Shoulder dislocations

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Abstract

Of all major joint dislocations, 50% occur in the shoulder, with anterior dislocation being the most prevalent. Because the glenoid is shallow and only articulates with a limited portion of the humeral head, the shoulder joint is unstable. Although most dislocations happen anteriorly, the shoulder can dislocate fully or partially, forward, backward, or downward. A dislocation may become more complicated if the fibrous tissue connecting the bones is strained or damaged. To move the bones out of alignment, a powerful hit to the shoulder, for example, is necessary. A shoulder that is rotated too much may pop out of its socket. Anterior, posterior, inferior, partial, or total dislocation are all possible. We will quickly go over each type of dislocation and how to address it in this fast review.

Introduction

The shoulder is naturally unstable since it is a large joint with a wide range of motion. The fibrocartilaginous labrum and the several rotator cuff muscles work together to stabilize the joint because the glenoid fossa is shallow. Dislocations are frequent because of the inadequate support provided by the shoulder joint (1).

Fifty percent of major joint dislocations are shoulder dislocations, with anterior dislocation being the most prevalent type. Because of its shallow glenoid, which articulates with only a small portion of the humeral head, the shoulder is an unstable joint (2).

Figure 1. Normal shoulder position

The most frequently displaced joint in the body is the shoulder joint. Although most dislocations happen anteriorly, the shoulder can dislocate fully or partially, forward, backward, or downward. A dislocation may become more complicated if the fibrous tissue connecting the bones is strained or damaged. To move the bones

out of alignment, a powerful hit to the shoulder, for example, is necessary. The shoulder may pop out of its socket due to extreme rotation (3).

Shoulder dislocations are a common result of contact sports injuries. Shoulder dislocations in young patients typically happen when they play contact and overhead sports like baseball, football, and rugby. In elderly individuals, falls at home are the most common cause of shoulder dislocations. Uncertainty surrounds the cause of the peak occurrence in elderly women. Dislocation is frequently caused by trauma from falls and auto accidents (4).

Men account for about 70% of shoulder dislocations. Men aged 16–20 had the highest frequency (80.5 per 100,000 person years) and women aged 61–70 had the highest incidence (28.6 per 100,000 person years) in a cohort analysis of 16 763 individuals who had their first anterior dislocation in the UK. Similar peak instances can be found in other Western nations like the US, Canada, and Norway (5).

Types of shoulder dislocations

Anterior shoulder dislocation

In general, there is a bimodal age distribution for anterior shoulder dislocation. Young adult men with high-energy shoulder injuries make up the first and by far largest group. Elderly patients who have suffered injuries with far less violence make up the second category. The dislocation in elderly individuals typically turns out to be a singular incident. In order to prevent the danger of long-term stiffness, early mobilization and reduction are also top management targets for this second, older age group (6).

Glenohumeral dislocations are anterior in more than 95% of cases. When the humerus is violently rotated out of the glenoid socket during abduction, anterior

bone and soft tissue structures are avulsed (the Bankart lesion). The anterior glenoid rim is frequently struck by the last, posterior portion of the humeral head as it leaves the joint, resulting in the Hill Sachs lesion, a bony indentation at the rear of the humeral head (7).

