Distal biceps tendon ruptures account for approximately 3% of all biceps tendon ruptures. The two-incision repair techniques, as described by Boyd and Anderson in 1961, were developed to lower the risk of injury to the radial nerve and posterior interosseous nerve. Reports of posterior interosseous nerve palsy following this approach are rare. Transient posterior interosseous nerve palsies following a repair with the two-incision technique has been reported; however, permanent posterior interosseous nerve palsy following this procedure has not been reported previously.

Case Report

A 41-year-old, right-hand dominant man presented 4 weeks after injuring his left arm. He reported feeling a “pop” followed by pain in his left antecubital fossa while attempting to lift a pool table. Due to his size (350 lbs) and history of power weight lifting, examination of the left arm was difficult.

Magnetic resonance imaging confirmed a complete tear of the distal biceps tendon with proximal tendon retraction. The patient was advised of the risks and benefits of the surgical procedure, including potential radial nerve injury.

Distal biceps repair was performed 7 weeks postinjury. A modified two-incision technique was used. Because of retraction and scarring of the biceps tendon, the anterior dissection was difficult, and a tensor fascia lata graft was used to complete the repair. The radial nerve and posterior interosseous nerves were not dissected out, and were not identified during the procedure. Care was taken to protect the nerves by avoiding excessive traction, maintaining dissection on the bone when approaching the radius through the posterior lateral incision, and maintaining the forearm in supination when dissecting anteriorly and in pronation when dissecting in the posterior lateral incision. Reattachment of the tendon to the radial tuberosity was performed through a keyhole and drill holes using nonabsorbable sutures. The procedure was performed without obvious nerve injury or complication.

Postoperatively, the patient experienced posterior interosseous nerve palsy. Serial electromyograms (EMG) were obtained postoperatively. The most recent EMG performed 2.5 years postoperatively indicated active motor units in the extensor pollicis longus. However, the patient had not regained any active function, and the lesion was considered a permanent injury. Because the nerve was not exposed at repair, the mechanism of injury was due to traction, which caused an axonotemesis, which healed with a nonconductive intrafascicular neuroma.

Discussion

The Boyd-Anderson approach, first described in 1961, was later modified to a muscle splitting approach posterolaterally to lessen the incidence of radioulnar synostosis. Although the two-incision approach decreased nerve injuries associated with the one-incision technique, it did not eliminate them.

A single anterior incision using suture anchors has been developed to minimize dissection, lessening the risk of nerve injury and radioulnar synostosis. Various reports have documented temporary posterior interosseous nerve palsies following the two-incision procedure. In a review of
78 cases, Kelly et al2 reported a 6-month posterior interosseous nerve palsy. Moosmayer et al3 reported 2 temporary posterior interosseous nerve palsies in 9 distal biceps tendon ruptures repaired with a Boyd-Anderson technique.

The published reports of radial nerve and posterior interosseous nerve injuries following distal biceps repair using a two-incision approach are all of temporary palsies. To date, only one permanent sensory radial nerve palsy has been reported. Permanent posterior interosseous nerve palsy following this procedure has not been reported previously.

Acute repair of the radial nerve has proven efficacious (80%-90% recovery)5-7 due to large motor fascicular orientation. The results of acute direct repair of the posterior interosseous nerve are comparable.8 Factors that influence recovery from nerve injury include the patient’s age, length of defect, and interval to surgery.

The use of sural nerve grafts to bridge defects in the radial nerve have also shown satisfactory results9,10; however, time to recovery is longer in nerve grafting versus direct repair. The indication for using nerve graft is to secure repair without tension, but primary repair in a tension-free manner is always the goal. Nerve repair techniques are applicable only within 1 year from injury to reinnervate the motor endplates and provide motor function.8 Tendon transfers should be considered to restore function in chronic or missed nerve injuries.

REFERENCES