



THE UNIVERSITY OF TOLEDO
MEDICAL CENTER

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THE UNIVERSITY OF TOLEDO MEDICAL CENTER **ORTHOPAEDIC MONTHLY**

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A Patient's Optimism and Persistence

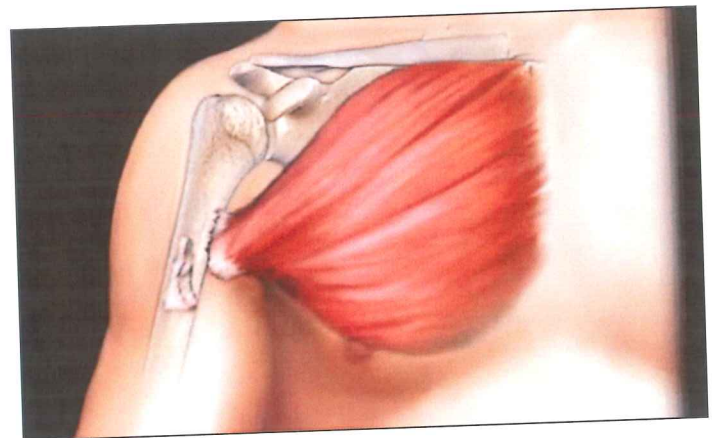
“In 1989, I was a typical high school senior, playing basketball and looking forward to graduation. This all changed in an instant when I was driving to basketball practice when I hit a patch of ice and collided into a bridge abutment. Upon impact, I broke my nose and my lower back leaving me paralyzed from the waist down unsure of my future. I spent the next month at UTMC having surgery to treat my broken back and treatment for pancreatitis. The time I spent in the hospital is what inspired me to be nurse. I graduated as a registered nurse, and I have been working in dialysis and renal nursing since, almost 26 years! Because of Dr. Ebraheim, I have been able to enjoy the things I love to do, nursing and hunting. Dr. Ebraheim saved my life, and in a way, he is the reason I became a nurse. I made something great out of my life when, in reality, it could have ended on that icy day in January of 1989.”

-Carol Niese, Patient of Dr. Ebraheim



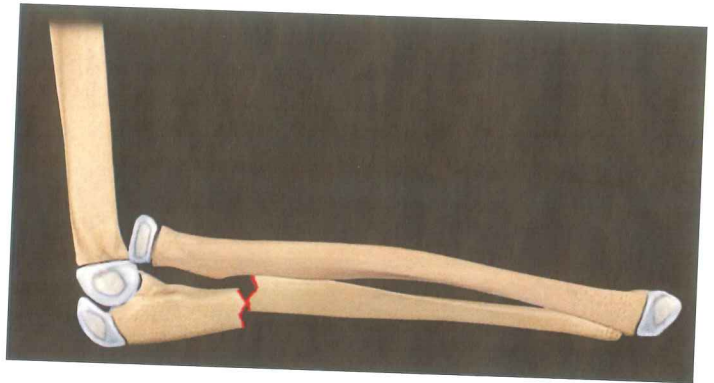
Pectoralis Major Tear

Pectoralis major tear usually occurs in young, male weight lifters during bench pressing from eccentric contraction or lengthening of the muscle. Usually there is pain around the shoulder area, and the patient will feel a “pop” in the shoulder area while performing the bench press. There will be discoloration and burning over the pectoralis into the axilla. There will be swelling, ecchymosis and a palpable defect. The patient will have loss of contour of the axillary fold. MRI will confirm the diagnosis, will localize the site of the tear, and will also differentiate between partial and complete tear. Tendon avulsion is the most common type of injury to the pectoralis major muscle, and the tear is usually a complete tear. Hemorrhage and edema at the level of the proximal humeral shaft indicates a pectoralis major tendon rupture. To treat, reinsert the involved tendon into the humeral shaft, lateral to the biceps tuberosity. Chronic tears will need tendon graft, which is a more complicated surgery. The tendon is usually retracted, and the outcome is not as good as in case of acute repair.



