



Non-Surgical Rehabilitation Approach for Multidirectional Shoulder Instability

A Physiotherapeutic Treatment Lookout

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Abstract: A shoulder region is one of the core regions when it comes to do active daily living activities as well as sports specific activities. An injured shoulder can be disastrous factor in accordance of patient's need. When it comes to shoulder joint instability, then there should be a history of the subluxation and that leads to dislocation and recurrent dislocation. It will affect the stabilization and maintenance of the shoulder region at the glenohumeral joint. A recurrence in dislocation may be the biggest reason to worry when an athlete or a player is being injured on and/or off the field. A rehabilitation approach regarding the Multidirectional Shoulder Instability should be sports and musculoskeletal specific where whole shoulder region should be analyzed and treated accordingly.

Keywords: Multidirectional shoulder instability (MDI), Non-Surgical Rehabilitation, Strengthening, Return to activity.

Introduction:

Multidirectional shoulder instability (MDI) is a condition characterized by generalized instability of the shoulder in at least 2 planes of motion (anterior, posterior, or inferior) due to capsular redundancy.[1]

When Multidirectional shoulder instability is described, the term "shoulder instability" constitutes a spectrum of disorders that includes dislocation, subluxation and laxity. Anterior instability is the most common form of glenohumeral instability and may be associated with nerve injury. The diagnosis of anterior, posterior or multidirectional instability is based on a thorough history and physical examination that includes specific provocative manoeuvres. The load-and-shift test, the relocation test, the drawer test, the sulcus test and the anterior apprehension test are useful for assessment of the shoulder. Radiographic studies should include special views to delineate specific lesions, such as a Bankart lesion and a Hill-Sachs defect. Early surgical intervention may be a consideration, especially in younger patients.[2]

Treatment is a trial of prolonged physical therapy focusing on dynamic stabilization and periscapular muscle training. Arthroscopic stabilization with capsular shift is indicated for patients with persistent instability who fail an extensive course of physical therapy.

Non-surgical rehabilitation approach for Multi-Directional Shoulder instability program will vary in length for each individual depending on several factors like, severity of injury, acute and/or chronic condition, ROM and /or Strength status, performance activity demands. This protocol provides general guidelines for initial stage and progression of rehabilitation according to specified time frames, related tissue tolerance and directional preference of movement. The intent is to provide the therapist with a general framework.[3]

Approach should be done and clear as per rehabilitation phases in return to sports/play criteria when it occurs to the patient/athlete. Return to sports criteria should have absence of pain, Full range of motion, little to no apprehension, imaging with magnetic resonance imaging (MRI) may be considered in the patient evaluation, depending upon individual presentation. [3]

Method in phases processed way of non-surgical rehabilitation (A Clinical implementation in a rehabilitation):

Phase 1: Acute Motion Phase

Goals

- Re-establish nonpainful ROM
- Retard muscular atrophy

Decrease pain/inflammation Decrease Pain and Inflammation

- Therapeutic modalities (e.g., ice, electrotherapy)
- Gentle joint mobilization

Range of Motion Exercises

- Pendulums
- Circumduction
- Rope and Pulley
- Flexion
- Abduction to 90 degrees, progress to full ROM

L-Bar

- Flexion
- Abduction
- Internal rotation with arm in scapular plane
- External rotation with arm in scapular plane (progress arm to 90 degrees of abduction as tolerated)
- Posterior capsular stretching
- Upper extremity ergometer Shoulder hyperextension is contraindicated.

Strengthening Exercises

- Isometrics
- Flexion
- Abduction
- Extension
- Internal rotation (multi-angles)
- External rotation (scapular plane)
- Weight shifts (closed-chain exercises)

Criteria for Progression to Phase 2

- Full ROM (Range of Motion)
- Minimal pain of tenderness
- “Good” MMT (Manual Muscle Testing) of internal rotation, external rotation, flexion, and abduction.

Phase 2: Intermediate Phase

Goals

- Regain and improve muscular strength
- Normalize arthrokinematics
- Improve neuromuscular control of shoulder complex

Initiate Isotonic Strengthening

- Flexion
- Abduction to 90 degrees
- Side-lying external rotation to 45 degrees
- Shoulder shrugs
- Extension
- Horizontal Adduction
- Supraspinatus
- Biceps
- Push-ups

Initiate Eccentric (Surgical Tubing Exercises at 0° Abduction)

- Internal rotation
- External rotation Normalize Arthrokinematics of the Shoulder Complex
- Continue joint mobilization
- Patient education of mechanics and activity modifications of activity/sport

Improve Neuromuscular Control of Shoulder Complex

- Initiation of PNF
- Rhythmic stabilization drills Continue Use of Modalities (As Needed)
- Ice, electrotherapy modalities

Criteria for Progression to Phase 3

- Full nonpainful ROM
- No palpable tenderness
- Continued progression of resistive exercises

Phase 3: Advanced Strengthening Phase

Goals

- Improve strength, power and endurance
- Improve neuromuscular control
- Prepare patient/athlete for activity

Capsular Stretches

- Address joint imbalances as necessary

Continue Use of Modalities (As Needed)

Continue Isotonic Strengthening (Progressive Resistance Exercises)

Continue Eccentric Strengthening Emphasize PNF

Initial Isokinetics

- Flexion-extension
- Abduction-adduction
- Internal-external rotation
- Horizontal abduction/adduction

Initiate Plyometric Training

- Surgical tubing
- Wall push-ups
- Medicine ball
- Boxes

Initiate Military Press

Precaution - avoid excessive stress on anterior capsule.

