**Traumatic Glenohumeral Dislocation**

Introduction

Traumatic glenohumeral dislocations are a common orthopedic injury that can occur in patients across the lifespan. The glenohumeral joint is very susceptible to dislocation, and it is often referred to as the most mobile, least stable joint in the body. This injury can cause pain and decreased functional use of the upper extremity leaving patients with the inability to complete many activities of daily living. Glenohumeral dislocation can be a serious injury that requires thorough evaluation and rehabilitation to allow the patient to return to functional activities of daily living. Incidence of first time glenohumeral dislocation can range from 12.3 to 26.2 per 100,000 persons per year in the general population[1](http://f1000.com/work/citation?ids=6418918&pre=&suf=&sa=0), however approximately 20% of dislocations occur in patients over the age of 60. [2](http://f1000.com/work/citation?ids=5824836&pre=&suf=&sa=0) The purpose of this paper is to examine glenohumeral dislocation including mechanism of injury, incidence, and treatment methods. Although shoulder dislocations can occur with all age groups, this paper will primary focus on traumatic anterior dislocations in the elderly population.

Subluxation/Dislocation

An expansive review of glenohumeral instability is beyond the scope of this paper however a brief delineation is made between subluxation and dislocation as well as etiology. Glenohumeral subluxation occurs when the head of the humerus has partially translated away from glenoid, and sometimes subluxed shoulders can relocate back into place.3 A dislocation occurs when the head of the humerus translates completely away from the glenoid. [3](http://f1000.com/work/citation?ids=6418484&pre=&suf=&sa=0) Immediate medical attention is required to relocate the humeral head and assess for associated injury.1 Shoulder dislocations can occur in the posterior, inferior, and anterior direction, but 90% of cases will occur in the anterior direction. [1,4](http://f1000.com/work/citation?ids=5824888,6418918&pre=&pre=&suf=&suf=&sa=0,0) Dislocation of the humeral head from the glenoid of the scapula may result from atraumatic or traumatic causes. In atraumatic cases some form of comorbid, congenital, or acquired hypermobility is present while traumatic cases typically result from a clear, biomechanical mechanism of injury.

Mechanism of Injury

In traumatic cases involving younger patients, shoulder dislocations typically occur from a sports related or high energy injury, whereas older adults may sustain the injury from lower energy injuries such as a fall onto an outstretched hand.4 In the older population, shoulder dislocation can occur more frequently due to age related tissues changes in elasticity, such as damaged or weak rotator cuff musculature. [5](http://f1000.com/work/citation?ids=5824841&pre=&suf=&sa=0)

Traumatic glenohumeral dislocation may also cause other injuries involving the upper extremity. In the elderly population, the most common injury associated with glenohumeral dislocation is a rotator cuff tear.1,2,5,[6](http://f1000.com/work/citation?ids=5824823&pre=&suf=&sa=0) Simante et al reported that 54% of 87 older adults who had incurred a shoulder dislocation also had rotator cuff injury. [7](http://f1000.com/work/citation?ids=3195884&pre=&suf=&sa=0) Another injury that can occur with a glenohumeral dislocation is a humeral fracture. Humeral fracture may include a compression fracture of the humeral head (Hill Sachs Lesion), anterior glenoid rim fracture, and greater tuberosity fractures. 2,6 Older adults are at a greater risk for humeral fracture due to greater rates of osteoporosis and decreased articular cartilage within the joint.2 After the first traumatic shoulder dislocation, greater risk for obtaining recurrent dislocations exists. This is most common in the younger population with recurrence ranging from 50-90% in patients younger than 40 years old.1 Chalidis et al reported recurrence up to 92% in patients under the age of 20 compared to only 14% recurrence in patients over the age of 40.4 When dislocation occurs in the younger population, the patient is more likely to sustain a Bankart lesion due to the high velocity impact, which causes an increase in instability of the shoulder joint.2 The elderly population is less likely to sustain a Bankart lesion, and more likely to sustain a rotator cuff injury, which does not make them as susceptible to recurrent shoulder dislocations.2 The risk factors for recurrent shoulder dislocation and glenohumeral instability are younger age, male gender, and hyper laxity.8 Changes in activity level with aging may also play a role in the higher recurrence at a younger age. [8](http://f1000.com/work/citation?ids=5824826&pre=&suf=&sa=0) Along with soft tissue and bony injuries associated with dislocation, risk for nerve and vascular injury also exists. Older adults are at an increased risk for nerve injury due to age related degenerative changes in the neural tissue.5 The most common nerve injury is with the axillary nerve followed by suprascapular nerve, musculocutaneous nerve, radial nerve, and ulnar nerve.5 A risk also exists for brachial plexus injury associated with glenohumeral dislocations. Although brachial plexus injury is rare, it can cause severe complications within the upper extremity, and has been found to be more common in adults older than 60 years old. [9](http://f1000.com/work/citation?ids=6419189&pre=&suf=&sa=0) Because of the risk of other injuries associated with anterior glenohumeral dislocation, it is important that the patient receive a thorough evaluation with diagnostic imaging to rule out any injury.

