Chapter 1

Clinical Examination of the Shoulder
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History taking, fallacies of tests and comprehensive examination of shoulder.

The gleno-humeral joint is the most commonly dislocated joint in the body. Shoulder as a whole, broadly comprises of the gleno-humeral, scapulo-thoracic, acromion-clavicular and the sterno-clavicular joint. A synchronous coordinated movement of all these four joints brings about efficient abduction and forward flexion. Shoulder problems are usually sharply demarcated by age as compared to other joints in the body. Thus in a young patient the diagnosis is highly likely to be shoulder instability, whereas in an elderly sixty year lady, the diagnosis is probably a rotator cuff problem – tear or degeneration.(ref to graph).
History Minutiae

The working diagnosis should be arrived at the end of history taking. The age, hand dominance and occupation details are also contributory to the final diagnosis. Teachers, carpenters, painters are prone to rotator cuff problems. Software professionals and executives suffer from postural problems leading to scapular dyskinesia and fatigue of the postural muscles presenting as neck pain and medial scapular tender spots. Over head athletes are more likely to suffer from labral injuries, internal impingement and in later life – rotator cuff problems. Pain in shoulder conditions is rarely experienced at the shoulder joint itself. Invariably it is sensed as fatigue pain over the deltoid area presenting as a palm sign. AC joint arthritis patients will localise their pain at the AC joint with a finger – aka the Finger sign. Neck pain and medial scapular pain are often indicative of a weak rotator cuff or scapular dyskinesia. Pain as a result of a shoulder condition rarely travels beyond the elbow joint. Actions such as pouring from a jug of water, mimic the Hawkins sign and are clearly indicative of impingement. Night pain is unbearable and does not respond to NSAIDs. During the daytime gravity gives a helping hand distracting the head of the humerus from the acromion avoiding impingement. Overhead tasks will naturally eliminate the advantage of gravity. With the reduced acromion-humeral distance, as a result of cuff inflammation or dysfunction, supine position aggravates the pain. Rotator cuff tear patients notice aggravation of pain on overhead activity and can complain of crepitus or grinding. These symptoms can also be experienced in the presence of a thick sub-acromial bursa or gleno-humeral arthritis. Passive ROM of shoulder is more profound in patients with partial cuff tear than in complete cuff tear. Rest pain could suggest a tumour or infection. Morning stiffness of less than ten minutes is probably arthralgia seen amongst ligament laxity individuals, whereas if more than an hour
in duration is indicative of an inflammatory arthropathy such as Rheumatoid arthritis. A shoulder with inflamed rotator cuff or bursitis does not tolerate any jarring motion or a sudden jerk which leads to intense pain. Patients complaining of a feeling of insecurity and inability to throw are hinting at shoulder instability or subluxation episodes that can be difficult to establish. It is important to establish whether the instability is traumatic or atraumatic. If the index dislocation occurred due to significant trauma during sports or a fall, it is likely that one is treating traumatic unidirectional instability. Trivial injury leading to dislocation of the shoulder which is often reduced by the patients is more suggestive of multidirectional atraumatic instability. A previous history of shoulder dislocation can be very relevant in patients presenting with shoulder pain in their late ages. They could have either a rotator cuff degeneration or secondary arthritis. “Voluntary” nature of dislocations needs to be established as these are not easy to treat and certainly such patients are not good candidates for a surgical repair. The incidence of neurodeficit is very common during dislocation episodes and must be looked for. The axillary nerve is most commonly injured due to its short winding course and more often than not it is a neuropraxia that recovers in time. Reduced sensations in the regimental badge area are not a consistent feature of axillary nerve injury. Occasionally shoulder instability patients experience stinging or burning pain along the dermatomes of the upper limb. These are called as STINGERS or BURNERS and are indicative of shoulder instability. Often football or rugby players experience these as numbness during play and they recover within minutes.
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**Examination proper**

