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When is a conservative approach best for proximal biceps tendon rupture?

This case demonstrates that when a patient's occupation and lifestyle do not require a high degree of supination and upper arm strength, conservative treatment may be the way to go.

CASE ► Mr. A, a 59-year-old high school science teacher, came into our medical clinic with severe pain (7/10) in his left shoulder and arm and weakness on flexion of his left elbow. A week earlier, he felt a "pop" and experienced sharp pain and immediate "swelling" of the left biceps after throwing a heavy trash bag away while at work. He went to the school nurse for evaluation and was referred to a physician.

Mr. A was healthy, had no chronic diseases, and reported no previous injuries or trauma. He denied smoking, drinking alcohol, using illegal drugs, or taking steroids or other medications. He had worked as a high school teacher for the last 10 years at the time of his clinic visit.

■ Imaging, physical exam tell the tale.

The patient's physical exam was normal, with one outstanding exception: a "Popeye" deformity in his left biceps (FIGURE), accompanied by severe pain and tenderness to palpation over the proximal aspect of the left biceps. Both active and passive range of motion of the elbow were full and symmetrical, but the patient had prominent pain and weakness on elbow flexion and supination. However, he had good rotator cuff strength without pain and no impingement signs or acromioclavicular joint pain. He had no atrophy or scapular dyskinesia. Similarly, a neurovascular exam of the distal aspect of the extremity was normal.

The magnetic resonance imaging report revealed a complete tendon rupture of the long head of the biceps brachii muscle. The long head muscle was intact and there was a posttraumatic hemorrhage in the region of the tear in the upper arm. The remaining muscle, ligaments, and tendon were intact. There was no evidence of a fracture.

■ **A 3-pronged approach.** Once the diagnosis of acute complete rupture of the left long head tendon biceps brachii was reached, we laid out a 3-pronged treatment approach:

- nonsteroidal anti-inflammatory agents and muscle relaxants such as cyclobenzaprine, tizanidine, or metaxalone
- physical therapy (2-3 times per week) and daily home exercise
- modified activities—specifically, no overhead work or lifting of anything >10 lb with the affected arm.

Before we proceeded with this plan, we referred the patient to a specialist for evaluation and a second opinion.

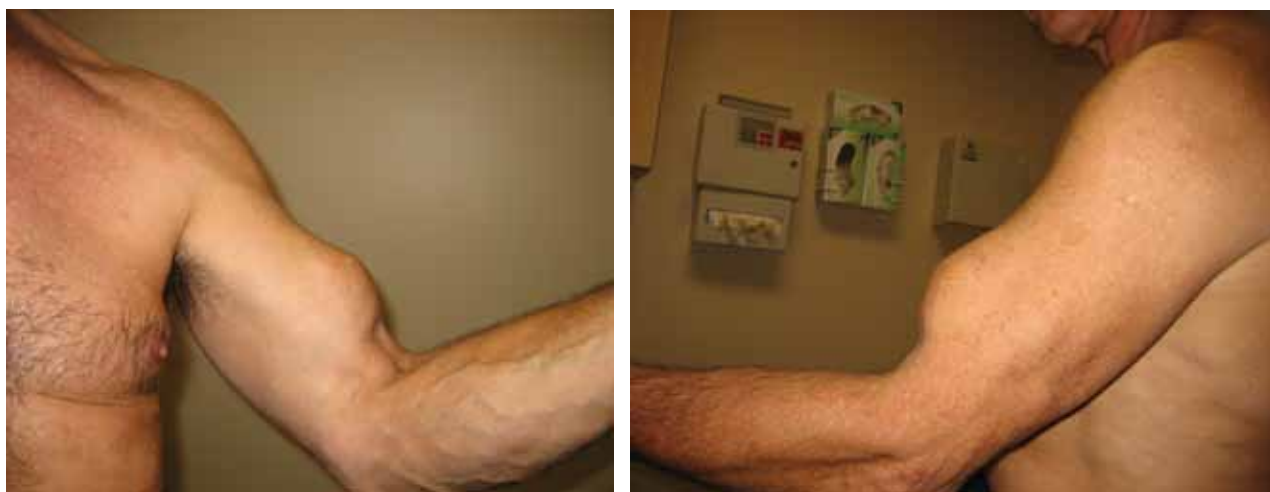
Biceps tendon rupture usually follows a traumatic event

Long head biceps tendon ruptures often involve people between 40 and 60 years of age, with men affected significantly more often than women.^{1,2} Tennis players and ballplayers are also affected, as a result of frequent swing-