Monteggia Fracture

Monteggia fracture is not a simple fracture. It is a fracture of the proximal ulna with dislocation of the radial head. Monteggia fracture can happen in children and in adults. It is one of the most common injuries that is missed in the emergency room in children. The radial head may be dislocated or subluxed, and this problem may not be clear on x-rays. If this injury is missed, then the child will probably need a big surgery to deal with this big problem. Treatment of this fracture depends on the age of the patient. In general, in pediatric patients, you will do closed reduction of the ulna and closed reduction of the radial head. In adult patients, you will do open reduction with internal fixation of the ulna with dorsal plate and closed reduction of the radial head. A line drawn from the proximal radius should bisect the capitellum in all x-ray views. If you are in doubt and not sure, get x-rays of the other side and compare. Always examine the patient for posterior interosseous nerve injury. The most common type is anterior Monteggia. That means that the apex of the fracture is anteriorly and the radial head goes anteriorly. Just make it a practice, when you have a fracture of the proximal ulna, look at the radius and the radial head, and see the position of the radial head in relationship to the capitellum. Anterior Monteggia is more common in children. Posterior Monteggia constitutes 70-80% of Monteggia fractures in adults. There are four types of Monteggia: Type I, Type II, Type III, and Type IV. Monteggia fracture is classified according to the direction of displacement of the radial head. The radial head has two relations: relation with the capitellum and relation with the proximal radioulnar joint. When the radial head subluxes or dislocates, it subluxes or dislocates from these two joints. The radial head becomes free. This means that the radius is not connected to the capitellum or to the superior radioulnar joint. A Type I fracture is of the middle or the proximal third of the ulna with anterior dislocation of the radial head, and it has the characteristic that the apex of the ulnar fracture is anteriorly. Type I fracture is the most common of all types (especially in children). Type I occurs in about 60% of fractures. In children, reduce the fractured ulna and reduce the dislocation of the radial head and immobilize the elbow in flexion and supination. When you flex the elbow, especially more than 90 degrees, you will relax the biceps (watch the circulation). A Type II fracture is a posterior type fracture. Posterior Monteggia is the most common type in adults. It is associated with a higher complication rate and carries the worst prognosis. 15% of Monteggia fractures are Type II. It is a fracture of the middle or proximal third of the ulna with posterior dislocation of the radial head. You should immobilize the elbow in extension. Type III is a lateral Monteggia. About 20% of Monteggia fractures are Type III. It is a fracture of the proximal ulna with lateral dislocation of the radial head. 5% of Monteggia fractures are Type IV; it is very rare. It is a fracture of the proximal ulna with anterior dislocation of the radial head and fracture of the proximal third of the radius below the bicipital tuberosity. The patient will need surgery, even in children. In this case, the radial head is dislocated, and you also have fractures of the radius and the ulna. The posterior interosseous nerve is adjacent to the radial neck, placing it at risk for a traction injury with dislocation of the proximal radius. You should do a neurovascular examination. A nerve injury which involves the posterior



interosseous nerve is not uncommon. Ask the patient to “hitchhike” and extend their fingers. Make sure the wrist is in dorsiflexion when you ask the patient to extend the fingers. In posterior interosseous nerve injury, the finger extensors will not be working. If the posterior interosseous nerve is injured, observe the patient. In case of posterior interosseous nerve injury in Monteggia fracture, you will reduce and stabilize the fracture and reduce the radial head dislocation. Observe the nerve; do not explore the nerve. Typically the nerve injury is a neuropraxia. It can be expected to resolve itself with observation in 6-12 weeks. If it does not resolve, you will do EMG and nerve studies after that period of observation. Any time that you have an ulnar shaft fracture or any fracture of the proximal ulna, check the radial head position. Make sure that the radial head is reduced to the capitellum (be aware that the subluxation may be subtle). Recognition of Monteggia fracture in children is important. Early appropriate treatment is much easier than treating a missed radial head dislocation. To treat a Monteggia fracture in adult patients, do open reduction internal fixation (ORIF) of the ulna. When the ulna is properly aligned and fixed, the radial head will reduce by itself. After fixation of the ulnar fracture, if the radial head is still not reduced, then assess the ulnar reduction. Check for malalignment or malreduction of the ulna. It is imperative that you restore the length and the proper alignment of the ulna, so that the radial head can be reduced. If we malalign the ulna, then the radial head will remain subluxed. Radial head instability may be caused by nonanatomic reduction of the ulna or by interposition of the annular ligament. Fracture of the ulna may be too comminuted, and it may not be reduced properly. The fracture may also need bone graft later on for healing. A Monteggia variant associated with radial head fracture, in addition to dislocation of the radial head and fracture of the ulna can be a problem. The radial head fracture is usually fixed or replaced, a prosthesis is used to replace the radial head in the elderly, especially if the fracture is comminuted. The subluxation of the radial head is reduced, and the fractured ulna is fixed as usual. Treatment is different in pediatric patients. The radial head ossifies around four years of age. In Type I, Type II, and in Type III Monteggia fractures, you will do closed reduction of the ulna to restore the length of the ulna, and you will do closed reduction of the radial head. Closed reduction is much more successful in young children. In anterior Monteggia, you will immobilize the elbow in flexion and supination. In posterior Monteggia, you will immobilize the elbow in extension.