**LOOK**

Ideally, the patient must be from stripped from the waist above. It is preferable to start the examination from behind to observe the extent of rotator cuff wasting which cannot be appreciated from the front. The presence of a mirror in front of the patient can reveal the patient's expressions to the examiner who is watching from behind. In addition the static position of the scapula in comparison to the opposite side can be assessed. On dynamic forward flexion and abduction, the scapulo-thoracic rhythm should be observed for the extent of winging, smoothness of the rhythm and the contribution of the scapulo-thoracic joint to abduction. Often in most shoulder conditions, the rhythm does become dyskinetic without frank winging. Often there is an element of fatigue and the movement becomes dyskinetic after the patient abducts the shoulder a few times. This is a typical feature in patients with MDI where they have a poor sense of proprioception and the postural muscles of the scapula tend to fatigue. Conventionally it was believed that the scapulo-thoracic with the Gleno humeral joint move in a 1:2 ratio. That is not quite true. The ratio varies with individuals and apart from the norm (65%) there are individuals with a predominant Gleno-humeral contribution (20%) and lesser so are individuals with a predominant Scapulo-thoracic rhythm (15%). Kyphosis and scoliosis in turn affect the positioning of the glenoid, which is 30° anteverted normally. Excessive anteversion can lead to instability patterns. Any reduction in the gleno-humeral movement will be compensated by the scapulo-thoracic joint and hence most painful restrictive disorders will lead to some amount of scapular dyskinesia. This changes the length tension relationship of the scapulo-thoracic muscles – Trapezius & the Rhomboids. Excessive strain on these will manifest as fibromyalgia & like disorders, with medial scapular pain and neck
pain. Too often patients with shoulder problems present with their cervical spine X-rays or neck pain preceding their shoulder stiffness.

Observe the AC joint contour, which is disturbed in AC joint injuries & in AC joint arthritis. In neglected posterior dislocations, the upper limb tends to be held “locked” in internal rotation. In addition there will be a subtle bulge on the posterior aspect of the shoulder, which can be easily missed. Dislocated shoulders are usually held in a still position to avoid even the slightest movement. The lateral acromion border becomes prominent in anterior dislocation with a void laterally and a prominent head can be felt anteriorly under the coracoid process. Hamilton’s ruler test is described to compare the dislocated side to the normal side. The circumference of the axilla also increases with a dislocated or subluxated shoulder. An acute bursitis of the subacromial space secondary to rheumatoid arthritis can be dramatic in presentation as shown in the figure. A biceps tendon rupture at its proximal end will present with a Popeye sign with a huge bulge in the midarm though the biceps strength against resistance can remain unaffected. Haemangioma at the shoulder joint is extremely rare as in a six-year old boy occupying the suprascapular area and extending down the arm. A biopsy scar is also visible over the upper arm.

FEEL

**Tenderness** - Invariably the long head of biceps is inflammed & tender in shoulder impingement -i.e. most shoulder conditions. However, LHB synovitis is
usually secondary to another pathology, such as SLAP tear, cuff tear partial / complete. The point of tenderness is usually specific - in AC joint arthritis, exactly over the AC joint. As the Gleno-humeral joint is deeply situated, there is seldom a specific tender point. Often in Arthritis of the gleno-humeral joint, the posterior joint line can be tender.

A detailed palpation of the structural anatomy from the lateral and of clavicle to the anterior acromion and the LHB to posterior joint line and the medial border of scapula should be palpated for tenderness, deformity and swelling.

Very commonly, the supero-medial angle of the scapula and its underlying tissues are tender & chronically painful. The term "fibromyalgia" is loosely used for such a presentation. The most common explanation for such tender spots over the trapezius and the rhomboids lies elsewhere. Weak supraspinatus due to a diverse aetiology will compel excessive recruitment of the trapezius and rhomboid muscles as a compensation manoeuvre to achieve abduction. These being postural muscles, fatigue easily, and in turn lead to sore points.