FIGURE

“Popeye” deformity in left biceps

PHOTOS COURTESY OF: SOPHA PUGACH, MD



With long head tendon rupture, the muscle belly retracts, causing “Popeye” biceps. Since only the long head tendon—and not the short head tendon—is involved, the biceps still functions.

ing motions.³ As you might expect, a person’s dominant arm is more often affected.³

Excessive weightlifting or rapid stress upon the tendon can cause an acute tendon rupture. As a rule, biceps tendon ruptures are caused by a single traumatic event that typically involves lifting a heavy object while the elbow is bent at a 90-degree angle. Weight lifters who use anabolic steroids are at an increased risk of sustaining a rupture at the tendon, and clinicians may also see such ruptures among patients who have fallen forcefully onto an outstretched arm.^{2,3}

Keep in mind, however, that rupture can also occur in the absence of a traumatic event. This usually happens in elderly individuals with advanced tendon degeneration.⁴ Smoking, rheumatoid arthritis, steroid medications,^{2,5} fluoroquinolones,⁶ and statin therapy⁷ can affect this tendon and increase the risk of spontaneous rupture, as well.

■ **“Popeye” biceps—a telltale sign.** Understanding the function of the biceps brachii helps explain at least one of the telltale signs of long head tendon rupture. The biceps muscle enables supination of the forearm and flexion of the elbow. With long head tendon rupture, however, the muscle belly retracts, causing prominent fullness and bulging of the upper arm—what’s called “Popeye”

biceps. Because the rupture involves only the long head tendon of the biceps and not the short head tendon, the biceps still functions.⁸

Surgical repair vs conservative management

Whether to pursue surgery or conservative management when caring for a patient with a biceps rupture remains a subject of debate in the medical literature. There are no studies that demonstrate the superiority of one approach over the other.^{2,5,9,10}

■ **Surgery.** The serious complications associated with surgery have led some experts to question whether the risks of surgery outweigh the benefits.¹¹ Equally important is the patient’s individual circumstances. Clinicians need to consider each patient’s occupation, lifestyle, and age when recommending a course of action.

Published clinical guidelines usually recommend surgical repair for young athletes who require maximum supination strength in daily activities. Although the size of the Popeye deformity does diminish after conservative treatment, surgery is often recommended for patients who are unwilling to accept the cosmetic defect seen after the tendon ruptures. And finally, operative treat-

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 Consider a patient's occupation and lifestyle before choosing between biceps tendon repair surgery and more conservative therapy.

ment is indicated for middle-aged carpenters and manual laborers whose occupations require full supination and arm strength.^{2,12-14}

The surgical procedure, called tenodesis, involves reattaching the torn section of the tendon to the bone.^{5,15} A recent study involving 5 professional wrestlers injured while performing noted that tenodesis restored full biceps function, gave excellent cosmetic results, and allowed all of the young men to return to wrestling.¹⁵

Conservative treatment. A conservative approach is appropriate for older patients when their profession and lifestyle do not demand a high degree of supination and upper arm strength.^{5,8,13,14} In addition, the more conservative approach is very well tolerated, which reduces the risk of serious complications and the cost of surgery.¹¹ Avoiding surgery also permits patients to return to work much sooner.

Patients may, however, lose up to 20% of their supination strength with conservative treatment.¹⁴ But this approach does not cause weakness in grip, pronation, or elbow extension. Nor does it affect patients' activities of daily living,¹⁴ which may explain why more patients are treated conservatively than with surgery.^{5,11} Additionally, some experts recommend nonoperative treatment of distal biceps tendon ruptures for people who are wary of surgery or present late with the injury.¹¹

CASE ➤ Two orthopedic surgeons examined our patient and both supported our recom-

mendation to pursue conservative treatment for Mr. A.

Over the next 4 to 6 weeks, he received physical therapy 2 to 3 times per week. With the help of the physiotherapist, Mr. A performed joint mobilization and flexibility exercises to improve the range of motion in his shoulder. The therapist also helped him with strengthening and stretching exercises to restore the strength of his biceps and elbow muscle.

At home, our patient's regimen included elbow bend and straighten movements, elbow supination and pronation movements, and static biceps contractions.

Over time, his pain diminished and the strength in his left arm improved. Mr. A was able to return to work with modified duty, 2 to 3 weeks after his injury. By Week 8, he had full range of motion in his left arm and normal strength. He was able to do his job as a high school science teacher without any restrictions, but continued to have the Popeye deformity.

Our experience treating Mr. A serves as a reminder to physicians that complete long head biceps tendon rupture can be successfully treated conservatively. Patients working in sedentary occupations usually do not need a high degree of supination or physical strength in their upper extremities, making this a worthwhile treatment option for them. **JFP**

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