

## BRACHIAL BICEPS RUPTURE

*Ricci M, Sembenini P, Vecchini E, Castellarin G, Costa A*

*Clinica Ortopedica, Università degli Studi di Verona, Italy*

### **Incidence**

Biceps tendon ruptures involve the long head in 96% of cases, while lesions of the distal head have an incidence between 3% and 10% and the short head is involved in 1% of cases. It is rare for the lesion to occur in the thickness of the muscle belly or on the muscle-tendon junction.

### **Pathogenesis**

Lesions can occur on a level with the proximal insertion of the biceps labrum complex (BLC)(1) going by the acronym SLAP (superior labrum anterior-posterior), especially in throwing sportsmen. There is often a correlation between BLC rupture or luxation and rotator cuff injuries. When a rotator cuff lesion occurs, the BLC becomes vulnerable to friction with the acromion and to functional overload because it is the only depressor of the rising humeral head. Sometimes the mechanism may be a direct trauma (*e.g.* in parachute jumpers), or indirect as a result of damage caused by traction in a contracted muscle (*e.g.* in weight-lifters). The mechanism behind distal tendon lesions is not well known; it is attributable to degenerative processes or friction in the tendon. Bony spurs on a level with the tuberosity of the radius, the use of anabolic steroids and chronic inflammation of the deep bicipital bursa can also contribute to degeneration of the tendon.

### **Physical Examination**

The tests to establish whether the BLC has suffered any damage are those recommended by Burkhead, Speed, Yergason, Hawkins and O'Brian. The objective examination of patients with total biceps rupture is quite straightforward because of the appreciable deformity; it is also a good idea to check the integrity of the rotator cuff in such cases.

In cases of partial lesions, the first step is to carefully assess the patient's active and passive motility of the scapulohumeral and elbow joints; then we go on to palpate the muscle belly and the proximal and distal course of the tendons, evoking pain and identifying any discontinuities. An extensive thoracic ecchymosis associated with the biceps lesion may mean that the rupture is not the only problem, otherwise the edema and ecchymosis would be restricted to the arm.

It is important to identify any associated nerve damage, *e.g.* lesions due to spraining of the brachial plexus or musculocutaneous nerve, which can occur in traumas due to a limb being extended backwards, especially in elderly patients.

### **Imaging**

In all cases of brachial biceps lesions, the first instrumental investigation to undertake is X-ray, which must be performed on the strength of specific clinical recommendations. Conventional X-ray has to be followed up and confirmed by ultrasound and/or magnetic resonance (MR) depending on the suspected diagnosis. If a lesion of the BLC at bicipital anchor level is likely, it is best to use MR or arthro-MR. If the lesion seems to be myotendineal or to affect the muscle belly, then ultrasound may suffice. If a distal tendon lesion is suspected, the complexity of this anatomical district makes MR imaging indispensable.

### **Treatment**

The treatment of SLAP lesions involves reattaching the tendon and lips with the aid of titanium alloy mini-screws, positioning the suture astride the BLC to ensure that it stays stable.

In the BLC luxations or partial intra-articular lesions in younger patients, with or without associated rotator cuff lesions, we use a new method of arthroscopic biceps tenodesis. This involves inserting an absorbable screw at the emergence of the bicipital groove.

Acute BLC ruptures in younger patients are treated by re-insertion on the humeral diaphysis. In elderly patients who do no heavy work and accept the unsightly sequelae on the arm, we prefer a conservative approach. If the patient shows no progressive improvement in terms of elbow flexion-supination and strength, then we have to resort to surgery.

In cases of conservative treatment of distal tendon lesions, initial short-term results tend to be followed by a

---



## The Rehabilitation of Sports Muscle and Tendon Injuries

---

progressive loss of strength and articular range in elbow flexion and supination (2), making surgical treatment indispensable in patients who need good recovery of strength and flexion-supination. Numerous techniques and surgical access routes have been described, using particular sutures and different types of anchor. Several complications have also been reported, such as radial nerve lesions and radioulnar synostosis. Another route that has been proposed for dealing with distal symptomatic partial brachial biceps lesions involves a posterior access: this is less risky, but only preliminary results are available for the time being. A new surgical method has been proposed, which involves the use of an endobutton fixed to the radius (3). An anterior access route is prepared and after suturing the distal part of the remaining tendon, a tunnel is created on a level with the tuberosity of the radius, achieving a stable fixation that enables an early and aggressive rehabilitation.

### **References**

1. Snyder SJ et Al. SLAP lesions of the shoulder. *Arthroscopy* 6(4): 274-9, 1990.
  2. Dobbie RP. Avulsion of the lower biceps brachii tendon: analysis of 51 previously unreported cases. *Am J Surg* 51: 662-3, 1941.
  3. Greenberg JA et Al. EndoButton-assisted repair of distal biceps tendon ruptures. *Shoulder Elbow Surg* 12(5): 484-90, 2003.
-