**MOVE**

It is preferable to assess the active ranges prior to checking the passive range of movement. Instability patients invariably have a full range of motion except for extreme abduction external rotation manoeuvres. SLAP tear patients often have an impressive range unless they present with secondary impingement. AC joint arthritis patients have only terminal restriction of abduction and internal rotation. Rotator cuff tear patients have a poor active range but their passive ranges are deceptively free range of motion. Extra-articular affections, such as Long thoracic nerve and suprascapular nerve compression have a free range of passive movement and an absent Hawkins sign. Impingement patients have a painful arc...
which can be overcome by abducting with the forearm in supination – so called **S**c**a**ption manœuvre. The ranges are documented as degree of movement, except for internal rotation which is best assessed by taking the arm behind the back. Ranges vary from nil – lateral thigh, buttock, SI joint, L5, L1 and T7. The level of the tip of the thumb demarcates the extent of range.

**TESTS**

**Hawkins sign**

The principle of the Hawkins sign is based on understanding the pathoanatomy of impingement. To achieve pain free abduction the normal shoulder effortlessly externally rotates in order to clear the acromion. In the presence of a weak supraspinatus or an inflamed rotator cuff, abduction is compromised due to deficient cavity compression action of the cuff. All signs for impingement use this principle by provoking impingement by forcing internal rotation on the abducted arm. Flex the arm by 90 degrees at the shoulder and elbow and forcefully internally rotate it to provoke impingement. In most conditions where the acromio-humeral space is compromised, patient will experience pain. Beware in patients with an inflammed cuff or diabetic stiff shoulders – a sudden jerk is poorly tolerated and occasionally patients can experience sharp pain.

**Neer's sign**

This is a similar test to Hawkins test with the elbow in extension and the shoulder is forward flexed in internal rotation, based on the same principle.

**Neer's test**

This is distinct from the sign, where the patient is injected with a local anaesthetic in the shoulder joint and the Neer's sign performed 10 minutes after the injection. If the pain is relieved or reduced considerably reduced, it is diagnostic of
impingement. The test is seldom used in the practical sense, as it is too lengthy to be performed in a busy clinic and it is perhaps best to avoid an invasive procedure on a pious joint.

Shoulder examination can be conducted in a modular fashion, instead of following a dogmatic protocol. Thus, in a young 22-year patient, the instability tests are given preference over tests for AC joint arthritis. Similarly, in a 70-year patient, priority is given to tests for AC joint and rotator cuff tests over instability tests.

**Tests for instability**

Shoulder instability commonly manifests as recurrent dislocation. However, there is a wide spectrum from inability to throw to frank recurrent dislocation. Superior labral tear patients have predominantly a problem in throwing and have significant internal impingement. Anterior labral tears can present initially with recurrent subluxations, which may later progress, to a full-blown Bankart tear with recurrent dislocation. Hence the change in terminology – Recurrent “Instability” rather than “Dislocation”. Minor subluxations can by themselves cause a Hill Sachs lesion. To that extent, the very first dislocation episode itself can cause a large Hill Sachs’s lesion. As we see it now, a Hill Sach’s lesion is a measure of the violence that caused the instability rather than the degree of recurrent instability. The diagnosis of instability is based on history, physical examination and occasionally imaging.

**Anterior Instability**

**Drawers test**

This can be done either with the patient standing or with the patient lying down. I prefer to let the patient lie down so that they are relaxed allowing the examiner to test the drift of the head of the humerus without any accompanying apprehension or spasm. Hold the glenoid anterior & posterior margins with one hand & negotiate the head of the humerus anteriorly & posteriorly to assess the anterior & posterior overriding over the glenoid. The extent...
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of overriding can be classified as grade I, II & III depending on 1cm, 2cm or 3 cm drift. A grade I drawers test is within normal limits and commonly seen in individuals with ligament laxity. The direction and extent of laxity has to be defined by the examiner – ex. Grade III Posterior Drawers. It is vital to gain confidence of the patient and ensure their compliance. Obviously, this test is best done under GA. It is mandatory to perform an examination under anaesthesia before starting any surgery for shoulder instability to understand the direction and extent of shoulder instability. Drawers test when done in 90 degrees of abduction, will test the middle and inferior Gleno-humeral ligaments integrity.

