

Clinical Approach of Lymphadenitis in a Tertiary Medical Center in Albania



Healthcare

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Abstract

Lymphadenopathy refers to any disease process involving lymph nodes that are abnormal in size and consistency. Lymphadenitis specifically refers to lymphadenopathies that are caused by inflammatory processes. Cervical lymphadenopathy is a common problem in clinical setting which is largely inflammatory and infectious in etiology. Although most patients are treated successfully by their primary care physician, surgical consultation is frequently required for patients who fail to respond to initial therapy or for those in whom there is an index of suspicion for a neoplastic process. This article addresses current approaches to the diagnosis and management of cervical lymphadenitis in a service of tertiary – Mother Teresa University Hospital Centre in Albania.

Introduction

Lymphadenopathy refers to any disease process involving lymph nodes that are abnormal in size and consistency. This condition has multiple etiologies, the most common of which are neoplasia, autoimmune diseases, and infection. *Lymphadenitis* refers to lymphadenopathies that are due to inflammatory processes. It is characterized not only by nodal swelling, but also by pain, skin changes, fever, edema, and/or purulent collections. In younger age groups, most lymphadenopathies are attributable to an infectious etiology. For instance, cervical lymphadenitis is a common pediatric problem, and most patients with this condition are treated successfully at our infectious service of tertiary - university hospital. Nevertheless, surgical consultation is often required to assist in the diagnosis and treatment of patients who do not respond to initial therapy or in whom there is an index of suspicion for a neoplastic process. This article addresses contemporary approaches to the diagnosis and management of cervical lymphadenitis in our infectious service of tertiary – Mother Teresa University Hospital Centre.

Discussion

Anatomy and physiology

Although lymph nodes are located throughout the lymphatic system, they are concentrated in certain areas of the body, including the head and neck. Because infectious processes involving the oropharyngeal structures are common therefore cervical lymphadenitis is also common. Lymphatic drainage follows well-defined patterns. As such, the location of the enlarged lymph node is a good indication of the likely site of entry of the inciting organism (Figure 1). Involvement of superficial or deep cervical lymph nodes is also frequently indicative of the site of entry since superficial nodal enlargement usually reflects invasion through an epithelial surface (buccal mucosa, skin, scalp), whereas deep nodal enlargement results from an infectious process involving more central structures (middle ear, posterior pharynx).

Lymph nodes contain T and B lymphocytes as well as antigen-presenting macrophages (dendritic cells). Tissue lymph enters the lymph node via one or more afferent vessels and percolates through a series of reticuloendothelial lined channels that coalesce and drain through an efferent lymphatic vessel. Particulate matter is phagocytosed by macrophages lining the lymphatic channels. Once phagocytized, foreign proteins become bound to major histocompatibility (MHC) antigens and are presented on the surface of macrophages.

Foreign proteins bound to MHC class II molecules on the surface of dendritic cells, in combination with other cell surface receptors and secreted cellular signals (interleukins), are required for activation of T-helper lymphocytes.

These lymphocytes can in turn activate naïve B-lymphocytes. Alternatively, memory B-lymphocytes may be directly activated by dendritic cells. Once activated, Band T-lymphocytes proliferate to create a pool of lymphocytes that have the ability to recognize and bind the inciting foreign protein. In addition, activated T-lymphocytes and macrophages release cellular signals (cytokines) that induce leukocyte chemotaxis and increase vascular permeability.

The symptoms associated with acute cervical lymphadenitis reflect these pathophysiologic events. Nodal enlargement occurs as a result of cellular hyperplasia, leukocyte infiltration, and tissue edema. Vasodilation and capillary leak in response to locally released cytokines causes erythema and edema of the overlying skin, and tenderness results from distention of the nodal capsule.



Figure 1. Diagram - lymphatic drainage and nodal regions in the head and neck.

Evaluation

History and physical examination

A thorough history and complete physical examination often suggests the probable cause of cervical lymphadenitis. Consideration of whether symptoms and presentation are acute, subacute, or chronic is often helpful in establishing a differential diagnosis. Clearly, the definitions of these categories are arbitrary, and many infectious processes are associated with symptom duration that fits into more than one category.

In general, however, acute lymphadenitis, which can be 2 weeks in duration, is due to either a viral or bacterial invasion. Chronic lymphadenopathy is more likely to be due to a neoplastic process or invasion by an opportunistic organism. Subacute lymphadenitis, which is 2 and 6 weeks in duration, encompasses a much broader group of potential etiologies. In practice, surgeons seldom are involved in the care of patients with acute lymphadenitis unless the lymph nodes become suppurative. Most of these patients improve during a course of antibiotic therapy prescribed by physician. Other important clinical information to obtain are the location (single

or multiple sites) and progress of neck swelling (increasing, stable, or decreasing) and the presence of systemic symptoms (eg, fever, malaise, anorexia, weight loss, or arthralgias). More specific symptoms include skin changes and pain in the region of the nodal swelling, as well as at more distant sites. A history of recent upper respiratory tract symptoms, sore throat, ear pain, toothache, insect bites, superficial lacerations or rashes, and exposure to animals may suggest possible etiologies. In addition, a history of recent travel, exposure to individuals that are ill, and immunization status should be sought. Finally, patient age is another important consideration, since lymphadenopathy in young children is overwhelmingly due to infectious etiologies, whereas adenopathy due to neoplasia increases in the adolescent age group.