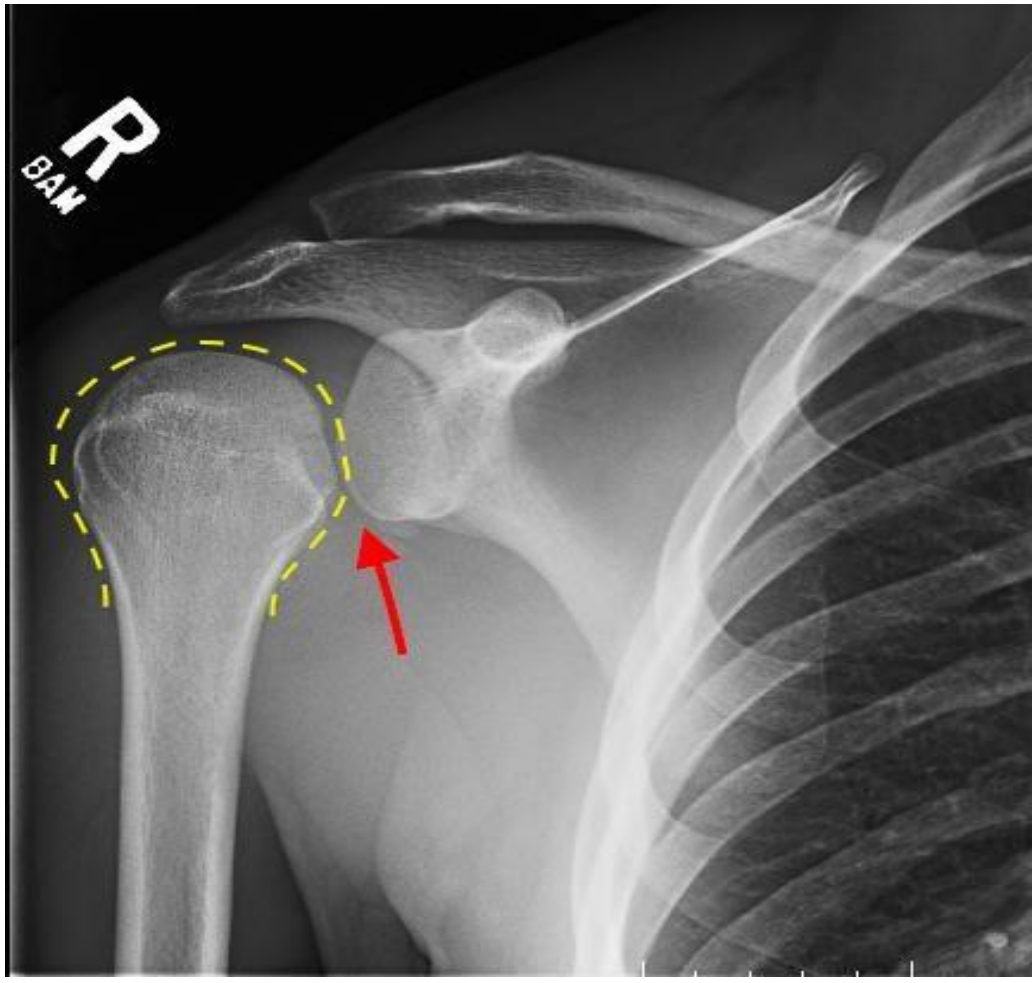

Figure 2. anterior shoulder dislocation

An anterior shoulder dislocation can be easily identified by a trauma specialist. Typically, the arm is held with its rotation to the outside. The acromion is pronounced laterally and posteriorly, and the deltoid has lost its typical shape. It is possible to feel the humeral head itself when looking forward. A more thorough examination can reveal particular damage to the area's vascular, neurological, and bone

components. Recording neurovascular state is crucial before attempting lowering. Long-term damage to the rotator cuff could also occur. We'll examine each of these flaws one at a time (8).

Posterior shoulder dislocations

Shoulder posterior dislocation is an uncommon condition that can be clearly identified by radiography and clinical assessment. Despite making up less than 2% of all shoulder dislocations, it is significant for diagnostic and therapeutic purposes because the majority are overlooked during the initial examination. Twenty-one of the twenty-four patients in the series had not at first been diagnosed with posterior dislocation (9).

Figure 3. posterior shoulder dislocation

Dislocation and posterior subluxation are sometimes confused. An acute condition linked to trauma and a humeral head impression defect is posterior dislocation. The length of the dislocation and the extent of the defect will dictate how it is treated. Although the term "dislocation" has been used, this actually refers to subluxation since some of the humeral head's articular surface is in touch with the glenoid and some is behind it. Recurrent posterior subluxation is a unique condition that is frequently unrelated to trauma and necessitates entirely different care, such as non-operative therapy or posterior shoulder reconstruction (10).

Fractures of the tuberosities or the surgical neck of the humerus may be linked to posterior dislocation. Neer (11) defined fracture-dislocations as two-, three-, or four-part posterior fracture-dislocations. They need a distinct strategy and course of care, including shoulder arthroplasty or osteosynthesis.

