Lemierre’s Syndrome Caused by MRSA Infection in an Infant

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Objective:
1. Describe an infant with Lemierre’s Syndrome caused by MRSA Septicemia
2. Discuss treatment options and management of LV Thrombosis and Lemierre’s Syndrome in Children

Methods:
Lemierre’s Syndrome is usually characterized by recent oropharyngeal infection complicated by internal jugular vein thrombosis. The main pathogen is usually Fusobacterium necrophorum. The vast majority of patients affected are young adults. We present a case of community acquired Methicillin-resistant Staphylococcus aureus (MRSA) in an eight week old male who was being breastfed by his mother, who was a MRSA carrier. He presented with a two day history of fever and left neck swelling and was found to have a deep neck abscess extending into the mediastinum with internal jugular thrombosis extending retrograde to involve the sigmoid sinus.

Results:
The infant was taken to the operating room multiple times for incision and drainage procedures. The internal jugular vein was not ligated; however, he was treated with anticoagulation with demonstration of recannulation of the sigmoid sinus. The patient was treated with long term IV antibiotics. In addition, his mother was treated with Chlorhexidine baths for MRSA decolonization.

Conclusion:
Classically described in older patients with Fusobacterium infections, there is a growing body of literature reporting Lemierre’s syndrome secondary to MRSA infections, particularly in a younger patient population suggesting a changing demographic as well as a changing microbial pattern. We present the youngest case of Lemierre’s Syndrome secondary to community acquired MRSA.

Introduction
Lemierre’s syndrome (LS) is characterized by septic thrombophlebitis of the internal jugular vein after an oropharyngeal infection. Septic emboli can subsequently develop and, in the preantibiotic era, fatality ensued within a few weeks of onset. This entity was first described as “post anginal sepsis” in 1900 by Courmont and Cade but gained it’s moniker after Andre Lemierre’s extensive description in 1936.1 It was initially described as the development of septic thrombophlebitis of the tonsillar and peritonsillar veins followed by involvement of the parapharyngeal space and internal jugular vein caused by Bacillus funduliformis (now known as Fusobacterium necrophorum).2 While Lemierre’s syndrome was a frequent complication of deep neck infections in the preantibiotic era, there was a steady decline in the incidence after the advent of antibiotics and it became known as the “forgotten disease.”3,4 Today, the incidence is estimated at between 0.6 and 2.3 million.5 However, over the past two decades, there has been an increase in the number of cases of Lemierre’s being reported in the literature. Lemierre’s is typically associated with anerobic infections in otherwise healthy young adults.6

We present a rare case of Methicillin-resistant Staphylococcus aureus (MRSA) associated Lemierre’s in an eight week old male.

Case Presentation
An eight week old male infant presented to an outside hospital with a two day history of fever and left neck swelling. He was started on beta-lactamase stable antibiotics for twenty four hours but was transferred to our hospital after failing to improve. Prenatal and medical history was only significant for being breastfed by his mother who was a MRSA carrier. At presentation to our hospital, the patient was noted to be very irritable with left sided neck swelling and erythema, T 38.5 (up to 102.3 F), leukocytosis (white blood count 25) and decreased urine output. However, the patient was hemodynamically stable with no evidence of airway instability. A Computed tomography (CT) Scan of the neck with IV contrast was obtained and demonstrated a low attenuation fluid collection involving the retropharyngeal space and a rim enhancing abscess of the left parapharyngeal space. The patient was taken emergently to the operating room on Hospital Day #1 for incision and drainage of the left deep neck abscess. Approximately 5ml of frank pus was drained from the posterior pharyngeal space and left internal jugular vein thrombosis was identified. A paroencephalocle was left in place and the patient was transferred to the Pediatric Intensive Care Unit in critical condition. Given the patient’s maternal history of multiple MRSA infections, the infant was empirically started on Vancomycin and Clindamycin.