Crank test for anterior instability

With the patient supine the arm is gently taken into abduction and external rotation, which is usually the provocation manoeuvre in anterior instability. The examiner is required to watch the patient’s facial expressions, as this is an “apprehension” test. The patient usually winces in apprehension of a subluxation and will point to the anterior aspect of the shoulder as the area of discomfort. At this point, it is best to proceed to the Jobes’ relocation test.

Jobes’ Relocation test

In continuation with the Crank test, the examiner uses his opposite palm anterior to the humeral head and relocates the head back into the glenoid. The apprehensive patient usually feels significant relief immediately although the arm is still held in the same abduction & external rotation position. Without forewarning the patient, the examiner can then release the hand over the head of the humerus maintaining the arm in abduction & external rotation. As a result of the sudden release, the patient experiences varying degree of pain and apprehension. The patient with a grossly unstable shoulder will almost sit up in a reflex move.
FALLACIES

1. Patients with internal impingement of the rotator cuff, commonly patients with laxity, will experience apprehension during the Crank test but the pain and discomfort will be felt over the posterior aspect of the shoulder. Patients with SLAP tears may also experience similar discomfort over the posterior shoulder joint line.

2. The test may be false negative in anxious patients, patients with severe spasm and muscular individuals.

Sulcus Test

The inherent laxity within the shoulder joint can allow the examiner to distract the joint by linear traction on the hand and observing a “sulcus” under the lateral margin of the acromion. Usually this is less than one cm. Occasionally individuals with generalized ligament laxity will demonstrate a significant sulcus more than one cm often allowing the examiner to insinuate a finger between the acromion and the head of humerus laterally. A sulcus less than one cm is considered normal and graded 1+. A sulcus 1cm to 2 cm is ++ and a sulcus more than 2cms is +++.

Ligament laxity

Beighton, a rheumatologist, described cases of arthralgia of non-inflammatory origin seen in individuals with ligament laxity. Typically due to the non-inflammatory origin these patients fail to respond to conventional NSAIDs. He devised a crude score for assessing general ligament laxity. Hyper flexion at the
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thumb MP joint, hyper extension at MP joints, recurvatum at the elbow and knee were credited one point each, which was doubled for the opposite side giving a score of eight. Hyper flexion at the spine allowing the individual to easily touch the floor with their palms will give a total score of 9. A score between 5 to 9 is representative of generalized ligament laxity. However occasionally individuals may have isolated shoulder laxity without any other joints involved. Ligament laxity is common amongst Indian females and Orientals - where both the sexes seem to be equally involved. This physiologic laxity is distinct from other collagen disorders with hyper elasticity.

Rotator Interval
The sulcus test done with linear traction in about 30 degrees of forward flexion will demonstrate the extent of rotator interval tear. The treatment of rotator interval and its repair is a controversial subject. Largely interval tears are suffered by throwing athletes and this should be treated aggressively in such high performance athletes.

CLINICAL APPLICATION

Some shoulder surgeons prefer to repair the interval or certainly tighten it with a PDS suture as a rule in all Bankart repairs. I think it should be treated according to merit. Only in cases where there is excessive laxity and the capsule labral repair is not enough, to tighten the anterior structures should one resort to interval repairs. Without doubt, patients with cuff tears with dissociation between supraspinatus and Subscapularis should undergo an interval repair. In retracted chronic rotator cuff tears, the surgeon could electively create an interval tear to help mobilize the supraspinatus to its original footprint and then repair the interval at its new position.
**Posterior Instability**