Intervention

Traumatic anterior glenohumeral dislocation will typically present with anterior fullness caused by the displaced humeral head, and the patient holding the affected shoulder in a slightly abducted and externally rotated position while cradling their forearm.10 Patients regardless of age should report to the emergency room for X-Ray and other imaging to confirm the diagnosis and determine if there are any other associated injuries.2,5 At the emergency room, a physician or other healthcare professional will need to reduce the dislocation to ensure realignment of the humeral head back into the glenoid.10 Relocation of the humeral head typically involves traction of the humerus or a manipulation of the scapula.2 Wen et al. found that reduction of humerus has a 70-90% success rate regardless of the type of reduction method used. [10](http://f1000.com/work/citation?ids=5824865&pre=&suf=&sa=0) Although most reduction methods are successful, older adults have a greater risk for neurovascular injuries with anterior dislocation, so it is important to monitor distal pulses continually, and examine the humeral plexus before and after reduction.5 Older adults also have a higher risk for iatrogenic fracture due to the excessive traction that occurs during relocation.5 Shin et al. reported that 5.4% of patients over 40 presented with iatrogenic humeral fracture after reduction.5 Although risk factors for reductions are unlikely, it is important to reassess the patient with X-ray or other imaging to ensure the reduction was successful, and to assure no other injuries occurred.10 After reduction, patients will typically be required to immobilize the arm.5 Some debate about the appropriate length of time for immobilization exists with some authors reporting 7-10 days to prevent joint stiffness, while others report immobilization for 3 to 6 weeks to ensure proper healing has occurred.5,6,10 The shoulder should be immobilized in a position of external rotation following reduction. [11](http://f1000.com/work/citation?ids=6803291&pre=&suf=&sa=0) Itoi et al. determined that immobilization in internal rotation had a 42% chance of dislocation recurrence, compared to only a 26% chance of recurrence with the shoulder immobilized in external rotation.11 After reduction and initial management of the dislocation, the treatment options for patients either involves surgical management or conservative treatment.