An impression fracture of the articular surface of the humeral head is a feature of chronic posterior dislocation of the shoulder, which is a missing acute posterior dislocation that has gone unnoticed for longer than three weeks (12).

Inferior shoulder dislocations

Luxatio erecta humeri, another name for traumatic inferior shoulder dislocation (ISD), is thought to account for 0.5% of all shoulder dislocations. There aren't many case series, despite the fact that many case reports have been written about the injury. Mallon et al. (13) evaluated 80 examples from the English and non-English literature and detailed six more cases in one of the largest assessments of the literature, which was published in 1990. Subsequently, advancements have been made in shoulder injury investigation methodologies, surgical management alternatives, and rehabilitation procedures.

ISD is mostly caused by two different modes of damage. The first method involves driving the humeral head through the weaker inferior glenohumeral ligaments by means of an axial compression through a completely abducted arm. In the second mechanism, an arm that has previously been abducted is hyperabducted, which causes the proximal humerus to be levered over the acromion and injures the rotator cuff and inferior and middle glenohumeral ligaments (14).

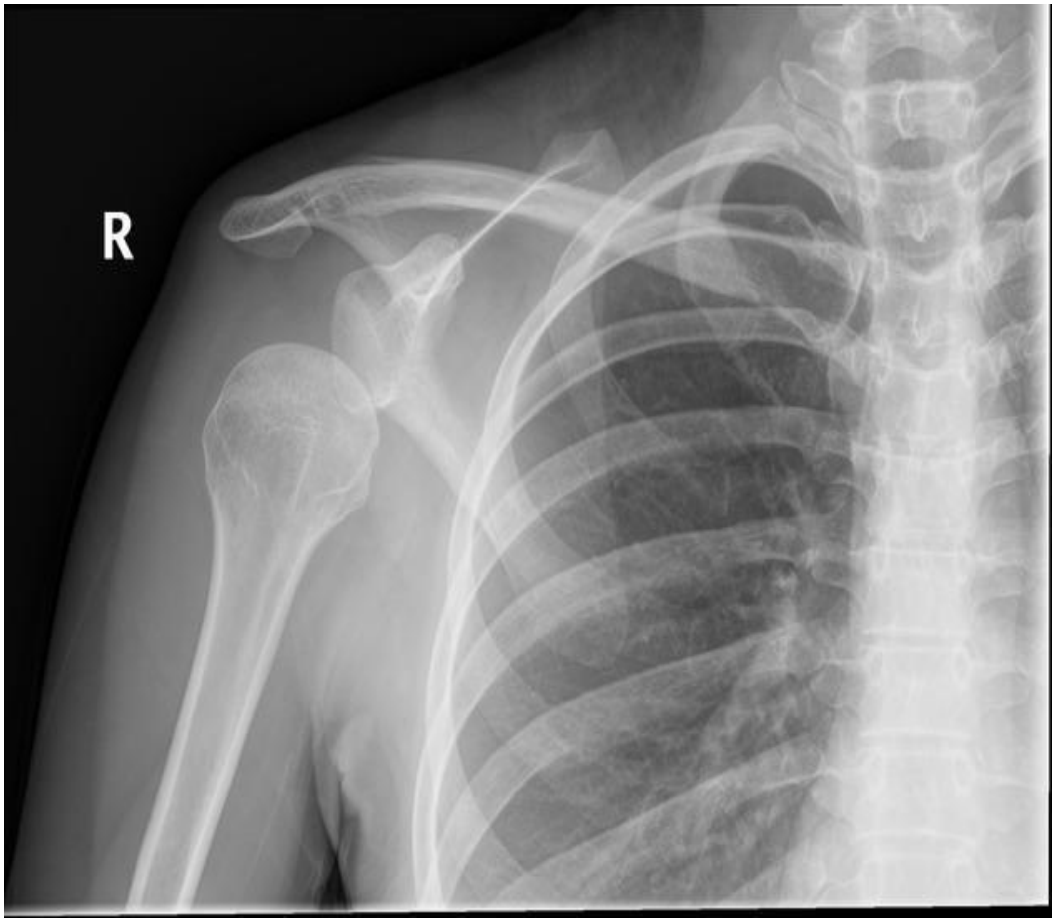

Figure 4. inferior shoulder dislocation

Individuals diagnosed with ISD exhibit a unique clinical and radiological appearance. The humeral head is frequently palpable in the axilla, and the arm is in a permanent abducted position with the humerus locked inferior to the glenoid. On

