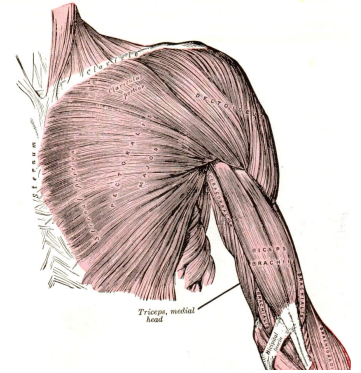


Pectoralis Major Muscle Rupture

The pectoralis major muscle is the large muscle in front of the upper chest. There are two parts of the pectoralis muscle, the pectoralis major and the pectoralis minor. The pectoralis major is the larger of the two, and works to push the arms in front of the body, such as in doing a push-up or bench press exercise.



The pectoralis major muscle, or most commonly its tendon that attaches to the arm bone (the humerus), can rupture. Athletes commonly call this a "pec rupture" but it is more accurately called a pectoralis major muscle rupture. Pectoralis major ruptures are uncommon injuries that occur almost exclusively in men between the ages of 20 to 50. While partial tears can occur, these are less common, and usually a complete rupture of the tendinous attachment of the muscle to the bone occurs.

How does a pectoralis major muscle rupture occur?

These injuries generally occur during forceful activities. A large number of pectoralis major ruptures occur during weightlifting, particularly during a bench press exercise. Other causes of a pectoralis major rupture include football, wrestling, rugby, and other causes due to trauma.

It is known that anabolic steroid use can weaken the tendon, and this is thought to be a contributing factor in many pectoralis major muscle ruptures in body-builders and weight-lifters. However, these injuries can certainly occur in patients who have never used steroids.

What are the symptoms of a pectoralis major muscle rupture?

Patients who experience a pectoralis major rupture feel sudden pain, and often a tearing sensation in their chest. Symptoms include

- Pain in the chest and upper arm
- Weakness in pushing the arms out in front of the body
- Bruising in the chest and arm
- A dimpling, or pocket, formed just above the arm pit where the rupture occurred

Treatment of a Pectoralis Muscle Rupture

Surgery is most often recommended for complete tears of the pectoralis muscle tendon. Patients who have partial tears, tears within the muscle, or elderly and low-demand patients, may be able to avoid surgical treatment.

By repairing the torn tendon, patients have a good chance at returning to high-level sports and activities. Ideally the repair is performed in the early period following the injury. By performing the repair within several weeks of the injury, scar tissue and muscle atrophy are minimized.

The repair is performed by placing sutures in the torn tendon, and then securing these sutures to the arm bone with either holes in the bone or anchors inserted in the bone.

Sources:

Petilon, J, et al. "[Pectoralis Major Muscle Injuries: Evaluation and Management](#)" J Am Acad Orthop Surg, Vol 13, No 1, January/February 2005, 59-68.

Schepesis AA, et al. "[Rupture of the pectoralis major muscle: Outcome after repair of acute and chronic injuries](#)" Am J Sports Med 2000;28:9-15.

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Rehabilitation after Pectoralis Major Tendon Repair

Phase 0: 0 to 2 weeks after surgery

POSTOPERATIVE INSTRUCTIONS

You will wake up in the operating room. A sling and an ice pack will be in place. You will go to the recovery room and generally will be discharged after 1-2 hours. You can get out of bed when you wish. Apply ice to the front of the shoulder to reduce pain and swelling. You may remove the sling whenever you wish and gently move the elbow, wrist and fingers. Follow Dr. Gill's instructions regarding moving your shoulder after surgery.

GOALS:

1. Control pain and swelling
2. Protect the repair
3. Begin early shoulder motion

ACTIVITIES WHEN YOU GO HOME:

1. Apply ice to the shoulder as tolerated to reduce pain and swelling. You can change the dressing to a smaller one to allow the cold therapy to reach the shoulder.
2. Remove the sling on the first day after surgery.
Move your elbow, fingers and hand several times a day.
3. Begin the pendulum exercise several times a day:



Pendulum exercise

Bend over at the waist and let the arm hang down. Using your body to initiate movement, swing the arm gently forward and backward and in a circular motion. Repeat for 2 to 3 minutes at a time.