Surgical management is most commonly indicated whenever the dislocation involves other associated injuries such as fracture, rotator cuff tear, or labral lesion.2,4,10 Surgery may also be recommended for patients who have had unsuccessful conservative management of the dislocation.10 In some instances, patients with recurrent shoulder dislocations and glenohumeral instability may benefit from surgery to help lower the risk of recurrence.5 In cases with irreparable rotator cuff tendon, surgeons can use a pectoralis major tendon transfer to replace the rotator cuff, and restore stability to the glenohumeral joint.[12](http://f1000.com/work/citation?ids=6419791&pre=&suf=&sa=0) Maier et al. found that surgical intervention to reduce recurrence of glenohumeral dislocation has been successful in populations older and younger than 40.[13](http://f1000.com/work/citation?ids=6419803&pre=&suf=&sa=0) Four common types of surgical management techniques exist to treat anterior glenohumeral instability.10 The four techniques include procedures that limit external rotation by tightening the anterior structures such as the Putti-Platt technique, bony blocks to prevent anterior humeral head translation such as the Bristow procedure, osteotomies to either the glenoid or humerus to change rotational alignment, and anatomic reconstruction of the disrupted anteroinferior capsulolabral complex.10 Although surgical management can be successful in reducing the risk for recurrent dislocations, functional outcomes and postoperative function following surgical intervention is poorer in the elderly population compared to the younger population.5,13 Following surgical management, patients will then begin a rehabilitation protocol to allow for functional recovery of the involved upper extremity.5

Post Reduction/Management

Patients who undergo successful relocation of the glenohumeral dislocation and do not have any other associated injuries, conservative treatment is a successful treatment option.4,5,6,10 Shin et al. reported that 79% of patients with anterior shoulder dislocations and no rotator cuff tears presented with either good or excellent clinical outcomes after conservative management at a 2 or more year follow-up.5 In a study that examined 67 older adults with anterior shoulder dislocations, 46% patients did not have associated injuries and all had satisfactory clinical outcomes without recurrent dislocation with conservative treatment.[14](http://f1000.com/work/citation?ids=5824837&pre=&suf=&sa=0) Sonnabend et al. examined patients over 40 with shoulder dislocation, and found that in the 27 patients who stated they felt “comfortable and strong” after 3 weeks of physical therapy, only 4 developed complications during the next 3 months.[15](http://f1000.com/work/citation?ids=6420433&pre=&suf=&sa=0) Physical therapy treatment should begin within the first week after reduction and should involve range of motion exercises to prevent post traumatic shoulder stiffness.2 The physical therapist will start with passive range of motion and slowly add progressive active range of motion within the next 3-4 weeks.4 After full range of motion is achieved, the patient will begin strengthening and shoulder stabilization exercises, which can will primarily focus on the rotator cuff, scapular, and shoulder muscles. [16](http://f1000.com/work/citation?ids=6420472&pre=&suf=&sa=0) The literature supports more sport related and higher level functional activities for younger and athletic populations with shoulder dislocations.15 For older adults with shoulder dislocations, the literature typically discusses more conservative and basic rehabilitative exercises rather than working on sport specific or higher level functional activities.2,5,10 For example, Shin et al. states that patients should be educated that “treatment will be aimed at decreasing pain and allow recovery of ROM rather than obtaining premorbid levels of function.”5 Murthi et al suggests early ROM exercises and progressive rotator cuff strengthening, but does not mention anything about sport specific or functional activity.2 Although rehabilitation has shown to be successful in the older adult population, very little research exists about exercises for sport related or higher level activity for elderly patients who want to continue playing sports and stay active. Typically conservative treatment will last from 6-12 weeks depending on the patient’s progress and functional improvement.5,6,10

Conclusion

Traumatic glenohumeral dislocations are a very common orthopedic injury that can occur in all ages across the general population. Older adults sustain about 20% of shoulder dislocations, and most of them will only require conservative treatment to improve symptoms. For patients with other injuries associated with the dislocation such as rotator cuff tear, nerve injury, fracture, or other soft tissue injury, the patient will most likely require surgical management to fix the issue. Depending on the severity of the injury and patient’s progress, rehabilitation can last anywhere from about 6 weeks to several months, and may take longer if surgery is required. Individuals who receive prompt management and early initiation into an evidence based rehabilitation program have the best opportunity for a favorable outcome and return to their prior level of function. Although conservative rehabilitation has shown to be successful in the older adult population, there is very little research about exercises for sport related or higher level activity with this age group. More research should be completed to determine safe and appropriate exercises for elderly patients with glenohumeral dislocation who want to continue doing sports or overhead recreational activities.

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