Chapter

1

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Clinical Examination of the Shoulder

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History taking, fallacies of tests and comprehensive examination of shoulder.

History Taking

Shoulder is one of the joints, which can be completely assessed based on history. A systematic scheme to rule out each condition will help the clinician arrive at a reasonable differential. Age of the patient demarcates pathology quite well. In that sense, an old patient is unlikely to have shoulder instability and by the same coin, a young patient is less likely to suffer osteoarthritis. However there are always rare instances of the above occurring, but as an astute clinician one must think of common things first. Shoulder pain may originate in the neck as well and discerning between neck & shoulder, as cause of pain is also essential.

A rotator cuff involvement results in night pain, which is typically aggravated in night on sleeping and often defies analgesics. Pain over the regimental badge area, Medial scapular pain or Codman's point is directly suggestive of a shoulder aetiology. Even lower Trapezius spasm and pain can be a compensatory spasm over a weak rotator cuff. On the contrary, radiating neck pain, extending below elbow and associated with tingling numbness over a dermatome, is likely to be of cervical origin. Association of trauma leading to pain immediate after the injury, is probably a rotator cuff tear or

Greater tuberosity (GT) injury. A fall on the outstretched hand may result in a AC Joint dislocation whereas fall on the tip of the shoulder is likely to cause GT injury or acromion fracture. The clinician should endeavor to ask patient to perform tasks, which mimic the specific signs. Such as to, evaluate impingement on history, ask the patient if they can comfortably pour water of a jug or iron clothes or reach an object in front. Pain on removing clothes or reaching overhead is probably a painful arc syndrome. Arthritis patients will insist they have at least 15 minutes of morning stiffness, classically worse in the monsoon or winter season.

The instability patient will directly affirm the nature of dislocation. Most dislocations are anterior in nature and a result of an Abduction external rotation injury. The nature of Index injury is fundamental. The velocity of trauma, how soon was it reduced back to normal and whether there was any associated neurovascular event. Subsequent number of dislocations, how many of them were reduced by a doctor and whether they were self-reduced is essential in understanding the degree of damage and chances of recurrence. A classic Multi Directional instability (MDI) patient will dislocate frequently, of trivial trauma ad easily self relocate. To diagnose a SLAP tear a history of throwing injury or analogous injury is a must. Often the only complaint of a patient with SLAP tear, maybe inability to throw.

A patient with excruciating pain disproportionate to the signs and worse at night may be suggestive of a tumour or infection. Often this is associated with constitutional symptoms such as fever, weight loss & anorexia.

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 patients expressions to the examiner, who is watching from behind. Also evaluate the static position of the Scapula in comparison to each other. The key feature is indeed assessment of dyskinesia and scapula-thoracic rhythm. Look for the type of winging of scapula, smoothness of rhythm & the percentage contribution of scapula 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.

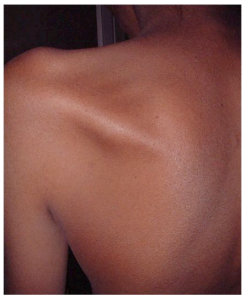

Figure 1: Wasting of supraspinatus & Infraspinatus

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

Figure 2: Bursitis secondary to rheumatoid arthritis.

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.

Figure 3: Haemangioma in 6 year boy of 2 years duration.

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. position.

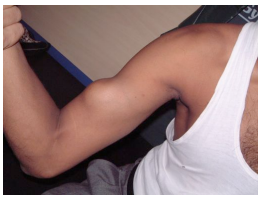

Figure 4: Popeye sign.

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 Glena-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 super 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 varied etiology will compel excessive recruitment of the trapezius and rhomboid muscles as a compensation manouevre to achieve abduction. These being postural muscles, fatigue easily and in turn lead to sore points.

Hawkins Sign

The premise 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 thus 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. Hawkins test is a popular test for diagnosing impingement. According to Macdonald (JSES 2001) Hawkins test is 88.7% sensitive for subacromial impingement and 85% sensitive for diagnosing a rotator cuff tear.

Figure 5 Hawkins Test

Neer's sign

This is a similar test to Hawkins test with the elbow in extension and the shoulder in 90 degrees of flexion and 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 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. In the same vein, 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 thro 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 Sach'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.

Figure 6 Anterior Apprehension test

Anterior Instability

Load & Shift 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 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 anaethesia 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. Alternatively a similar manouvre of abduction external rotation may be performed as the **Anterior Apprehension test** with the patient standing but the clinician must observe the face of the patient for the earliest signs of apprehension, lest he dislocate inadvertently. When the apprehension test is sharply positive in 40 degrees of abduction, it is highly suggestive of an anterior glenoid bone loss and a CT scan work up is advised. This is called the **Mid range instability 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. The **O'brien test** is also reliably positive in anterior shoulder instability. However the O'brien is a rather sensitive and less specific test (Kibler, AJSM 1998). The posterior apprehension test is also similarly done with the arm placed in steep adduction, internal rotation and observing the expressions of the patient. However the sensitivity of this test is poor. On similar grounds, when affected arm is placed into steep adduction, internal rotation, one can elicit a **Posterior apprehension test** by watching the patient's expression. However this test is not sensitive for posterior instability. The jerk or Jahnke's test is best performed with the patient seated. The affected arm is sequentially paced in steep horizontal adduction and internal rotation whilst simultaneously applying a posterior force. This provokes the head to ride over the posterior glenoid rim. While bringing the arm back into neutral position the head of humerus relocates giving an unmistakable clunk confirming a positive jerk test. (From Krishnan, Hawkins & Adams. The Shoulder and the Overhead Athlete).

