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Take home message

The telltale history, the exercise provocative test, and the instant relief manoeuvre are the diagnostic triad for this syndrome.

Late repair of simultaneous bilateral distal biceps brachii tendon avulsion with fascia lata graft

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Abstract

A 50 year old rock climber sustained a bilateral rupture of the distal biceps brachii tendons. He retained some flexion power in both arms but minimal supination, being weaker on the non-dominant right side. As the patient presented late, with retraction and shortening of the biceps muscle bellies, reconstruction was carried out using fascia lata grafts on both sides. Because of residual weakness on the left (dominant) side, three further surgical procedures had to be carried out to correct for elongation of the graft. A functionally satisfactory outcome, comparable with that on the right side, was eventually obtained. In summary, bilateral fascia lata grafts to bridge the gap between the retracted biceps bellies and the radial tuberosities were successful in restoring function and flexion power to the elbow. Despite being the stronger side, the dominant arm did not respond as well to the initial surgery. This may be due to overuse of this arm after the operation.

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Keywords: elbow; biceps brachii tendon; avulsion; fascia lata graft; tendon

Avulsion of the distal biceps brachii tendon is an uncommon injury,¹ and bilateral ruptures are extremely rare.² The incidence varies from 3 to 10% of all biceps tendon lesions,³ and usually occurs at the tendon insertion into the radial bicipital tuberosity.⁴

We present a case of an active male amateur climber with a late presentation of a simultaneous bilateral distal biceps brachii rupture. Several reconstructive procedures were required to repair the defect but a functionally acceptable outcome was finally achieved.

Case report

A 50 year old male amateur climber slipped while climbing on a rock face but held on with his fingertips while his elbows were forcefully extended against resistance. He felt a sudden give and extreme pain in both his arms

but still held on to the rock. He manoeuvred to a place of safety, and then found he was unable to straighten either arm because of pain and he carried both arms with the elbows flexed.

Rupture of the bicipital tendons was suspected and conservative treatment with analgesia was initiated. He found outdoor activities difficult and even his routine daily tasks were restricted because of weak elbow flexion. He was left hand dominant, but found his right arm weaker than the left, particularly when supinating.

The patient was referred to our clinic two years after the injury. Clinical examination confirmed that he had sustained a detachment of the insertion of both distal bicipital tendons, his right (non-dominant) arm being weaker than the left.

He underwent a right distal biceps tendon reconstruction, using fascia lata from his right thigh to bridge the defect between the retracted proximal biceps muscle and the distal bicipital tuberosity. After the operation, his right elbow was kept at 90° of flexion in a collar and cuff for two weeks; this was followed by gentle passive exercises to a maximum of 90° elbow extension for a further four weeks. He was advised not to do any heavy lifting or pulling with the arms for six months.

Six months later, the right biceps muscle was functioning and the tendon graft was palpable and pulling through with good power. At this stage he was keen to have a similar operation performed on the left side.

Eight months later, he underwent a similar operation with a fascia lata graft to the left distal biceps tendon. At review five months later, although clinically the distal insertion of the biceps tendon was intact, the result was less satisfactory than that on the right.

He admitted to overuse of the left arm after the operation compared with his right arm despite being given the same advice to avoid overstressing it. He underwent a revision of the reconstructed left biceps tendon and during surgery it was found that his bicipital tendon reconstruction was intact and a thick tendon

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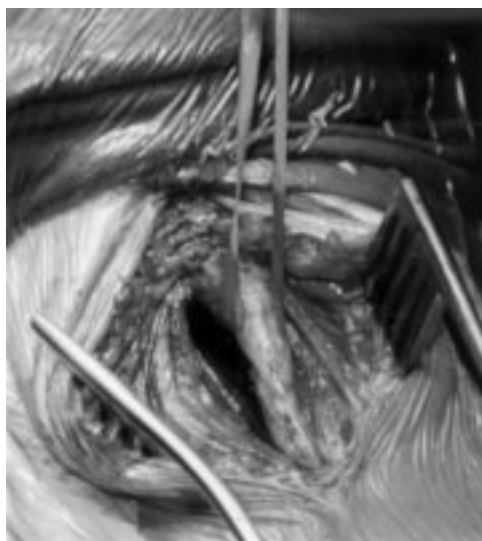


Figure 1 Reconstructed left biceps tendon six months after the operation, at the time of the first plication.

had formed; however, it was elongated and had to be plicated (fig 1).

Despite the revision of the left bicipital tendon, he was still unhappy with the result because of poor flexion and supination power. He continued to have a weak left arm particularly on elbow flexion. In November 1996 he had a further exploration of his left distal biceps, which revealed a thick tendon, which had formed from the graft, but the main (long head) belly of biceps was attached to the anterior elbow capsule and did not take part in elbow flexion. This was reconstructed by weaving the regenerated tendon into the muscle belly.

He initially had good functional improvement both for elbow flexion and supination, although over the next few months this result deteriorated. On palpation there was a loss of muscle mass at the distal insertion of the bicipital tendon. It was decided to explore for the fourth time in an attempt to improve function. Exploration of the muscle revealed an intact distal tendon with a rupture of the muscle belly at the junction of the middle and distal third of biceps. This defect was repaired with vicryl suture.

At a three month follow up examination, he had a good functional outcome with improved elbow flexion and supination. His subjective functional recovery since this operation has been satisfactory to date.

