CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

PATIENT INFORMATION — IN DEPTH

Biceps Tendinopathy and Long-Head Rupture

A ruptured long head of biceps can ball up into a 'Popeye' bulge in the upper arm.

What you're feeling

The biceps is the muscle at the front of your upper arm. The long head of its tendon runs up over the top of the arm bone and into the shoulder joint, and this is the part that causes trouble here.

The most common complaint is a deep, nagging **pain at the front of the shoulder**, often a few centimetres below the tip. It can ache when you reach overhead, lift, or carry, and it sometimes radiates down the front of the upper arm. Many people find it hard to point to one exact spot. Because the biceps tendon sits right beside the rotator cuff, this pain very often comes alongside rotator cuff problems, and the two can be difficult to tell apart without an examination.

Sometimes there is a more dramatic event. The worn tendon can snap, usually in older people and often with surprisingly little pain. When this happens, the muscle belly drops down the arm and forms a soft bulge that looks like a small ball or a flexed muscle. This is the classic **"Popeye" sign**. It can be startling to see, but on its own it is rarely as serious as it looks.

What's actually happening

Tendons are tough cords that connect muscle to bone, and like any well-used rope they can fray with time. In **biceps tendinopathy**, the long head tendon becomes inflamed and worn where it travels through a narrow groove at the top of the arm bone and into the shoulder. That wear is what you feel as the front-of-shoulder pain. Because the tendon shares this crowded space with the rotator cuff, the two often wear together, which is why biceps pain and cuff pain so frequently travel as a pair.

If that fraying continues, the tendon can eventually give way completely. When the **long head ruptures**, the muscle is no longer tethered at the top, so it slides down the arm and produces the Popeye bulge. Here is the reassuring part: the biceps actually has two anchors at the shoulder (the long head and the short head), and the

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

short head stays intact. So when the long head goes, the arm keeps most of its strength, and the change is mainly in appearance.

This is an important distinction. A **proximal** rupture (at the shoulder end) is usually a minor problem. A rupture at the other end of the muscle, at the elbow (a distal biceps rupture), is a very different situation: that one can cause real loss of strength and often needs surgical repair. The bulge can look similar, so it matters which end has actually torn.

What we can do about it

In our clinic, Dr Kieran Hirpara guides patients through a clear pathway that begins with a thorough assessment to confirm the diagnosis. We typically recommend starting with non-surgical care for long-standing issues, reserving surgery only when those measures have not provided enough relief.

For **biceps tendinopathy**, the first steps are simple and non-surgical, and they settle most people:

- **Activity changes:** easing off the overhead and heavy-lifting movements that aggravate it, while keeping the shoulder moving.
- **Physiotherapy:** guided exercises to settle the tendon and rebalance the shoulder, especially when the rotator cuff is involved too.
- **Anti-inflammatory medication:** a tablet to take the edge off pain and inflammation.
- **An injection:** sometimes a corticosteroid injection around the tendon or in the shoulder is used to calm a stubborn flare.

Surgery is reserved for ongoing pain that hasn't settled with these measures. When it is needed, there are two main options. The tendon can be cut so it no longer pulls on the sore area (a **tenotomy**), which often leaves a Popeye bulge but reliably relieves pain. Or it can be re-anchored lower down the arm bone (a **tenodesis**), which keeps the muscle's normal shape and avoids the bulge but involves a longer recovery. These procedures are frequently done at the same time as rotator cuff surgery, since the two problems so often occur together.

For a **proximal long-head rupture**, the usual advice is **no surgery at all**. There is little loss of strength, and the bulge is mainly cosmetic. Some younger or more active people, or those bothered by the appearance or by muscle cramping, may choose a re-anchoring procedure, but for most people leaving it alone is the right call.

What to expect

Most biceps tendinopathy improves with patience and the right exercises. It can be slow (a few months rather than a few weeks), but the outlook is good, and the majority avoid surgery altogether. When the biceps problem is part of a wider rotator cuff issue, recovery follows the cuff, and treating both together gives the best result.

If you have had a proximal long-head rupture and decided against surgery, you can expect the initial soreness to fade over a few weeks, your strength to return to near normal, and the Popeye bulge to remain as a permanent but harmless reminder. It does not get worse over time, and it does not need to be fixed.

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

When to see someone

- **Front-of-shoulder pain that won't settle**, especially with overhead reaching or lifting: worth assessing, as it often signals a biceps or rotator cuff problem that responds well to treatment.
- A **sudden bulge in the upper arm that comes with weakness:** this needs to be looked at to confirm it is the harmless long head at the shoulder and **not** a tear at the elbow, which is a different injury that may need surgery.
- A **rupture in a younger or active person:** even a proximal one is worth reviewing, both to be sure of the diagnosis and to discuss whether repair is worthwhile for you.
- **Persistent biceps cramping or aching** after a known rupture: usually minor, but can be treated if it troubles you.

In more depth

This section goes further than you need for your own treatment decisions. Problems with the long head of biceps are worth the extra reading because of an unusual situation in surgery: the standard treatments involve detaching a tendon whose function has never been convincingly demonstrated in a living shoulder — and the evidence says you do not miss it.