It is a more infrequent injury and for that very reason it is often missed. There are major differences in comparison to recurrent anterior instability. One, the mode of injury is usually an adduction internal rotation mechanism. Also epileptics or individuals suffering an electric shock are more likely to injure their posterior labrum. Unlike anterior instability, formal dislocation is unusual. Patients manifest with posterior shoulder pain and typically pain on extremes of adduction & internal rotation. Predominantly throwing athletes develop posterior instability. Super Frisbee is rugby like aggressive sport where the rugby ball is replaced by a Frisbee. Volleyball players also are known to have superior labral and posterior labral tears, some of which can remain asymptomatic. Awareness of the condition and detailed clinical examination will help avoid missing the condition.

Perform the **posterior apprehension test** in adduction and internal attempting to push the humeral head beyond the posterior rim of the glenoid. The patient experiences discomfort and should point to the posterior joint line as the area of discomfort. The test should be positive in conjunction with an increased posterior drawer and sulcus test. A **Jerk or Jahnke test** is described to provoke the head of the humerus to subluxate & relocate into the glenoid. The Jahnke’s test has an excellent PPV for recurrent posterior instability & an associated posterior labral tear or Bennet lesion.

**SLAP (Superior labrum anterior to posterior) tears**

The superior labrum bears the insertion of the long head of the biceps to a varying degree, sharing the insertion with the superior glenoid tubercle. Recent biomechanical studies suggest that the SLAP lesion can occur during either the
maximal cocking or the early deceleration phase of throwing. Diagnosis of a symptomatic SLAP lesion remains a challenge. Throwing injuries in overhead athletes usually lead to a SLAP tear. In the non-athletic population diverse mechanisms of injury can lead to a SALP tear. Typically a sudden jerk while a) leading a large dog on a leash or b) lifting excessively heavy weights on the bench press can lead to SLAP tears. Occasionally while travelling in a bus and holding the overhead bar rail when the bus comes to a sudden unexpected stop can cause a similar injury. Individuals with ligament laxity maybe prone to such injuries. There is evidence to suggest that individuals with an internal rotation deficit (IRD) of more than 25 degrees due to a tight internal capsule are likely to have a SLAP injury. IRD is the ratio of external rotation with internal rotation measured in 90 degrees of abduction at shoulder & 90 degrees of flexion at the elbow. W.B. Kibler found that all sixty-four patients with a postero-superior labral tear had restricted gleno-humeral internal rotation, measured as a side-to-side difference of at least 25°, and that 88% had postero-superior joint-line pain with abduction and external rotation. A positive O'Brien test was noted in less than 50% of the patients. SLAP tears are difficult to diagnose for lack of a good diagnostic test. Patients with SLAP tears often have an impressive range of movement but have a weak throwing arm. The stiffness that ensues is secondary to the supraspinatus tendon impingement. Usually this occurs as “internal impingement”. Internal impingement has been defined as contact between the postero-superior aspect of the rotator cuff and the postero-superior aspect of the glenoid labrum with the shoulder in the cocked throwing position of 90 of abduction and maximum external rotation. The resulting contact between the undersurface of the infraspinatus and supraspinatus and the postero-superior aspect of the glenoid labrum results in rotator cuff and labral abrasion, tearing, and degeneration. This typically occurs in abduction external rotation simulating a throwing action and was first demonstrated by S Snyder. In contrast conventional impingement typically occurs in internal rotation above ninety degrees flexion with the cuff being pinched between the acromion & greater tuberosity.
O'Brien test