Criteria for Progression to Phase 4

- Full ROM
- No pain or palpable tenderness
- Satisfactory isokinetic test
- Satisfactory clinical examination

Phase 4: Return to Activity Phase

Goals

- Maintain optimal level of strength, power and endurance
- Progressively increase activity level to prepare patient for full functional return to activity/sport.

Continue All Exercises as in Phase 3

Continue Capsular Stretches

Initiate Interval Program

Continue Modalities (As Needed)

Follow-up

- Isokinetic test
- Progress interval program
- Maintenance of exercise program

This protocol provides you with general guidelines for the nonsurgical or in-season rehabilitation of the patient with multidirectional glenohumeral instability.

The frequency of visits may be determined mutually by the patient, therapist, and athletic trainer depending upon patient comfort level, progress, and understanding of the home program.

Specific changes in the program will be made by the physician as appropriate for the individual patient. Patients with persistent instability may be candidates for further evaluation and/or surgical intervention.

Additional Notes:

Rehabilitation program should include posture correction strategies, proprioceptive exercises to improve scapulothoracic and glenohumeral movement patterns by using mirror visual biofeedback for correction. In early stages, scapular retraction exercises can be done in a standing position to improve proprioception.[4]

The lawnmower exercise activates kinetic chains involving the trunk, hip and scapular stabilizers, training scapular control in open chain. - This exercise starts with legs flexed and trunk rotated towards the contralateral side extending the arm with the hand at the level of the patella. Then rotate and extend legs and trunk to a vertical orientation while retracting the scapula with the elbow flexed.

Closed chain exercises like the wall slides activate the serratus anterior in positions above 90° of humeral elevation and can be performed adding kinetic chain component with trunk and hip flexion/extension. It can be done as, (I) Starting with legs and trunk flexed and holding a cloth, push the cloth up the wall as extend legs and trunk. (II) Stand facing a wall placing the ulnar border of both hands touching the wall. Gently push into the wall and slide hands upwards.

Strengthening programs should start with the scapular stabilizers, including the lower trapezius, rhomboids, and serratus anterior.

The low row and the inferior glide are isometric exercises that activate the lower trapezius and serratus anterior, two key muscles for scapular stability. (Rowing exercises can be added further for more intense training). Low row - Standing up, place the hand on the anterior edge of a solid surface and push against it as retract and depress the scapula. Inferior glide - Sitting beside a surface with the arm abducted and elbow extended, therapist can apply pressure adducting the shoulder and depressing the scapula. [4,5]

The Blackburn exercises are optimal for stimulation of lower trapezius being the “Y” the optimal exercise for this purpose. This exercise is performed abducting the arm overhead in 120° in external rotation with the patient in prone position. [4,5]

The push up plus exercise activates the serratus anterior muscle with minimal activation of upper trapezius. The serratus anterior muscle is key as it is the only scapulothoracic muscle that produces upward rotation of the scapular with AC joint external rotation and posterior tilting. (One can start wall push up plus exercise before progressing towards the proper push up plus exercises regime).

Strengthening of the posterior part of deltoid and triceps muscles is also recommended because they play an important role in the stabilization of the glenohumeral joint. [4,5]

Conclusion:

This non-surgical physiotherapeutic outlook can help the patient/injured athlete with MDI shoulder to rehabilitate in a better manner than hardwood old physiotherapeutic approach.

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REFERENCES

1. Neer CS II, Foster CR. Inferior capsular shift for involuntary inferior and multidirectional instability of the shoulder. A preliminary report. *J Bone Joint Surg Am* 1980; 62(6): 897-908. [<http://dx.doi.org/10.2106/00004623-198062060-00004>] [PMID: 7430177]
2. Mahaffey BL, Smith PA. Shoulder instability in young athletes. *Am Fam Physician*. 1999 May 15;59(10):2773-82, 2787. PMID: 10348070.
3. *Clinical Orthopaedic Rehabilitation*, 2nd edition. SB Brotzman, KE Wilk. Mosby 2003.
4. Ruiz-Ibán, Miguel & Heredia, Jorge & Navlet, Miguel & Serrano, Francisco & Oliete, María. (2017). Multidirectional Shoulder Instability: Treatment. *The Open Orthopaedics Journal*. 11. 812-825. 10.2174/1874325001711010812.
5. Kibler WB, Sciascia A. The role of the scapula in preventing and treating shoulder instability. *Knee Surg Sports Traumatol Arthrosc* 2016; 24(2): 390-7.