A TENDON WITH AN UNPROVEN JOB

The long head of biceps runs from the top of the shoulder socket, through the joint, down a groove in the upper arm bone. Because it passes directly through the joint, it has long been assumed to help hold the ball centred in the socket.

The evidence for that is weaker than the assumption. Biomechanical studies indicate the tendon contributes to stability of the glenohumeral joint in all directions, but **in vivo studies have not established this stabilising effect**, and the physiological load required remains unknown [1].

This matters because it explains why the operations work. If the tendon were doing essential stabilising work, cutting it would have consequences. It appears not to.

CUTTING IT AND REATTACHING IT GIVE THE SAME RESULT

The two operations are tenotomy — releasing the tendon and letting it retract — and tenodesis, releasing it and fixing it to the arm bone lower down. Tenodesis is the more involved procedure and is usually presented as the better one.

Pooling **650** patients, there was **no difference in post-operative functional outcome** between tenotomy and tenodesis. The differences that emerged were confined to two things: a **Popeye deformity** — the muscle belly bunching in the upper arm — and **cramping pain in the bicipital groove**, both more frequent after tenotomy [2]. An earlier systematic review reached the same conclusion, finding comparably favourable results with the only major difference being the cosmetic deformity [3].

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au

The decision is therefore not really about how well the arm will work. It is about appearance, cramping, and how much surgery you want, which is a more honest framing than "the better operation".

AND WITHIN TENODESIS, THE TECHNICAL ARGUMENTS DO NOT SEPARATE

A good deal of debate concerns where and how to fix the tendon. It does not appear to matter much. Across **707** patients, subpectoral and suprapectoral tenodesis produced similar improvements with no difference in treatment failure, though arthroscopic tenodesis was associated with more stiffness early after surgery [4]. Comparing arthroscopic with open across **476** patients, both gave satisfactory outcomes with **no identifiable differences** [5].

Laboratory work does show real differences in construct strength — interference screws and more sutures produce stronger repairs, and supra- and subpectoral fixation are biomechanically equivalent once confounders are controlled [6]. That strength does not translate into a measurable clinical gap, which is a recurring pattern in shoulder surgery and worth recognising when a technique is described as stronger.

DIAGNOSIS IS THE GENUINELY DIFFICULT PART

Because treatment options perform similarly, most of the uncertainty sits earlier — in deciding that the biceps tendon is the source of the pain at all. It sits alongside the rotator cuff, and symptoms overlap.

Physical examination has been tested against what is actually found at arthroscopy. Performing the **uppercut test together with tenderness over the bicipital groove** has the highest combined sensitivity and specificity of the known manoeuvres [7]. That is useful precisely because it is a combination — no single test carries the diagnosis.

The practical consequence is that a biceps problem is most confidently identified when examination findings, imaging and the pattern of symptoms agree. Where they do not, the tendon may be a bystander, and an operation on it is unlikely to solve the problem.

REFERENCES

1. Elser F, Braun S, Dewing CB, Giphart JE, Millett PJ. Anatomy, function, injuries, and treatment of the long head of the biceps brachii tendon. Arthroscopy. 2011;27(4):581-92.
2. Gurnani N, van Deurzen DFP, Janmaat VT, van den Bekerom MPJ. Tenotomy or tenodesis for pathology of the long head of the biceps brachii: a systematic review and meta-analysis. Knee Surg Sports Traumatol Arthrosc. 2015;24(12):3765-71.
3. Slenker NR, Lawson K, Ciccotti MG, Dodson CC, Cohen SB. Biceps tenotomy versus tenodesis: clinical outcomes. Arthroscopy. 2012;28(4):576-82.
4. Belk JW, Thon SG, Hart J, McCarty EC. Subpectoral versus suprapectoral biceps tenodesis yields similar clinical outcomes: a systematic review. J ISAKOS. 2021;6(6):356-62.
5. Abraham VT, Tan BH, Kumar VP. Systematic review of biceps tenodesis: arthroscopic versus open. Arthroscopy. 2015;32(2):365-71.
6. Aida HF, Shi BY, Huish EG, McFarland EG, Srikumaran U. Are implant choice and surgical approach associated with biceps tenodesis construct strength? A systematic review and meta-regression. Am J Sports Med. 2019;48(5):1273-80.
7. Rosas S, Krill MK, Amoo-Achampong K, Kwon K, Nwachukwu BU, McCormick F. A practical, evidence-based, comprehensive (PEC) physical examination for diagnosing pathology of the long head of the biceps. J Shoulder Elbow Surg. 2017;26(8):1484-92.

CQ HAND + UPPER LIMB
Dr Kieran Hirpara — Specialist Orthopaedic Surgeon
Suite 2, Level 1, Mater Private Hospital Rockhampton, 31 Ward Street, The Range, QLD 4700
Phone 07 4863 6556 · office@cqupperlimb.com.au · cqupperlimb.com.au