Posterior Arm and Deltoid Compartment Syndrome After Vitamin B12 Injection

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Posterior arm compartment syndrome is an infrequently reported. The literature typically reports sustained muscular compression or a bleeding diathesis as the causes.

This article presents a patient who developed posterior arm compartment syndrome following a vitamin B12 injection.

CASE REPORT

A 67-year-old man presented with progressive and intense upper right arm pain associated with paresthesias in the forearm and fingers and increased with elbow flexion and extension.

Medical history revealed pernicious anemia related to prior subtotal gastrectomy for peptic ulcer disease. An anastamotic ulcer was noted, following a Roux-en-Y biliary diversion secondary to persistent bilious vomiting. As a result, long-term iron and vitamin B12 supplementation was required. No other significant medical problems were noted and the patient was not on any anticoagulants.

Six days prior to presentation, the patient received a B12 injection over the left deltoid region. Over the subsequent days he reported increasing pain and swelling. Twelve hours prior to presentation, he reported sharply increasing pain in the arm, and weakness and paresthesias in the fingers.

On examination, gross swelling was noted over the upper aspect of the lateral and posterior arm centered around the injection site. The area was tense and tender over the posterior and deltoid compartments. The flexor compartment was soft and nontender. The ulnar two digits and the extensor surface of the forearm and dorsal hand were numb. Instrinsics strength was 4/5 and wrist and finger extensor strength was 3/5. Elbow flexion increased the pain out of proportion to other physical findings. The radial pulse was strong and symmetric to the opposite side. The fingers had symmetric brisk capillary refill.

Diagnosing an arm compartment syndrome can be difficult and, perhaps due to its infrequent occurrence, is often delayed.

Using a Stryker compartmental pressure monitor (Stryker Howmedica Osteonics, Kalamazoo, Mich), the flexor compartment measured 20 mm Hg and the extensor compartment 56 mm Hg.

Urgent decompression of the posterior arm compartment was performed. A posterolateral incision was made to release the posterior compartment. A large hematoma was evacuated. No frank active bleeding was found. A small amount of necrotic muscle was debrided from the lateral triceps. The deltoid compartment was relatively tense so the incision was extended to allow release of the deltoid fascia. A small hematoma was found, but no frank necrotic muscle was noted. The wound was packed open.

Postoperatively, pain decreased immediately. The patient underwent re-exploration due to persistent bleeding. No pulsatile bleeding was noted, but several venous bleeders were cauterized. Primary wound closure was performed after swelling had diminished. The patient was discharged with no residual paresthesias or weakness.

DISCUSSION

Compartment syndrome of the arm is infrequently described in the literature, and no cases report injection as the etiology. The reason for the paucity of compartment syndrome in the arm has been attributed to the relatively thin fascia of the arm compared to that of the forearm or leg.[1] This thin fascia expands more easily than fascia in other areas to accommodate the increasing volume or pressure within the compartment.

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Diagnosing an arm compartment syndrome can be difficult and, perhaps due to its infrequent occurrence, is often delayed. A classic sign of compartment syndrome includes pain out of proportion to other findings that is not responsive to typical pain medications. Other classic signs include a tense and swollen compartment, pain with passive stretching of the muscles in the involved compartment, and paresthesias or distal muscle weakness in nerves traversing the involved compartment. Diminution of arterial pulses traversing the involved compartment is a late finding. Posterior arm compartment syndrome is heralded by a swollen, tense compartment and pain with elbow range of motion. As the compartment syndrome progresses, paresthesias in the distribution of the radial and median nerves occur as well as motor dysfunction.

Etiologies cited in the literature vary. These injuries commonly result from a crush injury.[2,3] Diminick et al[4] reported bodybuilders' predisposition to compartment syndrome after crush injuries. In this case, hypertrophied muscle diminishes available room for compartment expansion. Compartment swelling also occurs from long periods of muscular compression.

Another common contributor to arm compartment syndrome is bleeding diatheses. Hemophiliacs are more likely to develop compartment syndrome from a hemorrhage.[5] Hemophilia has also been diagnosed after compartment syndrome in the hand.[6] Compartment syndrome of the arm has been described after thrombolytic therapy in an individual who sustained a myocardial infarction.[7] The patient fell during his heart attack and presumably sustained contusion to his arm. Compartment syndrome occurred in a patient on anticoagulation therapy after sustaining a biceps tendon rupture.[8] It also has been diagnosed after humeral shaft fractures.[9]

Posterior arm compartment syndrome is heralded by a swollen, tense compartment and pain with elbow range of motion.

This case represents a novel cause of compartment syndrome of the arm; hemorrhage after vitamin B12 injection. Although individuals needing vitamin B12 supplementation frequently can be treated with oral supplementation, individuals with poor absorption require parenteral administration.[10]

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