4. Remove the outer dressing on the second day after surgery and shower. Leave the little pieces of tape (steri-strips) in place. You can get the wound wet after 2 days in a shower, but do not soak in a tub. To wash under the operated arm, bend over at the waist and let the arm passively swing away from the body. It is safe to wash under the arm in this position.

5. Keep your elbow slightly in front of your body; **do not reach behind your body.** When putting on clothing, lean forward and pull the shirt up and over the operated arm first. Then put the other arm into the opposite sleeve. To remove the shirt, take the unoperated arm out of the sleeve first, and then slip the shirt off of the operated arm.



6. Call Dr. Gill's office for any concerns, including, but not limited to, severe pain, fevers, chills or redness.

OFFICE VISIT: Please arrange to return to Dr. Gill's office in the office 10-14 days after surgery.



Rehabilitation after Pectoralis Major Muscle Repair

Phase One: 2 to 6 weeks after surgery

Goals:

1. Protect the repair
2. Ensure wound healing
3. Prevent shoulder stiffness

Activities:

1. Slings

Use your sling as instructed by your doctor. You may remove it whenever you wish if you are careful and keep the shoulder safe. Put the sling on when you are outside or in a crowd. Keep the sling on when sleeping at night for the first three or four weeks.

2. Use of the operated arm

You may use your hand on the operated arm as long as you **do not** rotate the arm externally or away from your body. You should bend your arm at the elbow and use your fingers and hand, such as to reach up and touch your face. Keep your elbow in front of you.

3. Bathing and showering

You may shower or bath and wash the incision area. To wash under the operated arm, bend over at the waist and let the arm passively swing away from the body. It is safe to wash under the arm in this position. This is the same position as the pendulum exercise. **Do not** submerge the incisions under water

ICE

Days per Week: 7 as necessary 15- 20 minutes Times per Day: 4-5

STRETCHING / PASSIVE MOTION

Days per Week: 7 Times per day : 4-5

Program:

Range of Motion

Pendulum exercises

Supine External Rotation

Weeks 1 and 2: limit to 0 degrees
(straight up)

Weeks 3 to 6: limit to 30 degrees.

Supine forward arm elevation.

Starting at **3rd week** after surgery:
Behind the back internal rotation.

Strengthening exercises

Isometric exercises:

External rotation at neutral.

Prone row

Prone extension (do not extend past hip)

Side-lying external rotation

Rhythmic stabilization and

proprioceptive training drills with

physical therapist. Ball squeeze exercise.



Rehabilitation after Pectoralis Major Repair

Phase Three: 8 to 12 weeks after surgery

Goals:

1. Protect the shoulder repair
2. Regain full range of motion
3. Continue gentle strengthening

Activities:

1. Use of the operated arm

You may now use your arm in a more normal fashion. You may move the arm into all positions including external rotation and behind the back if it is comfortable. Avoid having the arm forcefully pulled behind you. Continue to avoid heavy weight lifting or manual labor. Follow any further instructions given to you by your doctor.

2. Precautions

Do not lift heavy weights overhead with the weight going behind the head. In other words, keep the weights in front of you where you can see them.

Exercise Program:

STRETCHING / MOTION

Days per week: 7 Times per day: 1-2

Pendulum exercises

Standing external rotation /doorway

Wall slide stretch

Hands-behind-head stretch

(Starting the 9th week after surgery)

Behind the back internal rotation

Supine cross-chest stretch

Sidelying internal rotation

STRENGTHENING / THERABAND

Days per week: 7 Times per day: 1

External rotation

Shoulder shrug

“W”'s

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STRENGTHENING / DYNAMIC

Days per week: 7 Times per day: 1

Side-lying external rotation

Prone horizontal abduction 'T's

Prone scaption "Y"s

Prone row

Prone extension

Standing scaption "full-can" exercise

Rhythmic stabilization and proprioceptive training drills with physical therapist

Rehabilitation after Pectoralis Major Muscle Repair

Phase Four: 12 to 24 weeks after surgery

Goals:

1. Protect the ligament repair
2. Regain full range of motion
3. Continue strengthening
4. Gradual return to full activity

Activities:

Use the arm for normal daily activities. There is no restriction on your range of motion unless exceptions are outlined in your discussions with your doctor. Weight training can gradually resume with caution being paid to exercises such as bench press, incline press, dips, pull-downs behind the neck or other exercises where the hands are repeatedly placed behind you. If you are returning to contact sports, you should wait until six months after surgery.