Figure 7 Posterior Apprehension test.

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. 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 posterosuperior labral tear had restricted glenohumeral internal rotation, measured as a side-to-side difference of at least 25°, and that 88% had posterosuperior 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 posterosuperior aspect of the rotator cuff and the posterosuperior 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 posterosuperior 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 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

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. 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 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.

Figure 8 O'Brien test

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.

Ligament laxity

Figure 9: Ligament laxity at MCP joints

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 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. Hyperflexion 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 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 patients continue 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. The empty can position eliminates most of the deltoid action but patients with weak Supraspinatus may recruit the biceps by flexing the elbow. 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. 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. 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.

Infraspinatus

Figure 11: Infraspinatus test

Figure 10: Infraspinatus test against gravity

Resisted external rotation tests the infraspinatus and the Teres minor together. 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.

External rotation can also be tested against gravity by flexing the shoulder and elbow to 90 degrees and internal rotation at the shoulder joint. 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.

Subscapularis

Figure 12: Gerbers lift off

There are several tests for Subscapularis & none are absolute. 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. 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.

Napoleon or Belly Press test.

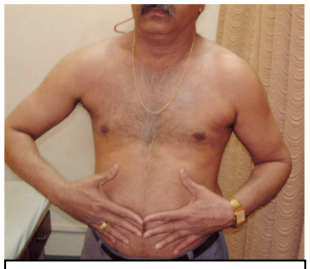

Figure 13: Napoleon test

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 drops back behind the trunk. The eponymous test takes its name from Napoleon, whose photographs universally show his palm tucked inside his coat on his belly.

ASB Subscapularis test

Figure 14 ASB Subscap test for Right shoulder

Our experience with both these tests is not satisfactory. Subscapularis tears are difficult to diagnose clinically, radiologically, even on MRI and often missed on arthroscopy as well. Hence we use the following test labeled ASB Subscap. The arm is placed in 90 degrees abduction on side and with the elbow at 90 degrees flexion; resisted Internal rotation is tested against the clinician's palm. A weakness of grade III MRC or less is considered positive for subscapularis tears. Also a weak subscapularis in abduction suggests a full body tear involving the inferior insertion of subscapularis. A weak subscapularis in neutral position is more suggestive of the common upper subscapularis tear – Grade I or II.

Acromio-Clavicular Joint tests

Cross adduction test


Figure 15: 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

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 tendonitis.

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

Figure 16: Yergassons test for biceps tendon

biceps pathology. Due to its intra-articular course it is most susceptible for synovitis or oedema. Very often this is a striking 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. Since the branches proximal to the nerve are unaffected the weakness of the muscles is incomplete. The point at which the nerve is tethered often corresponds to the tender point within the axilla in the mid axillary line.

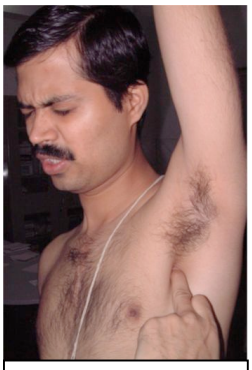

Figure 18: Tender point in mid axillary line

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

Figure 17: Winging in Long thoracic nerve palsy

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. The better test for accessory nerve injury is Triangle sign (Ofer Levy et al 18, #4 573-576,JSES 2009) by asking the patient to remain prone and ask them to elevate both the arms forward. On the affected side the patient is unable to lift the arm forward and lags behind.

Figure 20: Winging in Accesory nerve palsy

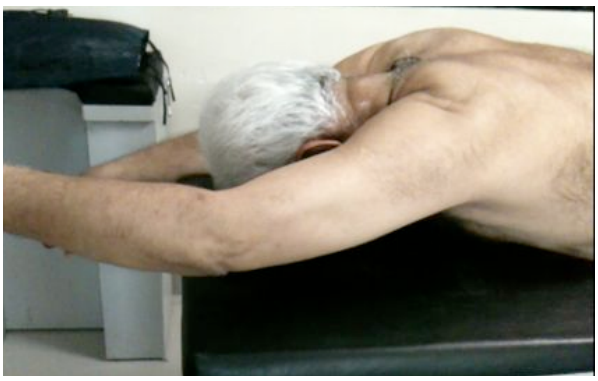

Figure 19 Triangle sign for accesory nerve- depicting normal left arm elevation

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.

Figure 21: Isolated wasting of infraspinatus in Suprascapular Nerve compression at teh spino-glenoid notch

Quadrilateral space syndrome

This condition is seldom seen and is largely a clinical diagnosis. Typical patient has palm sign with sometimes associated with vague tingling numbness over the deltoid as its related to the axillary nerve The axillary nerve is trapped in the Quadrilateral triangle marked by Shaft of humerus laterally & the long head of triceps medially and Teres Minor and Teres Major above and below. Tenderness

on palpation over the Quadrilateral space associated overhead symptoms is typical. Weakness of deltoid & teres Minor s variable but Terse minor atrophy is often seen. We confirm our cases on USG assessment. EMG or NCV studies may be normal in many of such cases. We have seen about six patients of classic Quadrilateral syndrome. Quadrilateral space syndrome with axillary nerve compression, or injury involving all or some of its branches, may be caused by multiple potential factors such as space occupying lesions, repetitive injury, muscle hypertrophy, or trauma.

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