This test was first described in AJSM 1998 & is more sensitive than specific. With the arm in 90 degrees of forward flexion and adduction at the shoulder, ask the patient to flex his arm against resistance. If the arm drops down with pain at the shoulder joint it is considered a positive O'Brien test. However other conditions like Full thickness rotator cuff tear, Bankart tear and florid AC joint arthritis can also present as false positive. In addition patients with multidirectional instability and scapular dyskinesia will also have a positive O'Brien albeit without the accompanying pain. To make matters worse, MRI of the shoulder may also fail to reveal a SLAP tear. A combination of history, examination and imaging can collectively help the clinician arrive at a diagnosis of a SLAP tear. The Crank test and Jobes’ relocation test are often (false) positive in the presence of a SLAP tear but the pain and discomfort is felt at the posterior aspect of the shoulder joint at the site of internal impingement. To improve the ability of an MRI to diagnose a SLAP tear, one must advise the radiologist to use the ABER (Abduction External Rotation) protocol so as to separate the torn superior labrum from its parent bed. The use of Gadolinium intra-articular contrast will also enhance the probability of diagnosis. If the contrast is seen to separate the labrum from the glenoid it is diagnostic of a SLAP tear.

The crank test had a specificity of 67%, a sensitivity of 64%, and a positive predictive value of 53%. The O'Brien test had a specificity of 41%, a sensitivity of 67%, and a positive predictive value of 60%. In contrast, magnetic resonance imaging had a specificity of 92%, a sensitivity of 42%, and a positive predictive value of 70%.

Anterior Slide test for SLAP tears

Kibler documents the sensitivity and specificity of a clinical test to aid in the diagnosis of superior glenoid labral lesions. The anterior slide test, a method of
applying an anteriorly and superiorly directed force to the gleno-humeral joint, was performed on several groups of athletes. These included symptomatic athletes with isolated superior labral tears, rotator cuff tears, and instabilities, and asymptomatic athletes with rotational deficits. In addition, non-throwing athletes were tested. The sensitivity of the test was 78.4%, and the specificity was 91.5%. This study shows that the anterior slide test can be used in the clinical examination, in that it has high specificity for superior labral lesions, but not enough sensitivity to be the sole diagnostic criterion for these lesions.

**Rotator Cuff tests**

Painful arc – A compromise of the rotator cuff function – either complete or partial, due to tear or inflammation, leads to an inefficient abduction leading to a painful arc. This is better observed with the arm coming down rather than active abduction.

He patient continues to perform their ADLs in which predominantly includes considerable forward flexion and abduction in day to day tasks, with a weak inefficient abduction, the patient begins to recruit trapezius and rhomboids and compensates by way of excessive Scapulo-Thoracic movement leading to scapular dyskinesia and pseudo winging with medial scapular tender spots and neck pain.

**Supraspinatus**

**Empty can test** - The arm is placed in 30 degrees of flexion and abduction in the plane of the scapula with the elbow fully extended and thumb pointing down (Empty can test) towards the floor. The patient is asked to raise the arm against resistance applied by the examiner over the forearm. If the arm flops down with pain, it is indicative of a rotator cuff tear. This is often referred as **Drop arm sign** and though diagnostic of a full thickness cuff tear, it can be occasionally seen in the presence of severe cuff inflammation or large partial tears. The empty can position eliminates most of the deltoid action but
patients with weak Supraspinatus may recruit the biceps by flexing the elbow. During the test, with experience, one can establish whether pain is associated with weakness or the weakness is secondary to pain. Often the patient has impingement and does not tolerate internal rotation and in itself this is a difficult test for patients to perform. Hence it is advisable to do the Full can test as well.

**Full can test** – The same test is repeated with the thumb pointing up towards the ceiling. The deltoid shares the load of the Supraspinatus and it is performed with ease. In the presence of a full thickness tear both the empty can and the full can tests will be positive. In Supraspinatus tendonitis, calcific tendonitis or partial tears of the rotator cuff the full can test will be negative whereas the empty can test may be positive. The full can test is more specific for the diagnosis of a full thickness tear.

**Infraspinatus**

Resisted external rotation tests the infraspinatus and the Teres minor together. However if the external rotation is tested from the midline the contribution of the Teres minor is minimised. It is impossible to isolate the Teres minor from the infraspinatus. The patient is asked to tuck the elbow near his waist in 90 degrees of flexion at the elbow and rotate the forearm externally against resistance.

