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BACTEREMIA AND DEEP VEIN THROMBOSIS IN AN INFANT

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☐ **Abstract—Background: Deep vein thrombosis (DVT) is rare in infancy. In pediatric populations, thrombosis occurs most frequently in hospitalized children and those with central venous catheters. The presence of a DVT in the general pediatric population indicates a hypercoagulable state and requires rapid diagnosis and treatment of both the thrombosis and the underlying process. Case Report: A previously healthy 6-month-old male was brought to the emergency department by his family with a chief complaint of left leg swelling. Duplex ultrasonography in the emergency department revealed multiple DVTs in the leg vasculature. The patient was treated with anticoagulation and antibiotic therapy in the emergency department and admitted. Blood cultures revealed the subsequent growth of methicillin-resistant *Staphylococcus aureus* (MRSA). Why Should an Emergency Physician Be Aware of This?: While rare in infants, new-onset swelling in an extremity may be caused by thrombosis and be the initial symptom of an underlying hypercoagulable state. Duplex ultrasonography is a relatively benign test that can be readily performed in most emergency departments, and it allows physicians to rule out thrombosis. When present, DVT in the general pediatric population can indicate a critical illness, such as malignancy or infection, and requires rapid treatment and admission to a pediatric service for management. © 2016 Elsevier Inc.**

☐ **Keywords—bacteremia; DVT; MRSA; pediatrics**

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INTRODUCTION

Thrombosis is rare in infancy and threatens life and limb. The presence of deep vein thrombosis (DVT) in an infant indicates a hypercoagulable state. Several etiologies exist in this age group, including genetic, malignant, traumatic, anatomic, iatrogenic, and infective processes (1–3). Prospective epidemiologic studies have shown an incidence of 0.07 and 0.14 per 10,000 children in the general population (2,3). The most common associated conditions include malignancy, infection, and congenital cardiac disease. Children that are hospitalized and those with central venous lines are at especially high-risk for DVT (2,3).

Because of limitations in a patient's clinical history, the diagnosis of thrombosis in infants is dependent on clinical suspicion. Ultrasonography is the modality of choice for infants suspected of thrombosis.

CASE REPORT

A previously healthy 6-month-old male presented to the emergency department (ED) with a chief complaint of left leg swelling. The patient's family stated that they had first noticed the swelling that morning, upon awakening. It was noteworthy that the patient had presented to the ED 1 day earlier with a complaint of intermittent fever for the previous 6 days. During this visit, the patient presented with a rectal temperature

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of 104.2°F, a heart rate of 143 beats/min, a systolic blood pressure of 126 mm Hg, a diastolic blood pressure of 81 mm Hg, a respiratory rate of 36 breaths/min, and an oxygen saturation of 100% on room air. The history of the presenting illness featured no focal infection; the physical examination revealed warm, dry, and intact skin and no reported rash, lesions, or swelling. The patient was given an oral dose of ibuprofen in a 10 mg/kg suspension and observed for 2 hours. Reassessment showed the patient to be well-appearing and playful with family. Discharge vital signs showed a rectal temperature of 100.4°F, a heart rate of 149 beats/min, a systolic blood pressure of 94 mm Hg, a diastolic blood pressure of 68 mm Hg, a respiration rate of 40 breaths/min, and oxygen saturation of 99% on room air. The patient was diagnosed with viral syndrome and discharged home with instructions to follow-up with their primary care provider the next morning.

On the patient's return visit to the ED, his initial vital signs showed a rectal temperature of 99.2°F, a heart rate of 180 beats/min, a systolic blood pressure of 107 mm Hg, a diastolic blood pressure of 71 mm Hg, a respiratory rate of 36 breaths/min, and oxygen saturation of 100% on room air. The physical examination revealed a tender, mildly swollen left leg with erythema extending from hip to ankle (Figure 1). The skin appeared intact with no visible lesions or portals of entry. Neither strength nor range of motion appeared to be affected. The family reported no known trauma or skin abnormalities. Dorsalis pedis pulses were equal and regular. A family history revealed a sibling with sickle cell anemia but noted a negative hematology workup for the patient at birth.