clinical examination upon presentation, the average reported abduction of the humerus was 125° (70°–170°). The traditional way to show a patient is to have their elbow bent, forearm pronated, and hand either behind their head or on their forehead. The latissimus dorsi and teres major pull the humeral head inferiorly, while the pectoralis major maintains the humerus in the upright posture. The triceps long head prevents the humeral head from moving posteriorly (15).

Clinical evaluation

Obtaining an AP radiography picture of the shoulder—also referred to as the Grashey view—is the first step in diagnosing a suspected shoulder dislocation. Additionally sufficient is a trans-scapular view, also referred to as the scapular "Y" view. The glenohumeral ligaments and labrum can be well assessed by diagnostic procedures like CT or MRI arthrography, however these are typically not performed in an urgent situation. Some would advise getting a CT scan for patients who come to the ED, particularly if a posterior dislocation is suspected (16).

Patients who have experienced shoulder trauma typically exhibit significant discomfort and limited range of motion. Bending forward, the wounded arm is supported in place by the other arm, which is slightly abducted. The most frequent injury recorded in a first-time anterior dislocation is a fall onto the outstretched arm or a direct impact to the shoulder, although any trauma to the shoulder can result in dislocation (17).

The way in which trauma manifests and its symptoms offer crucial diagnostic hints. Examining the damaged side in an anterior dislocation reveals an asymmetric shoulder contour and a large acromion because the humeral head has moved front and lower (anteroinferior) (18).

Anteriorly, the humeral head cannot be felt in a posterior dislocation. The manner of damage and the impalpable humeral head may serve as diagnostic indicators for a posterior dislocation. Request an anteroposterior and scapular "Y" radiograph for patients who have a suspected dislocation in order to identify the dislocation's orientation, confirm the diagnosis, and highlight any potential fractures. The scapula is shaped like a Y, and the Y radiograph employs a sagittal view to visualize this. It is capable of telling an anterior dislocation apart from a posterior or inferior one. Radiographs have a high sensitivity (94%) and specificity (95%) for detecting fractures with higher tuberosity (19).

Complications of shoulder dislocations

Shoulder dislocation can be accompanied by rotator cuff tears, larger tuberosity fractures, and neurological impairments. Rarely does vascular damage occur. In a prospective trauma database research involving 3633 patients, 14% of traumatic anterior dislocations were associated with a neurological deficit, 16% with a larger tuberosity fracture, and 10% with a rotator cuff tear. Patients over 40 had the highest frequency of larger tuberosity fractures and rotator cuff lesions, which increased with age. Fractures that are related to first-time dislocation and high-energy trauma (such as a fall from a height) are more common. It might be challenging to diagnose rotator cuff injuries clinically. A rotator cuff tear may cause chronic pain and the difficulty to regain function after treatment (20).

Examine whether any neurovascular structures are damaged. Verify the capillary refill and radial pulse. Asking the patient to spread their fingers (ulnar nerve), extend their fingers (radial nerve), and oppose their thumb (median nerve) can be a rapid way to determine whether they have damage to their motor neurons. Shoulder pain, numbness on the lateral side of the upper arm, and deltoid muscle

weakness (abduction) are signs of axillary nerve damage. After reduction, loss of sensation frequently disappears (21).

Age, related fractures, and hemorrhage all raise the chance of nerve damage. Within a year, the majority of patients recover on their own and restore feeling and muscular strength; however, their injured shoulder's range of motion may be slightly restricted. Retrospective multicenter study (15 739 patients) found that less than 1% of patients had brachial plexus and peripheral nerve damage that persisted after a year (22).