Exercise Program

STRETCHING / RANGE OF MOTION

Times per day: 1 Days: 5-7

Standing External Rotation / Doorway

Wall slide Stretch

Hands-behind-head stretch

Behind the back internal rotation

Supine Cross-Chest Stretch

Sidelying internal rotation

External rotation at 90° Abduction stretch

STRENGTHENING / THERABAND

Times per day: 1 Days per week: 3

Continue exercises from phase 3



Internal Rotation

Forward Punch

Dynamic Hug

Diagonal down

Optional exercises:

External rotation at 90°

Internal rotation at 90°

Standing 'T's

Diagonal up

STRENGTHENING / DYNAMIC

Times per day: 1 Days per week: 3

Continue exercises from phase 3

Prone external rotation at 90° abduction "U's

Biceps curls

Resisted forearm supination-pronation

Resisted wrist flexion-extension

PNF manual resistance with physical therapist

Push-up progression

PLYOMETRIC PROGRAM

May begin with clearance from your physical therapist.

WEIGHT TRAINING

See weight training precautions section

INTERVAL SPORTS PROGRAMS

May begin with clearance from your doctor.

Guidelines for Returning to Weight Training After Pectoralis Major Repair

You should not return to training using heavy weights or on weight machines until your doctor determines that it is safe. In general, it is usually safe to return to limited weight training at three months following tendon repair.

Before embarking on a weight-training program, you should have full range of shoulder motion and normal strength in the rotator cuff and scapular muscles. Dr. Gill or your physical therapist will test your motion and strength before you start weight training.

When starting your weight-training program, you can start with 3 sets of 15-20 repetitions. Training with high repetition sets ensures that the weights that you are using are not too heavy.

NEVER perform any weight training exercise to the point of muscle failure. "Muscle failure" occurs when, in performing a weight training exercise, the muscle is no longer able to provide the energy necessary to contract and move the joint(s) involved in the particular exercise. Joint, muscle and tendon injuries are more likely to occur when muscle failure occurs.

The following weight training exercises should be avoided at this time after Pectoralis Major repair:

1. Pull downs behind-the-neck (wide-grip)
2. Behind-the-neck shoulder press
3. Bench press
4. Triceps press overhead

The following exercises require special cautions:

1. Pull downs should only be done in front of the head, to the chest, with a medium (not wide) grip.
2. Shoulder press overhead should be done carefully, avoiding heavy weights. If doing shoulder presses, always start with the hand in front of the shoulder and end overhead where you can still see your hand. For persons using barbells, this is the "military press".
3. You should return to bench pressing under the direct supervision of you doctor and physical therapist
4. Lateral deltoid raises should be avoided because of the impinging and wearing effect on the rotator cuff. Forward raises in the "thumb-up" position are usually safer and can be done with reasonable weights. Lateral raises from the prone or bent over position can be done as a substitute for standing lateral deltoid raises.
5. Do not do the incline or decline bench press exercises at this time.
6. Do not do any type of 'chest-fly' or 'Pec-Deck' or dipping exercise at this time.

7. For triceps exercises, triceps pushdowns on a pulley system are safe as well as bent-over triceps extensions.
8. When doing the upright-rowing exercise, keep your grip at least 12 inches apart. When pulling the bar upward toward the chin, do not raise the bar higher than the point at which the elbow reaches shoulder level.

Exercises Usually Problem-Free

1. Biceps Curls
2. Cable and bent-over rowing
3. Shoulder shrugs

If your goal is returning to high-level weight training or weight lifting, it will take 3 to 6 months of cautious, gradual progression to return to top form. In general, avoid increasing the amount of weight lifted by more than 10-15% (at a time) of your present working weight every 10-14 days.

Remember: Weight training is beneficial to improve muscular strength and protect the joints from injury. If done improperly by using too much weight and/or improper technique, weight training can cause serious injury.

It is recommended that you do not return to bench pressing or chest fly exercises until after 6 months post-surgery. Consult with Dr. Gill and your physical therapist in cases where bench press and other Pectoral exercises will be part of your conditioning program.