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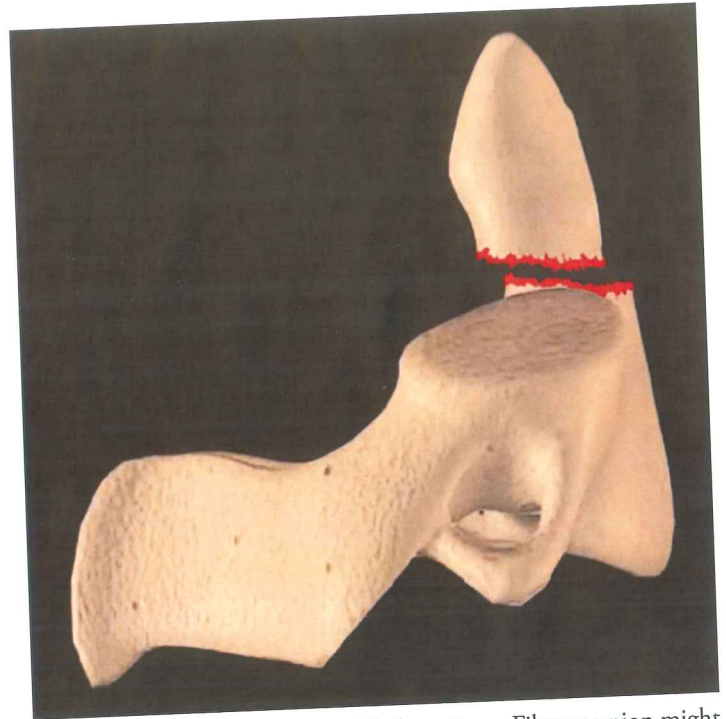
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Type IV fractures require surgery. Surgery is also done in cases where we are unable to restore the proper length of the ulna, we are unable to reduce the ulna, and we are unable to reduce the radial head. In this situation, we can use IM rod or a plate. Dislocation of the radial head with fracture of both the radius and ulnar shaft. Do closed reduction of the radial head with intramedullary pin fixation of the radius and the ulnar shaft fractures. The radius and ulnar shaft fractures are stabilized surgically to give a lever arm for reduction of

the radial head. In this type of fracture, the radial head subluxation may be missed or unappreciated, because the focus is usually on the forearm fractures. To treat a missed or neglected Monteggia fracture in children, do osteotomy of the ulna and lengthening with correction of the angulation, and reduction of the radial head in addition to plating of the ulna. The patient may need open reduction of the radial head.