The differential diagnosis was nonaccidental trauma, cellulitis, and abscess. Initial laboratory findings showed a white blood cell count of 17.3 (normal, 6.0–17.5 1000/μL) with a prominent left shift bandemia of 40% (1–5% manual differential) (Table 1). Additional testing revealed an elevated D-dimer level (3.45; normal, 0.00–0.49 μg/mL FEU), an elevated erythrocyte sedimentation rate (90; normal, 0–25 mm/h), and an elevated C-reactive protein level (155; normal, 0.2–155.0 mg/L). Hemostasis studies showed a prothrombin time of 17.9 seconds (normal, 11.5–15.3 seconds), an International Normalized Ratio of 1.48, and a partial thromboplastin time of 29 seconds (normal, 23–39 seconds). A complete metabolic panel and homocysteine and lactic acid levels were unremarkable. Radiographic studies revealed soft tissue swelling with no osteopathic changes. Duplex ultrasonography in the ED found both compression defect and flow changes in the left distal femoral, popliteal, and greater saphenous veins, consistent with deep vein thrombosis (DVT) (Figure 2). The proximal and mid-femoral veins showed no defects. These findings were consistent with multiple, separate clots occupying the vasculature. Based on this imaging study, it was clear that the patient had an occlusive lesion in both the greater saphenous vein and an additional, separate lesion extending from the distal femoral vein to the popliteal vein. It is not known whether these lesions formed independently or started as the same thrombus. Consultation with hematology service was made, and the patient was started on enoxaparin 1.5 mg/kg subcutaneously and treated prophylactically for infection with ceftriaxone 50 mg/kg, clindamyacin 10 mg/kg, and vancomycin 17.5 mg/kg intravenously. The patient was admitted to the pediatric intensive care unit.

On day 1 of the hospital stay, blood cultures showed positive growth at 14 hours for methicillin-resistant *Staphylococcus aureus* (MRSA). A magnetic

Table 1. Complete Blood Cell Count and Manual Differential at Time of Emergency Department visit

Parameter (Normal Range)	Value
White blood cell count (6.0–17.5 1000/μL)	17.3
Red blood cell count (3.70–5.00 mg/μL)	4.16
Hemoglobin (11.5–13.5 g/dL)	9.1
Hematocrit (34.0–40.0 %)	27.1
Mean corpuscular volume (70–86 fl)	65
Mean corpuscular hemoglobin concentration (30.0–36.0 gm/dL)	33.5
Red cell distribution width (12.1–14.9 %)	16.7
Platelets (150–375 1000/μL)	385
Mean platelet volume (6.5–12.0 fl)	10.4
Neutrophils (20–40%)	44
Bands (1–5%)	41
Lymphocytes (44–74%)	8
Monocytes (1–5%)	5
Eosinophils (0–3%)	0
Basophils (0–2%)	0
Metamyelocytes (0–0%)	2

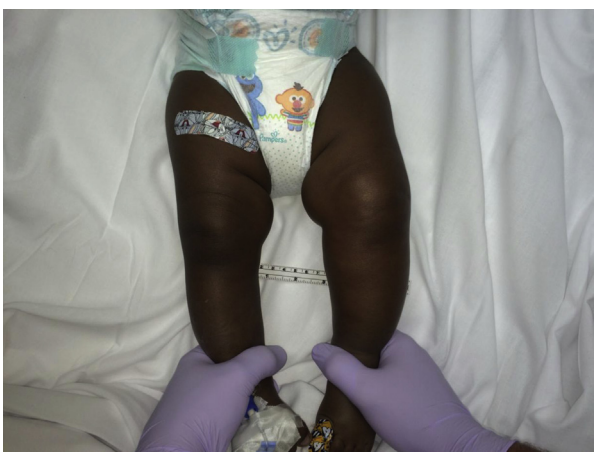

Figure 1. Left leg venous thromboses. Subtle changes appreciable by family and clinicians.