**Hornblower Test:** External rotation can also be tested against gravity by flexing the shoulder and elbow to 90 degrees and internal rotation at the shoulder joint (like the Swiss Horn blowers). The patient is then asked to externally rotate against gravity against resistance. Most patients with impingement do not tolerate flexion and internal rotation at the shoulder. It is an excellent test to eliminate compensation by Teres Minor.

**Subscapularis**
Gerber’s lift-off test is performed by bringing the arm passively behind the body into maximum internal rotation. The result of this test is considered normal if the patient maintains maximum internal rotation after the examiner releases the patient's hand. If passive maximum internal rotation cannot be actively maintained and the hand drops straight back and cannot be lifted off the spine without extending the elbow, the result is considered positive. If the resistance is weak and the hand drops back more than 5 degrees but not all the way to the spine, the result is considered weak. The other potential internal rotators of the humerus (Pectoralis Major and Latissimus Dorsi) have a limited role in maintaining internal rotation when the arm is placed behind the back.

Subscapularis is a large and strong muscle. In comparison to supraspinatus & infraspinatus, degenerative tears although known, seldom occur within the Subscapularis. Such extreme internal rotation may not be possible in some patients. As an alternative, the Napoleon test is described. Also in Subscapularis rupture an increase in the external rotation as compared to the normal side is a contributory finding.

In the presence of a rotator cuff tear, it is common to feel crepitus in the subacromial region. In thin patients with wasted deltoid, occasionally one can palpate the defect in the cuff while rotating the arm internally and externally.

**Napoleon or Belly Press test**

With both palms resting on the abdomen, when patients exerted pressure on the abdomen, patients were not able to maintain the elbow anterior to the midline of the trunk, as viewed from the side; instead, the elbow dropped back behind the trunk. The test can be performed with the examiner's hand inserted between the patient's hand and stomach to assess the pressure exerted on the stomach compared with that exerted by the hand on the uninjured side. The eponymous test takes its name from
Napoleon, whose photographs universally show his palm tucked inside his coat on his belly.

**External Rotation Lag sign - ERLS**
When there is an isolated tear of the Infraspinatus then the balance between the external and internal rotators is lost.

Hertel described the ERLS where in on keeping both the shoulders in 90 degrees of abduction and external rotation, the affected arm remains rotated anteriorly due to lack of Infraspinatus strength. The test has 100% positive predictive value (PPV) of 56% & 32% negative predictive value (NPV). Hertel also described a similar Internal rotation lag sign (IRLS) which has a 97% PPV & 69% NPV.

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**Acromio-Clavicular Joint tests**

**Cross adduction test**
The AC joint is stressed by adducting the shoulder at 90 degrees flexion and the patient should perceive pain specifically at the AC joint. This is a sensitive test but its specificity for AC joint arthritis is low.

**Fallacy** – Patients with restricted internal rotation due to a tight posterior capsule, will naturally experience pain on stretching during the cross adduction test. However the pain here would be at the posterior aspect of the shoulder joint and not over the AC joint. Similarly, in suprascapular compression neuropathy, the nerve can be stretched at the cross adduction test leading to pain over the spino-glenoid notch. As stated earlier patients with AC joint arthritis will also have a positive O’Brien test.

**Paxinos sign**
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The examiner performs the test for the Paxinos sign with the patient sitting comfortably on the examining couch and the affected arm by the side of the chest wall. The examiner's hand is placed over the affected shoulder such that the thumb rested under the postero-lateral aspect of the acromion and the index and long fingers of the same or contralateral hand are placed superior to the midpart of the ipsilateral clavicle. The examiner then applies pressure to the acromion with the thumb, in an antero-superior direction, and inferiorly to the midpart of the clavicular shaft with the index and long fingers. The specificity of both the above tests for AC joint OA is low but can be enhanced considerably if a Bone Scan or MRI is combined with the test. Rotator cuff pathology is a common association of AC joint arthritis especially in the presence of an inferior osteophyte.