Discussion

Bilateral avulsion of the distal biceps brachii tendon is a rare injury.² It has been suggested⁵ that pre-existing degenerative changes in the biceps tendon or its insertion site can cause bicipital tendon rupture. Such ruptures have also been attributed³ to degeneration of the tendon secondary to spurs and forced rotation of the radius in relation to the ulna. Patients usually report a single traumatic event such as lifting a heavy load with flexed elbows or a sudden forceful extension of the flexed elbows, as in this case.

Initial management of this injury can be conservative. Non-operative treatment for rupture of the distal biceps tendon has been reported to be associated with no functional deficit,^{6,7} but others have shown a functional deficit in the biceps if it is left untreated.^{1,8} In addition, poor cosmesis may result, as the normal contour of the biceps muscle is permanently lost.⁹

Surgical repair is usually carried out for biceps injury in active individuals who require good supination for their sport, hobbies, or vocation and those who do not accept lack of cosmesis. Two main techniques have been proposed, one involving fixation of the tendon to the bicipital tuberosity,¹⁰ and the other reinsertion into the brachialis muscle.¹¹

Several studies^{1,12} have reported satisfactory results with the Boyd and Anderson¹⁰ two-incision technique in which the ruptured distal biceps tendon is reattached to the radial bicipital tuberosity using drill holes.¹² Patients showed a return to normal levels of power in both flexion and supination of the elbow.¹ Although this technique is currently the trend in managing this disabling condition, it relies upon a tendon of sufficient length to allow insertion into the radial tuberosity. Delayed presentation, proximal retraction, possible degenerative changes, and scarring to neighbouring structures make the original Boyd and Anderson¹⁰ technique difficult to perform. A new technique using Mitek anchors for reattachment of the biceps tendon to the radial tuberosity has been advocated.¹³

Operative treatment with reattachment of the biceps tendon to the brachialis tendon has produced a variable outcome.⁹ Fascia lata or plantaris longus tendons have been used as grafts for reconstruction of avulsed biceps tendon with good results.^{2,8}

One study using the Boyd and Anderson technique showed that patients with dominant injured extremities had full return of function, whereas in the non-dominant extremity, small deficits in supination and flexion power were noted.¹⁴ This study found subjective satisfaction with functional outcome in all their patients.

In this case, the non-dominant extremity had full return of function after the repair, whereas the dominant extremity required several attempts to produce a functionally satisfactory outcome.

In conclusion, the use of fascia lata graft to reconstruct the gap between a retracted biceps brachii muscle and the radial tuberosity proved to be successful in restoring function and flexion power to the biceps brachii muscle, particularly on the non-dominant arm. However, in this case a less satisfactory outcome with the dominant arm may have been caused by overuse of that arm in the period after the operation against medical advice, resulting in weakening and failure of the repair. The surgeon may have to warn physically active patients of the possibility of less favourable results if the advice to avoid oversteering the repair is not followed.

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Take home message

Bilateral rupture of the biceps brachii tendon is rare. It can be treated conservatively or surgically. In active individuals, operative management can be successful. This may require several reconstructive procedures especially if advice not to overstress the repair is not followed.

A rare fracture-dislocation of the hip in a gymnast and review of the literature

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Abstract

Posterior fracture-dislocation of the hip is an uncommon injury in athletics and leisure activities. It is more commonly seen in high energy motor vehicle accidents and occasionally in high energy sporting activities. A rare case is reported of posterior fracture-dislocation of the hip joint that occurred in a young athlete during gymnastics. This unusual mechanism of injury illustrates the great forces sustained by the hip joint of gymnasts. Early reduction and operative treatment led to a congruent and stable hip joint. After rehabilitation, she returned to light sporting activities after six months.

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Keywords: fracture-dislocation; hip; gymnast; operative treatment

Posterior fracture-dislocation of the hip is usually the result of high energy accidents. Most of the cases are associated with road traffic accidents when the knee strikes the dashboard and the femur is driven posteriorly into the acetabulum.¹ We present a rare case in which the injury occurred in a 13 year old female gymnast during a practice run up. This type of injury generated by this mechanism has not been reported previously. A review of the literature on fracture-dislocations of the hip joint in sports is also presented.

Case history

A 13 year old female gymnast presented to our accident and emergency department after an

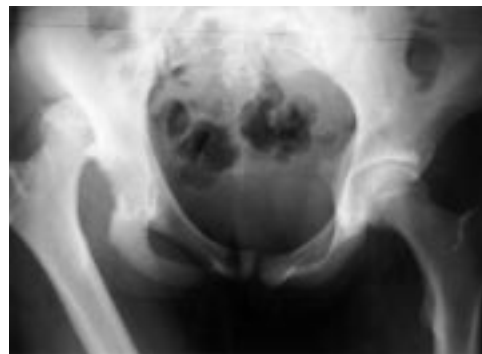


Figure 1 Posterior fracture-dislocation of the hip.

injury to her right hip at school during gymnastics. She had been performing gymnastics for about five years. She was 5 feet 6 inches tall and weighed 110 pounds. She reported that she was practising her run up before attempting a vault and landed one footed on a springboard left at an incline of 45° against the far side wall of the gymnasium. At the time of impact, the hip was flexed with a one foot impact. The hip was then adducted and internally rotated around the planted foot, resulting in sudden pain in the hip and an inability to bear any weight.

On examination, the right leg was found to be clinically dislocated posteriorly, the sciatic nerve was intact, and there was no evidence of vascular injury. Plain radiographs disclosed a posterior fracture-dislocation of the right hip (fig 1). There was no history in the family of any connective tissue disease or joint hypermobility. An urgent closed reduction under general anaesthesia was performed. Computed tomography scan illustrated a congruent re-

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