**Introduction:** Cervical lymphadenitis may have multiple etiologic factors and can pose a diagnostic dilemma for pediatric hospitalists. This case and review of the literature explores various causes, diagnostic methods, and treatment options available to the pediatrician caring for children with lymphadenitis.

**Case:** An 18-month-old male infant originally presented with swelling in the right neck near the angle of the jaw which gradually developed over 4 to 5 days. He was first taken to his primary care provider who noted multiple enlarged, nontender, submandibular lymph nodes and prescribed amoxicillin. However, because of increasing swelling after several days of antibiotic use, the patient was taken to the emergency department where he was prescribed, and completed, first a 10-day course of amoxicillin/clavulanate, and subsequently, a 7-day course of azithromycin. The patient’s neck swelling failed to improve, though he never developed significant fever or prominent tenderness.

**Question:** Is the patient’s clinical course up to this point suggestive of typical bacterial lymphadenitis, with treatment failure or is it suggestive of something less typical?

**Discussion:** Cervical lymphadenopathy is common in children and is usually caused by transient reactive hyperplasia from an acute viral illness. In acute bacterial cervical lymphadenitis, the presentation is usually unilateral lymphadenopathy with signs of inflammation, often accompanied by fever and pain at the site of infection, which this patient did not have. The pathogens most commonly found in acute bacterial lymphadenitis are *Staphylococcus aureus* and *Streptococcus pyogenes*. Recent literature reports that *S aureus*, in particular community-acquired methicillin-resistant *S aureus* (CA-MRSA), is increasingly common. A 2007 review of 62 patients undergoing surgical drainage for acute cervical lymphadenitis showed that of 49 culture-positive cases, 36% yielded methicillin-sensitive *S aureus* (MSSA), 27% yielded methicillin-resistant *S aureus* (MRSA), and 22% yielded group A beta-hemolytic streptococci (GABHS). However, rates of culture positivity for CA-MRSA in surgical specimens have been found to be as high as 40% to 60%. While in the outpatient setting, reasonable initial antibiotic choices available to the primary care physician could include cephalexin, amoxicillin/clavulanate, or clindamycin, for the pediatric hospitalist treating suspected bacterial lymphadenitis, initial therapy should include CA-MRSA treatment that is based on local resistance patterns. However, given that this patient did not have fever or pain, and has persistent lymphadenopathy, his course is suggestive of an alternative cause.

**Case Continued:** This patient’s medical history was unremarkable. His family history was negative for chronic infections. The family denied recent travel or pet exposure, and the patient lived in an urban area with limited outdoor exposure. Of note, his
father had recently been incarcerated, but he denied any symptoms of cough, fever, or weight loss. Because of his failure to improve after two courses of antibiotics, he was referred to an otolaryngologist who prescribed oral clindamycin. However, 3 days later, the patient returned to the emergency department with fever and a change in the character of his neck swelling from firm and non-tender to a fluctuant, warm mass with overlying erythema (Figure 1). He was admitted to the hospital where he underwent ultrasonography of the neck, which revealed right submandibular lymph nodes with air/fluid levels suggestive of suppurative lymphadenitis.

**Question:** Was clindamycin an appropriate choice at the otolaryngology visit? How does treatment proceed now that the child is admitted?

**Discussion:** The patient has failed outpatient therapy with amoxicillin/clavulanate, which can be used for treating MSSA and GABHS lymphadenitis. At this point, treatment of CA-MRSA lymphadenitis is indicated. Clindamycin can be used for initial treatment of CA-MRSA skin and soft tissue infections, but use of an alternative agent is recommended when local resistance patterns are greater than 10%. Other reasonable treatment regimens could include cotrimoxazole. Both linezolid and vancomycin should be considered in patients suspected of having CA-MRSA and significant illness symptoms. Given the persistence of lymphadenopathy for several weeks and the now suppurative character of the nodes on ultrasonography, we should also consider surgical drainage.

**Case Denouement:** The patient underwent incision and drainage of the lymph nodes. Laboratory testing for *Bartonella henselae*, *Toxoplasma gondii*, and blood cultures were negative. A purified protein derivative test at admission found 5 mm of induration, and a culture specimen from the incision and drainage yielded acid-fast bacilli (AFB), which was later identified as *Mycobacterium avium* complex. The patient began a 4-month regimen of ethambutal, clarithromycin, and rifampin with healing of the area but with residual scarring.

**Discussion:** Subacute infectious cervical lymphadenitis occurs over the course of 2 to 4 weeks or more and a very different set of pathogens are usually considered (Table 1). Common agents in the United States include nontuberculous mycobacteria, cat-scratch disease (*B. henselae*), and rarely, opportunistic fungal and parasitic infections, including *T. gondii* infection. Unlike acute bacterial lymphadenitis, these infections less frequently suppurate and are more often associated with diffuse lymphadenopathy.

In subacute infections, serologic testing for *B. henselae*, cytomegalovirus, Epstein-Barr virus, and human immunodeficiency virus should be considered as well as skin tuberculin testing, which can be positive in both *M. tuberculosis* as well as nontuberculous mycobacteria (NTM) infection. Ultrasonography has proven to be an effective modality to facilitate diagnosis and track clinical improvement in cases of nonsurgical management. In cases in which therapy is not effective, biopsy, fine-needle aspiration, or excision is warranted. For any surgical specimens, testing should include cultures for bacteria, fungi, and AFB as well as Gram and tissue staining for fungi, *B. henselae* (Warthin–Starry stain), and AFB.

For NTM, excisional biopsy may be both diagnostic and curative, but the surgery carries some risk of nerve damage. However, many providers prefer surgical excision over incision and drainage of lymph nodes infected with NTM, likely because of risks of chronic draining fistulas and poor cosmetic outcome associated with incomplete removal of infected tissue. Antibiotic treatment of NTM most frequently involves a macrolide plus adjunctive agents such as...
TABLE 1 Common Infectious Causes of Cervical Lymphadenitis Listed by Most Common Clinical Presentation

<table>
<thead>
<tr>
<th>Acute, bilateral lymphadenitis</th>
<th>Viral upper respiratory infections</th>
<th>Streptococcus pyogenes pharyngitis</th>
<th>Varicella zoster virus</th>
<th>Herpes simplex virus</th>
<th>Rubella</th>
<th>Rubeola</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute, unilateral lymphadenitis</td>
<td>Staphylococcus aureus</td>
<td>Streptococcus pyogenes without pharyngitis</td>
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<td></td>
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<tr>
<td>Chronic, bilateral lymphadenitis</td>
<td>Epstein-Barr virus</td>
<td>Cytomegalovirus</td>
<td>Toxoplasma gondii</td>
<td>Human immunodeficiency virus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic, unilateral lymphadenitis</td>
<td>Nontuberculous mycobacteria</td>
<td>Bartonella henselae</td>
<td>Mycobacterium tuberculosis</td>
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rifampin or ethambutal which should be tailored to specific sensitivity patterns of the isolates detected. However, debate still exists on optimal antibiotic management of NTM and whether it is even necessary.

Conclusion: Pediatric lymphadenitis presents a diagnostic challenge to the treating physician, requiring assessment of multiple clinical and historical factors. A clear understanding of the various underlying etiologic factors and their typical presentation can guide the hospitalist in clinical decision-making, including when to use surgical modalities for diagnosis and treatment.

References

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