Long Head of Biceps.

Speed Test

The shoulder is forward flexed in supination with the elbow 30 degrees flexion against resistance applied at the forearm. Pain near the long head of biceps is indicative of tendinitis.

Yergasson's test

Resisted supination of the forearm with pain at the long head of the biceps is taken as a positive test. More often than not, Long head of Biceps tendonitis is secondary to impingement of the shoulder and is seldom indicative of any primary biceps pathology. Due to its intra-articular course it is most susceptible for synovitis or oedema. Very often this is a striking
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feature of all USG studies of the shoulder but lacks significance.

Nerve Tests

Serratus Anterior

Symptoms of Long thoracic nerve palsy will be exclusively evident at the shoulder joint by weakening the scapular anchorage to the ribcage. Serratus weakness can be very debilitating and cause shoulder stiffness. If the nerve is affected at the root level, more proximally, then the weakness is profound and winging is readily apparent. The long thoracic nerve can suffer a compression neuropathy in the mid axillary line just proximal to the innervation of the muscle by its various branches. The aetiology is usually either idiopathic or traumatic. The vascular leash of vessels proximally over the course of the nerve from an adherent scar tethering the nerve causing neuropathy of the branches distal to the nerve. The point at which the nerve is tethered often corresponds to the tender point within the axilla in the mid axillary line. I call this point the “Frostick Point” after Prof. Simon Frostick, Liverpool from whom I picked up the surgical decompression. Since the branches proximal to the nerve are unaffected the weakness of the muscles is incomplete.

Wall push test

Performing the wall push with both the elbows in full extension will reveal the winging of the medial border of the scapula. In addition, a tender point can be elicited at the above described point to reinforce the diagnosis. Confirmation can be achieved with
EMG studies by needling the Serratus anterior muscle, provided the duration of affection is more than 6 weeks.

**Trapezius**

Accessory nerve compression can also cause winging of the scapula. The test for winging is carried out in the same manner as above. The pattern of winging in trapezius weakness differs from conventional Serratus anterior weakness. Here the supero-medial aspect of the scapula is drawn out posteriorly. The accessory nerve is not entrapped conventionally. Invariably it is either injured during extensive neck surgery – radical Commando operation or it is incarcerated within scar tissue at the site of surgery. The few cases that I have come across have been singularly as a result of surgical lymph node excision.

In addition to atypical winging, patients have weakness in elevating the scapula and as a result of this develop impingement at the shoulder with stiffness.

**Compression neuropathy of Suprascapular nerve**

Compression neuropathy of the suprascapular nerve is a rare and infrequently diagnosed condition. The suprascapular nerve can be compressed at two different levels. A lesion in the spino-glenoid notch will invariably affect only the Infraspinatus muscle. If it is compressed at the suprascapular notch then both the supraspinatus and infraspinatus are affected and then the presentation is not too different from a rotator cuff tear. It is rather unusual for a patient to have isolated
Infraspinatus weakness, as commonly it is the Supraspinatus which undergoes a degenerative tear. Young individuals with Infraspinatus wasting should arouse suspicion of a compression neuropathy. Patients with Compression neuropathy of Suprascapular nerve have symptoms similar to a cuff tear. However Hawkins sign is negative and the passive ranges are free. Usually there is a ganglion compressing on the nerve. Occasionally patients have a sharp configuration of the suprascapular notch or a tight spino-glenoid notch. Volleyball players are known to have superior labral tears with an associated ganglion in the suprascapular notch. The wasting of the cuff muscles is disproportionately severe in comparison to the duration of symptoms. The cross adduction test is positive in suprascapular compression neuropathy with pain over the spino-glenoid notch.
REFERENCES


