



Recurrent Bicep Strain Treated with Prolotherapy

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CASE DESCRIPTION

A 25-year-old male with no prior medical history presented with severe left distal bicep pain, worsening over the last 6 weeks. The pain had been reoccurring over the last 3 years, initially induced while participating in an arm-wrestling event. Pain had been exacerbated in the past by weightlifting, most recently 6 weeks prior to presentation after a series of power clean exercises. Pain was described as a burning sensation and was rated as 7 out of 10 on the Numeric Pain Rating Scale. He reported the pain was particularly worse with elbow flexion had only mildly improved with rest. He denied prior medications, injections, or other interventions for the bicep pain. Patient was an active power weightlifter and reported this pain had significantly affected his ability to progress with his powerlifting.

WORK UP & DIAGNOSIS

Physical exam was notable for tenderness to palpation at the left distal bicep muscle, with reproducible pain on resisted left elbow flexion with a supinated wrist. Otherwise, patient had intact passive and active range of motion throughout upper extremities without weakness, loss of sensation, or neurologic deficits. Point of care ultrasound imaging of the distal bicep was significant for diffuse areas of hyperechoic changes (Figure 1), most notable at the mid-belly of the bicep musculature. Radiograph imaging of the left humerus showed no evidence of acute displaced fracture or bone destruction of the humerus shaft. Patient was diagnosed with a distal bicep strain.

TREATMENT

Due to the prolonged and repetitive nature of injury with previous conservative management with rest and physical therapies, patient opted for a trial of prolotherapy. A solution of dextrose prolotherapy consisting of 2 cc 1% lidocaine, 2 cc saline, and 2 cc 50% dextrose was prepared. Approximately 0.5 cc of the solution was injected at multiple areas within the hyperechoic regions in the left distal bicep musculature under ultrasound guidance (Figure 1). A repeated injection of the same solution was performed 1 month later. Patient was given precautions to refrain from NSAIDs, weightlifting, and exacerbating bicep workouts during this time frame.

