will need surgery or not. The hip is usually stable if the fragment size of the acetabulum is less than 20% (acetabular lip fracture). More than 40%, the fracture fragment needs to be fixed because the hip is definitely unstable if not fixed. When the size of the fragment is not big and not small, the best method to assess the stability of the hip is by examination of the patient under general anesthesia utilizing fluoroscopy. Assess the posterior wall stability with the obturator oblique view. Hip will be in flexion, adduction, and add axial load. Check the medial clear space for opening (opening of the medial clear space suggests instability of the posterior wall fracture). when you have a dislocated hip, the first thing that you want to do for the treatment of the patient is to reduce the dislocated hip.



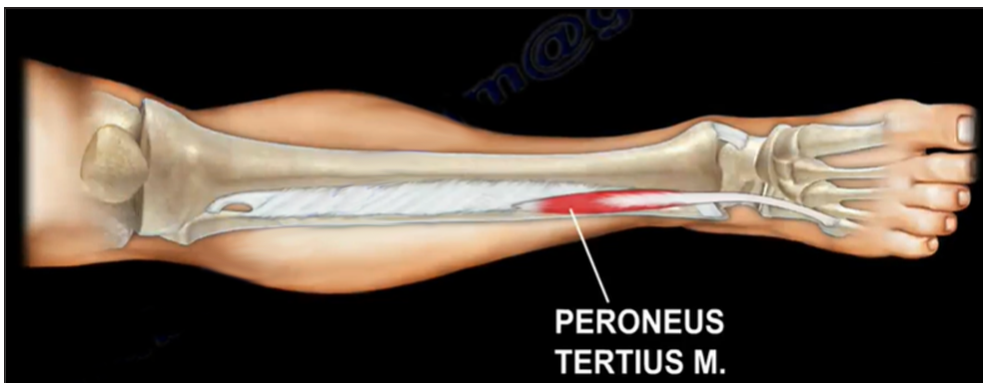
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## Peroneus Tertius Muscle

The peroneus tertius muscle is absent in about 10% of the population. The peroneus tertius muscle arises from the distal third of the extensor surface of the fibula. The peroneus tertius muscle is inserted into the base of the 5th metatarsal bone. The peroneus tertius muscle is located within the anterior compartment of the leg and is innervated by the deep peroneal nerve. The function of the peroneus tertius muscle is eversion and dorsiflexion of the ankle. The peroneus tertius muscle is used as a landmark when establishing the anterolateral portal of ankle arthroscopy. The anterolateral portal is established just lateral to the peroneus tertius muscle and the superficial peroneal nerve, and medial to the lateral malleolus. One should attempt to look for and trace the superficial peroneal nerve before incision for the anterolateral portal.



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