Recurrent Intramuscular Hematomas in a 40-Year-Old Female Renal Transplant Recipient

Heidi Chen, MD1, Xiaoning Yuan, MD, PhD2, Asad R. Siddiqi, DO3,
Akinpelumi Beckley, MD, MBA4

1NewYork-Presbyterian Hospital, New York, NY
2Uniformed Services University of the Health Sciences, Bethesda, MD
3Weill Cornell Medicine, New York, NY
4Columbia University Irving Medical Center, New York, NY

Correspondence:
Heidi Chen
Department of Physical Medicine & Rehabilitation
Harkness Pavilion 1st Floor Rm. 168
180 Fort Washington Avenue
New York, New York 10032
Phone: 6469571377
Email: hec9065@nyp.org
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A 40-year-old woman with lupus with anticoagulant positivity and end-stage renal disease status post right-sided kidney transplantation complicated by retroperitoneal hematoma and lumbar plexopathy presented with recurrent right medial thigh intramuscular (IM) hematomas. The first IM hematoma occurred one year post-transplant following leisurely horseback riding. Her examination was significant for ecchymosis from the right pubis to the medial mid-thigh, 4/5 pain-limited hip flexion and adduction strength, 5/5 knee flexion and extension strength, with intact sensation and reflexes throughout. Ultrasound (US) revealed an IM adductor longus hematoma measuring 6.3 × 12.9 × 2.2 cm (Figure 1). Computed tomography of the right lower extremity excluded other pathology such as sarcoma. She was managed conservatively with acetaminophen for pain and continued her home exercise program focusing on lumbopelvic, gluteal, hip flexor and adductor strengthening. US-guided aspiration was offered for persistent or worsening symptoms. However, the hematoma self-resolved in two months.

A year later, she returned with right medial thigh pain, swelling, and bruising after performing adductor stretching at home. Her examination was significant for right medial thigh ecchymosis with 5/5 strength and preserved reflexes and sensation throughout. High-resolution diagnostic US of the lower abdomen and medial thigh was notable for an IM gracilis hematoma measuring 3.5 × 16.6 × 1.6 cm (Figure 2A). Side-to-side comparison revealed hyperechoic, atrophic appearance of the right gracilis, adductor magnus (Figure 2B), and internal oblique (Figure 2C) muscles and subtle echogenic changes with decreased bulk of the right adductor longus and brevis muscles (Figure 2D) compared to the left. These right-sided findings were possible sequelae of fibrous scarring following severe, recurrent muscle injury and/or lumbar plexopathy diagnosed two years prior. The right iliohypogastric, iliouinguinal, and obturator nerves, as well as the iliacus and
quadriceps muscles appeared normal. Her second hematoma self-resolved in four weeks with no residual functional deficits.

**Teaching Points**

1. Normal muscles have a characteristic "starry night" appearance on US with hypoechoic muscle fibers arranged in fascicles, interspersed with hyperechoic perimysium\(^1,2\). After denervation changes, muscle tissue appears grossly hyperechoic due to atrophy and loss of hypoechoic muscle fibers\(^1\).
2. Following severe or recurrent muscle injury, fibrous scars may form, appearing as focal, hyperechoic linear or stellate lesions, while the majority of surrounding muscle tissue appears normal in echotexture\(^3\).
3. US appearance of IM hematomas vary with age. Acute IM hematomas appear hyperechoic due to transient muscular edema, while subacute IM hematomas appear hypoechoic or heterogeneous with mixed echogenicity\(^1,2\).

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References


Figure 1. Ultrasound imaging of right adductor longus hematoma. (A) Longitudinal, expanded field-of-view image of a heterogeneous mass (*asterisk*) with multiple hyperechoic internal septations within the right adductor longus (*AL*), measuring 6.3 (width, not pictured) × 12.9 (length) × 2.2 (depth) cm, consistent with an intramuscular hematoma of the right AL. Layers from superficial to deep: skin and subcutaneous tissue (*SQ*), adductor longus and intramuscular hematoma, adductor magnus (*AM*). (B) Transverse image of an intramuscular hematoma (*asterisk*) of the right adductor longus with color (*CD*) and pulsed wave (*PWD*) Doppler, demonstrating pulsatile, arterial flow within the hematoma. Images obtained by radiology with a GE Logiq E9 ultrasound machine.

Figure 2. Ultrasound imaging of the lower abdomen and medial thigh. (A) Longitudinal, expanded field-of-view image of a complex mass (*asterisk*) with hyperechoic internal septations within the right gracilis (*G*), measuring 3.5 (width, not pictured) × 16.6 (length) × 1.6 (depth) cm, consistent with an intramuscular hematoma of the right gracilis. Layers from superficial to deep: skin and subcutaneous tissue (*SQ*), gracilis and intramuscular hematoma, adductor magnus (*AM*; proximal) and vastus medialis (*VM*; distal). (B) Transverse side-to-side comparison views of the bilateral gracilis (*G*) and adductor magnus (*AM*) muscles. Note the hyperechoic changes and loss of muscle fiber architecture of the right gracilis and the superficial portion of the right adductor magnus. (C) Transverse side-to-side comparison views of the bilateral lower abdomen. Note the hyperechoic appearance with decreased bulk of the right internal oblique (*IO*; dashed outline), and the hypertrophy and increased bulk of the right external oblique (*EO*). (D) Transverse side-to-side comparison views of the bilateral medial thighs. Note the more subtle hyperechoic changes of adductor brevis (*AB*) and adductor longus (*AL*) that arise from loss of some hypoechoic muscle.
fibers with increased density of hyperechoic connective tissue (dashed outline), which result in a small decrease in overall muscle bulk compared to the contralateral side. Images obtained by the authors with a GE Logiq S8 ultrasound machine and 3-12 MHz linear transducer. Abd: abdominal contents. TrA: transversus abdominis.
Figure 1