Findings on physical examination may also suggest an etiology. Cervical lymph nodes are frequently palpable; however, lymph nodes larger than 10 mm in diameter are considered abnormal. As noted previously, the location of involved nodes may indicate a potential site of entry and should prompt a detailed examination of that site. Erythema, tenderness, and fluctuance suggest an acute process, most likely attributable to a bacterial invasion. Involvement of bilateral cervical lymph nodes suggests a viral origin. The characteristics of the nodes are also important. Nodes involved in neoplastic processes frequently are firm and fixed, whereas those due to infectious agents tend to be softer in consistency and often slightly mobile. Other physical abnormalities, including respiratory findings, skin lesions, hepatosplenomegaly, and adenopathy in other parts of the body may also suggest an etiology.

Finally, it is important to keep in mind that not all swellings in the neck represent enlarged lymph nodes and that congenital and acquired cysts and soft tissue lesions also present as neck masses. Often the nonnodal nature of these masses is suggested by the history or by the findings on physical examination. In equivocal cases, however, diagnostic imaging almost always reveals whether a particular swelling is due to nodal enlargement or to a cyst or soft tissue mass.

Laboratory evaluation

Laboratory tests are seldom required as part of the workup for acute cervical lymphadenitis. Leukocyte counts and markers of inflammation (C-reactive protein and erythrocyte sedimentation rate) are usually abnormal but nonspecific. Although a left shift (increased percentage of immature white cells) on the leukocyte differential count suggests a bacterial etiology, this etiology frequently is suggested by the clinical presentation alone. Any material that has been aspirated due to fluctuance should be sent for culture and sensitivity. These cultures may show an organism that is resistant to prior antibiotic therapy, but occasionally they are negative due to eradication of the infectious agent by a prior course of antibiotics. Blood cultures should be obtained in any patient that appears toxic. Cultures of other sites that appear to be the primary site of the infection (like pharynx) should also be obtained, although results from pharyngeal cultures may not correlate with organisms isolated from a nodal abscess.^{1,2,3}

In contrast, laboratory evaluation plays a crucial role in determining the etiology of subacute, chronic, and generalized lymphadenopathy. Serologic tests for *Bartonella henselae*, syphilis (VDRL), toxoplasmosis, cytomegalovirus (CMV), Epstein-Barr virus (EBV), tularemia, brucellosis, histoplasmosis, and coccidiomycosis may suggest an infectious agent. A strongly positive intradermal tuberculin skin test is consistent with an infection due to *Mycobacterium tuberculosis*, whereas a lesser reaction to tuberculin skin testing is more consistent with a nontuberculous mycobacterial infection. Finally, serologic testing for human immunodeficiency virus (HIV) should be considered in any patient with at-risk behaviors, generalized lymphadenitis, and unusual or recurrent infections caused by opportunistic organisms.

Diagnostic imaging

Plain radiographs are seldom necessary in patients with acute cervical lymphadenitis, but may occasionally document the primary site of an infection (pneumonia, sinusitis, or dental caries). Plain radiographs are more valuable in the child with chronic or generalized adenopathy. Plain radiographs of the chest may suggest involvement of mediastinal lymph nodes or the lungs and are indicated in all patients with respiratory symptoms. Chest radiographs with two views should also be obtained in any patient with either symptomatic or asymptomatic cervical adenopathy. This is done to rule out critical airway compression if a biopsy under general anesthesia is planned. Other findings on plain radiographs may include bony lesions consistent with osteomyelitis or tumor involvement, evidence of hepatic and/or splenic enlargement, and/or calcifications involving the liver or spleen, suggesting a chronic granulomatous infection. In routine practice, however, plain radiographs of anatomic regions other than the chest are seldom required.

Ultrasonography (US) is the most frequently obtained and the most useful diagnostic imaging study. High-resolution US is used to assess nodal morphology, longitudinal and transverse diameter, and internal architecture. Doppler US is used to assess the presence of perfusion and its distribution, as well as to obtain measures of vascular resistance. Advantages of US are that it is noninvasive and avoids ionizing radiation and can be performed without sedation in almost every patient. Additionally, serial US can be performed to follow nodal diameters and architecture over time. One potential drawback of US, however, is its lack of absolute specificity and sensitivity in ruling out neoplastic processes as the cause of nodal enlargement. Thus, findings that are interpreted as being consistent with an infectious etiology might result in a false sense of security and delay diagnostic biopsy. US in the acute setting is primarily of value in assessing whether a cervical swelling is nodal in origin or is attributable to an infected cyst or other soft tissue mass. Also, it may detect an abscess not already apparent on physical examination and that requires drainage. In patients with subacute or chronic adenopathy, US is often used in an attempt to determine whether nodal enlargement is neoplastic or infectious in origin. Findings on gray-scale US shown to be consistent with reactive lymphadenopathy include a long- to short-axis ratio of greater than 2.0 (ie, oval shape), central irregular hyperechogenicity, blurred margins, and central necrosis.⁴ Findings on color Doppler examination reported to be consistent with a reactive lymphadenopathy include hilar vascularity⁴ and a low pulsatility index.⁵ However, neither of these features, alone or in combination, have been shown to consistently distinguish between benign and malignant etiologies.^{6,7} Thus, although suspicious US findings may be useful in indicating the need for biopsy, US should not be considered as a definitive means to rule out neoplasia in patients with persistent lymphadenopathy. Cross-sectional diagnostic imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) are of little value in managing most patients with cervical lymphadenitis, but may provide a useful roadmap in patients undergoing nodal excision with suspected atypical mycobacterial lymphadenitis. These studies certainly are indicated in patients with a biopsy-verified diagnosis of neoplasia.

Conclusion

Cervical lymphadenopathy is largely inflammatory and infectious in etiology, although in some patients it may be related to neoplastic disease. Management varies depending on the cause and presentation of cervical lymphadenitis. As such, treatment options will be considered within the framework of specific etiologic agents. Close follow-up is required to monitor the need for either additional diagnostic tests or biopsy should a patient fail to respond to appropriate initial therapy.

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