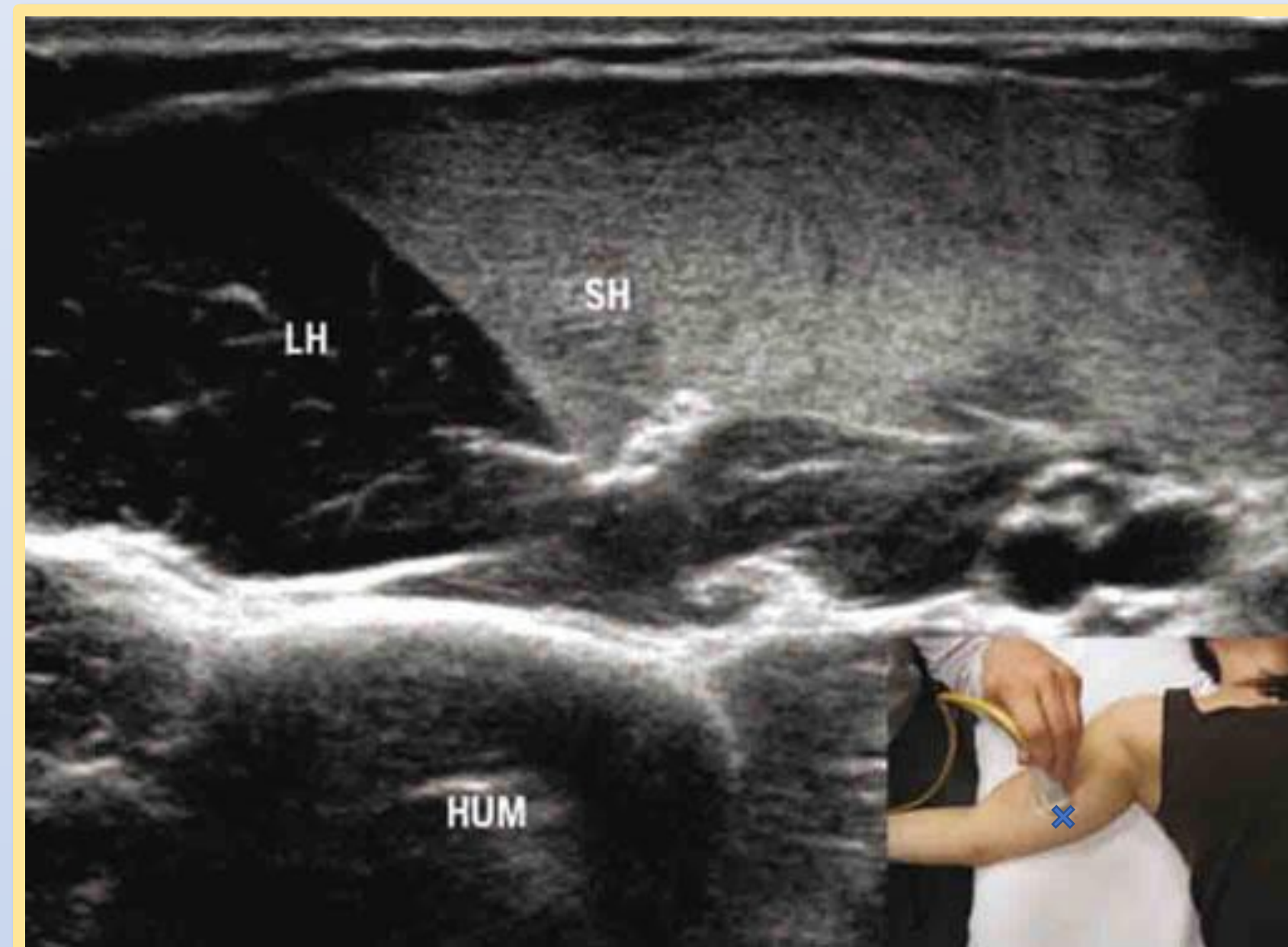


Figure 1. Short axis ultrasound image of the right biceps brachii. Note the high echogenicity of the short head biceps brachii (SH), an indication of muscle strain resulting in significant edema, compared to the uniform low echogenicity of the long head biceps brachii (LH).

X marks the location of the prolotherapy injection in a presumed patient, in plane with the ultrasound probe.

Image taken from:
J Orthop Sports Phys Ther 2012;42(6):569. doi:10.2519/jospt.2012.0411

At a 6 month follow up, the patient had subjectively reported complete resolution of his left bicep pain. He had no reproducible pain or tenderness to palpation on examination. Point of care ultrasound imaging of the distal bicep musculature also revealed a normal fiber pattern. He was also able to eventually make a return to powerlifting at 100 percent capacity, with even a notable increase in subjective strength.

DISCUSSION

Prolotherapy is a relatively safe injection of inflammatory promoting agents typically performed in joints, ligaments, and tendons to promote repair and functional restoration^{1,2}. Solutions of prolotherapy (e.g., hypertonic dextrose) is theorized to induce an inflammatory healing cascade to increase fibroblast proliferation and subsequent collagen synthesis, which ultimately promotes regeneration and repair of injured tissues³.

In a study that evaluated the effects of dextrose prolotherapy on contusion muscle injuries in mice⁴, there was an observed increase in desmin protein expression and muscle satellite cell regeneration, which may be crucial for the muscle repair process. In clinical practice, there has been a lack of documented reports of prolotherapy for bicep muscle strain. Here we explored prolotherapy's application as an adjunct treatment for bicep strain, which previously consisted of conservative treatments including anti-inflammatory medications, RICE, and muscle stretching/strengthening. In addition, we used an intramuscular approach over the area of strain that differs from the usual tendon and entheses target. Our patient subsequently experienced complete pain resolution and full return of functional outcome following this intramuscular prolotherapy approach.

CONCLUSION

Prolotherapy injections of the bicep brachii can be considered an adjunct to standard conservative management of recurrent strains that results in improvement of pain scores and functional outcome.

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