The patient improved slightly but had persistent purulent drainage through the peroneum drain and remained febrile. Repeat magnetic resonance imaging was ordered to evaluate whether the fluid collections were adequately being drained by the peroneum drain however the drain developed worsening cellulitis with progression to the contralateral side. The patient became hemodynamically unstable in the MRI suite with evidence of septic shock. He was taken back to the intensive care unit where he was stabilized. Repeat CT imaging was obtained the following day when the patient was hemodynamically stable. Repeat imaging demonstrated some progression of the fluid collections surrounding the left carotid sheath, peripheral rim enhancement surrounding the thymus and anterior mediastinum as well as progression of the left internal jugular thrombosis into the chest and retrograde to involve the sigmoid sinus. The patient was taken back to the Operating Room on Hospital Day #4 for neck re-exporation and drainage of the retropharyngeal abscess as well as drainage of mediastinal abscess by Pediatric Surgery. Multiple passive drains were placed in the wound and patient was monitored closely postoperatively. The internal jugular vein was not ligated as the thrombus extended beyond the neck. Instead, the patient was started on a heparin drip after his second operative trip and transitioned to Enoxaparin (1mg/kg per dose subcutaneously every 12hours). Repeat imaging demonstrated recannulation and complete resolution of the transverse and sigmoid sinus blood thrombi. Wound cultures were consistent with MRSA.

The patient was treated with IV antibiotics (Vancomycin and Rifampin) for a total of 15 days. He was discharged home on Bachtrim for two additional weeks and left the hospitable in stable condition without any long term sequelae. The family and his patient were also treated with daily chlorhexidine baths.

Discussion
Lemierre’s syndrome typically occurs in otherwise healthy adults secondary to an oropharyngeal infection. Internal jugular vein septic thrombosis develops and septic emboli can lead to pulmonary and joint involvement.1-4 LS is typically associated with anaerobic organisms: Fusobacterium necrophorum (57%), Fusobacterium species (39%) and Fusobacterium nucleatum (3%) followed by anaerobic streptococci and other miscellaneous Gram negative anaerobes.5-6 Staphylococcus aureus is not usually a cause of Lemierre’s syndrome.

Classically described in older patients with Fusobacterium infections, there is a growing body of literature reporting Lemierre’s syndrome secondary to MRSA infections, particularly in a younger patient population suggesting a changing demographic as well as a changing microbial pattern.1,2,6 Since 2002, there have been 13 cases of septic internal jugular thrombophlebitis secondary to staphylococcal aureus unrelated to catheter placement reported in the literature.3-7 No reports were identified in the preceding 20 years. Nine of these cases were caused by methicillin resistant staph aureus.5,6,7 Five of these cases occurred in pediatric patients (age range 3 months to 16yrs), and three of these pts were less than one year of age.8-11 The clinical presentation varied among the patients. Most presented with facial or neck swelling and fever. All three children under 12 months of age, presented with rapid onset neck swelling, fever and deep neck abscess formation.5,6,8 All three of these patients underwent incision and drainage and prolonged treatment with IV antibiotics and did well.5,6,8-11

Staphylococcus aureus is the most commonly isolated human bacterial pathogen,6,20-21 Methicillin-resistant Staphylococcus aureus (MRSA) is increasingly prevalent in the United States. There has been a dramatic increase in the number of both hospital acquired and community acquired MRSA infections.3,9,10 MRSA related Lemierre’s Syndrome appears to be more prevalent and affecting a younger population of patients.12 Early diagnosis with aggressive antimicrobial therapy and surgical intervention is key to effective treatment of Lemierre syndrome and prevention of septic emboli.

Internal jugular vein thrombophlebitis usually manifests as unilateral swelling and pain at the angle of the mandible and along the sternocleidomastoid muscle with associated trismus. Although rare, Lemierre syndrome has the potential for significant morbidity and possibly mortality. Early recognition and aggressive treatment are important in preventing severe systemic manifestations. We recommend CT scan imaging with IV contrast or ultrasound imaging for diagnosis. Empiric broad spectrum antibiotics should be started as soon as possible. MRSA should be considered in all patients not responding to beta lactamase stable conventional antibiotic therapy. While the effectiveness of anticoagulation is still unclear, anticoagulation to prevent progression of thrombus or development of septic emboli may be considered in the treatment algorithm of Lemierre’s Syndrome depending on individual patient cases and physician preferences rather than firm evidence.

Conclusions
Lemierre’s syndrome is a rare but potentially life threatening infection which is on the rise today, with a changing demographic as well as a changing microbial pattern. Without awareness of MRSA as a causative agent, appropriate antibiotic coverage may be delayed. Early diagnosis and intervention is essential. We present the youngest cases of Lemierre’s Syndrome secondary to community acquired MRSA.

Table 1. Cases of Staphylococcus aureus related Lemierre’s Syndrome. MRSA= methicillin resistant Staphylococcus aureus ; MSSA= methicillin sensitive Staphylococcus aureus

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References