Management of shoulder dislocations

There are many different reduction techniques. Whatever the maneuver, there are a few universal rules that hold true. In order to prevent muscle spasm and neurovascular impairment, acute dislocations should be reduced as soon as possible. This will ensure a careful and technically sound closed reduction. The amount of time since the dislocation and the strength of the shoulder girdle muscles both influence how easy the reduction will be. Reduction without the need for local anesthetic is possible if the injury is attended to quickly. However, reduction may be more challenging and anesthetic may be necessary if the patient is unable to relax or if the muscle is in spasm (23).

The first reduction method for anterior shoulder dislocation was documented by Hippocrates. To release the humeral head, the doctor places a foot in the patient's axilla and applies traction to the injured arm using alternate internal and exterior rotation. Due to the significant risk of brachial plexus traction injuries, this mostly historical approach has been discontinued (23).

The Spaso technique was first reported in 1998, and it involves placing the patient in a supine position. The doctor places himself next to the afflicted arm and

holds it in a 90-degree forward flexion. The arm is subjected to mild external rotation after mild vertical traction. To stabilize the glenoid, the scapula's medial border needs to remain in touch with the bed. After a few minutes of traction, reduction should happen on its own, or the humeral head can be actively moved in the direction of the glenoid fossa. There have been reports of success rates between 68% and 88% (24).

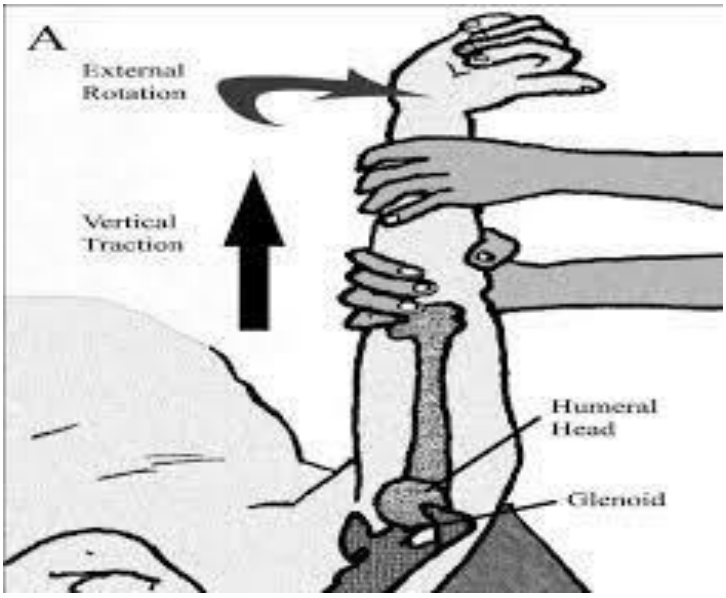

Figure 5. SPASO technique

Sayegh et al. (25) provided a description of the Fast, Reliable, and Safe (FARES) technique for anterior shoulder dislocation reduction. With this approach, the doctor stands on the side that is injured while the patient is in a supine position. With the elbow extended and the forearm rotating in a neutral manner, the patient maintains an adducted arm position. There is no countertraction while applying axial traction. During the reduction maneuver, there is a quick, short-range oscillating vertical movement. The arm is gradually taken away. The arm continues to abduct and oscillate vertically while being progressively turned externally at 90 degrees of abduction. Usually, reduction happens about 120 degrees of abduction.