Odontoid Fractures

There are three types of odontoid fractures. Type I fractures are a stable avulsion fracture of the alar ligament near the tip of the odontoid. A soft collar can be used to treat Type I fractures. Be aware of significant ligamentous injuries. Type II fractures are at the base of the odontoid process. Type II are the most common and are troublesome. The nonunion rate is about 20-80% due to interruption of the blood supply. The risk factors of nonunion include if the patient is over the age of 60 years old, if the patient has more than 6mm of displacement, smoking and diabetes, and you are unable to achieve reduction. In posterior displacement, extension injury (rare type) the anterior displacement is more common (flexion injury). Delay in treatment also increases the rate of nonunion. For treatment of young patients with no nonunion risks use a halo. The patient is younger than 60 years. The fracture is minimally displaced. Initial dens displacement is less than 6 mm, and the reduction is within one week of the injury. Healing will occur in the majority of cases. If the patient has a nonunion risk, or when reduction of the fracture cannot be achieved or maintained, then we need to think about surgery and the fracture pattern. When the fracture pattern allows, you can put an anterior screw into the odontoid (to preserve the motion of C1/C2). Odontoid screw is used in younger patients instead of fusion to avoid loss of 50% of the neck rotation). Do not use the anterior screw fixation in patients with osteoporosis, in older patients, or in patients with a short neck. Another scenario is, if the patient has nonunion risks but the fracture pattern does not allow you to place an anterior odontoid screw, then you are going to fuse C1 to C2 (this will lose 50% of neck rotation). In general, C1/C2 fusion is used in cases of nonunion or it is used in cases of displaced fracture in the older patient and it can also be used if there is a failure of treatment with a halo. C1/C2 fusion can also be used if the fracture is comminuted and unstable. Posterior C1/C2 fusion can be done with different screw or wire constructs. A vascular watershed area exists between the apex of the odontoid, which is supplied by branches of the internal carotid artery and the base of the odontoid, which is supplied by branches of the vertebral artery. Type II fracture of the odontoid may get nonunion due to cortical bone and poor blood supply. Type III fractures extend through the body of C2. This area is rich in blood supply and the fracture heals in the majority of cases. Treatment for Type III odontoid fractures includes external cervical orthosis, especially in the elderly patient. Treatment for Type III odontoid fractures also includes the use of a halo if the fracture is displaced, but do not use a halo in elderly patients. Odontoid fractures in the elderly can occur due to a simple fall and usually the diagnosis is missed. It is associated with increased complications and



mortality. Do not use a halo in elderly patients. Fibrous union might be adequate if the fracture is not badly displaced, otherwise you will do fusion of C1/C2. In general, if the elderly patient with an odontoid fracture is not a good surgical candidate, then you will give the patient a cervical orthosis. You can do the C1/C2 fusion by using transarticular screws, which you are not going to do if you have an aberrant vertebral artery. Another technique can fusion between C1/C2 with the screw placed into the C1 lateral mass and the C2 pedicle, plus a bone graft. There is increased survival for the elderly patient that undergoes surgery for Type II odontoid fracture. This may be a selection bias, because they have healthier patients who are physiologically active and young who are fit for surgery. The synchondrosis between the odontoid and the C2 body fuses by the age of 6 years. Odontoid fracture in young children usually occurs by the age of 4 years. Physicians may confuse the synchondrosis with a fracture. The treatment of odontoid fracture in children is done with a Minerva brace or halo vest, if the fracture is displaced. You will use more pins and less torque. The Os Odontoideum looks like a fracture. It is oval shaped, it has sclerotic edges, and Os is smaller than the normal dens. The Os Odontoideum is a congenital process. The mechanism that causes the Os Odontoideum is unknown, but it is probably developmental or it can result from an old trauma.



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Paronychia

Paronychia is an infection of the nail fold that can be acute or chronic. It is a common hand infection, usually affecting a single digit. The nail fold will be tender, red, and swollen. It will sometimes be fluctuant with pus. It can happen from injury or trauma in the paronychia fold, such as a hangnail, nail biting, manicuring, or due to thumb sucking. Staphylococcus aureus is the most common organism. If the condition occurs early, do warm soaks. You can give the patient antibiotics such as clindamycin or Augmentin. For abscesses, you will do surgery. Do incision and debridement (I&D) with partial or total nail removal, plus antibiotics. Chronic paronychia is a fungal infection of the nail fold. Candida albicans is the most common one. Infection occurs more in diabetics. Multiple fingers can be involved. It does not respond to antibiotics. The infection is rare, but can be recurrent. There is no pus. The nail fold is swollen, inflamed, red, tender, and there is no abscess. Chronic paronychia occurs in people who work with a water environment and chemical irritants such as dish washers, bartenders, gardeners, house keepers, or in dealing with laundry. Risk factors include diabetics, patients who take steroids, and patients who take retroviral drugs such as Indinavir, which causes paronychia in HIV positive patients (the condition resolves when they stop taking the medication). To treat chronic paronychia, avoid water, use topical antifungal agents such as miconazole and topical steroids, and surgery at a last resort. Marsupialization is done in severe resistant cases.

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