

## **BICEPS TENDON TEAR AT THE SHOULDER**

Tear of the long head of the biceps tendon

### **Anatomy -**

The biceps is the large muscle at the front of your arm. Its main function is in bending the elbow. It also has a minor function in rotating the forearm to bring the hand into a palm upward position (called supination). There are several other muscles that perform both of these functions.

The biceps is so named because it has two parts to it. The biceps is formed by the “long head” and the “short head” muscles are attached to the bone by tendons. The tendon of the long head of the biceps attaches to the top of the shoulder socket. The tendon of the short head of the biceps attaches to a bone at the front of the shoulder called the coracoid process. The coracoid process is part of the scapular. These two components of the biceps come together and merge into a muscle belly. This muscle belly has another major tendon at the front of the elbow which is easy to feel.

### **Types of tears –**

- a) Complete tears – a complete tear of the long headed biceps occurs when none of the tendon remains attached to its origin at the shoulder socket.
- b) Partial tears – partial tears imply that some of the fibres remain in tact. Many tendon tears start with tendon fraying and tendon degeneration. As that wear continues the tendon may then completely tear, sometimes with a relatively minor incident.

There are some factors specific to the long head of biceps which mean that it is prone to tearing. It is at risk because it travels up through the shoulder joint and passes between two of the tendons of the rotator cuff. It can be subject to wear as the tendons rub against bone (called impingement).

The short head of biceps is outside the shoulder joint and is not vulnerable to injury and rarely torn.

The implication of this is that even with a tear of the long head of biceps there is still a significant functioning part of the muscle.

A tear of the long head of biceps is also significant because it can be a warning of associated tearing to the rotator cuff tendons.

### **Cause –**

- a) Injury – the long head of biceps tendon is occasionally ruptured during a fall on to an outstretched arm or with sudden heavy lifting causing forced contraction of the biceps.

- b) Impingement – The long head of biceps tendon can tear as a result of gradual fraying of the tendon. This can occur as a result of impingement which is contact between the tendon and the acromion bone above it. Overuse can contribute in this scenario with repetitive shoulder motion causing accelerated rubbing and wear.
- c) Degeneration – All tendons in the body are subject to age related degeneration and this can be a factor in tearing of the long head of biceps. Often there may be preceding degeneration of impingement and then tearing as a result of the relatively minor injury.

### **Risk factors –**

- a) Age related - tendon degeneration is a significant contributing factors in many cases
- b) Heavy overhead activity – rupture of the long head of biceps is quite commonly seen in weight lifters and body builders. It is also seen in Olympic level gymnasts. Some occupations are prone to this injury including such jobs as ceiling fixer where the bulk of the work is heavy overhead manual duties.
- c) Shoulder overuse in sport – sports that involve repetitive shoulder motion such as swimming are associated with tendon fraying and tearing.
- d) Smoking – smoking impacts on small blood vessels which supply the tendon and increase the risk of tendon tearing and reduce the tendons ability to heal.
- e) Cortico steroid medication – steroid medication may cause tendon weakness particularly where steroids are injected into the tendon.

### **Symptoms –**

- Sudden onset pain in the upper arm
- Snapping or popping sensation
- Visible deformity of the muscle with marked bulging. This is the so called “Popeye” muscle deformity.
- Bruising which appears in the arm running down to the elbow
- Weakness of the arm
- Pain and weakness turning the hand palm upwards

### **Medical examination –**

A complete rupture of the long head of biceps is generally obvious because it produces the Popeye muscle deformity. Partial ruptures are much more difficult to diagnose. They can be a cause of shoulder pain which is not identified until subsequent investigations.

The examination for biceps tendon ruptures should also continue an examination of the shoulder tendons because of the association between rotator cuff tearing and biceps tendon tearing. It may be necessary to have

further investigations of the rotator cuff even if the diagnosis has already been made in relation to the biceps tendon tear.

Investigation usually would include x-rays and then either a ultrasound or MRI scan to evaluate the rotator cuff if necessary.

### **Treatment –**

- a) **Non surgical treatment** – for the great majority of injuries the treatment will be non surgical. The pain resulting from the tear and the bleeding and bruising will resolve over a period of up to three months. Initial treatment is with rest, ice, and anti inflammatory medications. Subsequently physiotherapy may be beneficial in restoring strength.

Most patients are very surprised that we treat this injury without surgery. There is an obvious deformity and the natural assumption is that surgery is required to fix that deformity. However orthopaedic treatment focuses on restoring function. There is minimal loss of function as a result of a tear of the long head of biceps. There is almost no appreciable loss of strength with respect to bending the elbow. There are several other muscles which perform this function and they can be strengthened with physical therapy.

There may be a very slight loss of strength of supination which is the function of turning the palm upwards. This has relevance in only very limited circumstances in relation to some occupations or sporting activities. For most sports and occupations it is possible to return back to normal function with a complete rupture of the long head of biceps tendon.

- b) **Surgical treatment** – surgery is rarely required for this injury. If your sport or occupation involves repetitive supination movements, such as turning valves, surgery may be a consideration.

In reality most patients who are requesting surgery do so for cosmetic reasons. There is a visible Popeye deformity with this injury. However, when the tendon tears, it may pull down quite some distance in to the arm. Sometimes surgery can be performed with a key hole technique but not infrequently an incision will be required to identify the tendon end. The cosmetic impact of a scar may negate any benefits from the restoration of muscle shape.

Furthermore the tendon may be torn or degenerative over a long area and the repaired tendon can re-rupture in the early post operative period. Following surgery a sling is required to protect

the tendon repair for four to six weeks. Heavy physical work or sporting activities would be restricted for at least three months.

Bearing in mind the significant post operative restrictions and minimal benefits of surgery it is easy to see why non operative treatment is preferred for this condition.

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