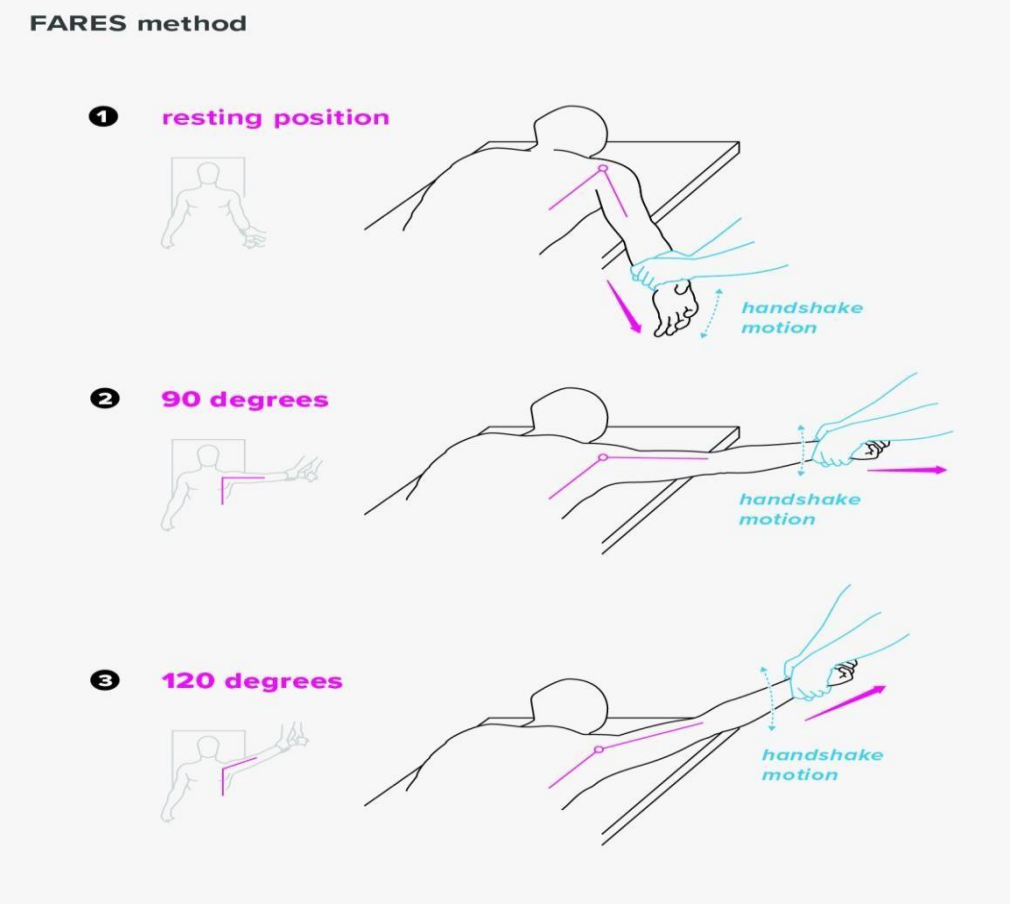

Figure 6. FARES method

Posterior dislocations are often difficult to diagnose. However, when the arm is held fixed, internally rotated, and adducted, posterior shoulder prominence can be seen. Movements that are both passive and active are also limited. Closed reduction is frequently challenging and may call for anesthesia. It should only be tried in patients with humeral head abnormalities that account for 20% or less of the articular surface and within three weeks of the injury. The reduction maneuver requires two operators. In order to separate the humeral head from the glenoid rim, the doctor forward flexes the shoulder to a 90-degree angle before adducting and internally rotating the arm. While the doctor gently applies anteriorly directed pressure on the

posterior humeral head, the assistant maintains cross-body traction. To finish and verify reduction, external rotation can finally be tried (26).

An inferior dislocation can be changed to an anterior dislocation using the two-step procedure. Once converted, any anterior dislocation reduction technique can be applied. Using one hand to push laterally on the abducted humeral shaft and the other to pull superiorly on the medial epicondyle, the examiner stands at the patient's head. This action will rotate the humeral head anteriorly around the glenoid rim and remove it from the infraglenoid position. The arm could be brought up against the chest wall if the conversion is effective. After that, any anterior dislocation reduction approach, including external rotation or traction countertraction, may be used (27).

Post-reduction care

The aim of rehabilitation is to restore maximum range of motion (ROM) while maintaining stability after a successful reduction. For a minimum of three to four weeks, the afflicted arm is immobilized, and restricted physical therapy is advised. Start the program with passive range of motion exercises. For the first four to six weeks following injury, patients with anterior shoulder dislocations are restricted from external rotation past neutral and abduction past 90 degrees. On the other hand, internal rotation is restricted for four to six weeks in individuals who have posterior dislocations. To strengthen the stabilizing musculature, isometric contractions for muscle rehabilitation can be started right away after the injury. After the patient regains full strength and range of motion pain-free, they can resume their athletic activity (28).