

Rehabilitation of Rotator cuff Repair

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Introduction

When start?
How much rehab?
Under therapist' supervision or physician?
Few prospective studies

Basic Anatomy and Biomechanics

Rotator cuff
Composed of four muscuotend,unit
Fused into contiguous envelope surrounding G-H jt.

Basic Anatomy and Biomechanics

Histology of Rotator cuff insertion
Fibrocartilage buffer
Minimize tendon fiber separation
But, low endurance to tensile, torsion compression force.
Especially, weak articular side than bursal (x2).
Nakajima J,shoulder elbow surg. 1994

Basic anatomy

In the midrange of motion, most joint stability is through the dynamic action of the rotator cuff and biceps tendons through concavity-compression of the humeral head and by dynamic barrier.

-Codman,Saha,...

The ligamentous structure function only at the extreme position of rotation.

Basic Anatomy and Biomechanics

Weakness of rotator cuff



Laxity of jt in midrange of motion

2° pathologic tensile or compressive load

This is why exercise directed toward rotator cuff strengthening

Basic Anatomy and Biomechanics

Rotator cuff and Deltoid

Equal abduction torque

Initial deltoid contraction

primarily shear force and migration of humeral head superiorly

Scapulothoracic muscles

Trapezius (upper,middle, lower)

Serratus anterior (upper,lower digitation)

Levator scapula

Rhomboids (major,minor)

Pectoralis minor

Scapulothoracic muscles

Classically as force couple activity achieving lateral scapular rotation

Muscle provide a stable base

Scapular rotation resultin deltoid fiber maintaining efficient length

Prevent impingement

Orient scapula and positioningof glenoid surface

Scapular muscle balance

Lateral rotation

Abduction/Adduction

Elevation/depression

Abduction/Adduction

At Foreward elevation

Scapular abduction by serratus anterior

At Abduction

Scapular adduction by mid,lower T rhomboids

Elevation/depression

Scapular elevation by nearly all

Scapular depression only by mid,lower trapezius

Scapular dyskinesia

- Often overcompensation of scapular elevator and weak depressor
- scapular elevation and ant. Tilt
- ineffective scapular adduction
- impingement

Rehab protocol by Neer

- After open surgery
- Immediate postop motion
- CPM upto 48hrs
- Passive elevation and E/R
- After 3mo, strengthening and posterior capsular stretching

Rehab protocol by Rockwood & Matsen

- After open surgery
- Immediate postop motion
- CPM upto 48 hrs
- Passive elevation and E/R
- After 3mo, strengthening and posterior capsular stretching

Rehab protocol After mini-open surgery

- In abduction brace 45°
- Early passive motion begins within first 24 hours
 - passive forward flexion
 - passive external rotation
 - circular Codman exercise
 - forward flexion with a pulley
 - assisted external rotation
- Assistive exercise program for 6 weeks
- At 6 to 8weeks postoperatively
- 10 and 12 weeks postoperatively

Rehab protocol by S.J Snyder

- After Arthroscopic surgery
- Ultra Sling neutral rotation brace for 5~6 weeks



Shoulder shrugs and scapular adduction exercises on the 1st day
Pendulum exercises are begun after 1st week and internal and external excersies with arm in neutral rotation are added as long as subscapularis and posterior cuff are intact
At 3 to 4 weeks, offered a pool therapy program for passive mobilization
At 6 weeks, active assisted elevation with a pulley or a physical therapist
Resisted exercises for the cuff and scapula are added
At 3 months,
daily activitis are allowed
but, no strenuous work or sports should be performed

Rehab protocol by S.J Snyder

After Arthroscopic surg. of Massive rotaror cuff tears
No need to immobilize the arm in abduction brace
Passive abduction at 5 to 6 week
Active motion at 7 to 8 week

Rehab protocol By S.S. Burkart

Immobilization for 6 weeks
tie failure and biologic healing
Postop, kept in a sling for 6 weeks, only passive external rotation.
At 6 weeks, overhead motion
At 10 weeks resistive exercises were initiated.

Author' protocol

For arthroscopic repair of small/medium tear
Phase I;0~4 weeks
0
immobilization in sling
pendulum
PROM F/E
1w
PROM E/R, Extension
active scapular Ex.
3w
AAROM E/R in abd

Author' protocol

For arthroscopic repair of small/medium tear

Phase II;4~6 weeks

all stretching

I/R, X-body abd.

Phase III;6~12 weeks

phase I strengthening

Resisted scapular strengthening

manual resistance for rotator cuff, deltoid

Phase IV;12w~6mo

Return to sport, occupation

Author' protocol

For arthroscopic repair of large/massive tear

Phase I;0~6 weeks

0

immobilization in sling

pendulum

1w

PROM F/E, PROM E/R

active scapular Ex.

Author' protocol

For arthroscopic repair of large/massive tear

Phase II;6~12 weeks

all stretching, I/R, X-body abd. Extension

rotator cuff isometric, phase I strengthening

active scapular Ex.

Phase III;12~16 weeks

phase II strengthening

Resisted scapular strengthening

manual resistance for rotator cuff, deltoid

Phase IV;16w~6mo

Return to sport, occupation



Take Home message

One part of treatment

Must be individualized

Progress into phase I, II stretching and strengthening, and then feedback