History of Pulmonary Tuberculosis
A. Thomas Pezzella

Tuberculosis (TB) parallels the history of human development from the Stone Age to the present. TB continues to be in the top 10 causes of global human mortality over that period. This article highlights the history of pulmonary TB from the onset of human existence to the present. Despite its long history, TB was slowly identified as a major cause of disease, and defined causation and significant treatment strategies advances over the past 150 years. TB remains a major challenge for definitive global prevention and cure. This article gives a brief overview of the history of TB.

The Global Fight Against Tuberculosis
Charles L. Daley

An estimated 1.7 billion (23%) of the world’s population is infected with Mycobacterium tuberculosis leading to more than 10 million new tuberculosis (TB) cases each year. TB is one of the top 10 causes of death globally and is the leading cause of death from a single infectious disease agent. The World Health Organization’s ambitious End TB Strategy aims to achieve a 95% reduction in TB deaths and 90% reduction in TB incidence rates by 2035.

Current Medical Management of Pulmonary Tuberculosis
Robert W. Belknap

Tuberculosis (TB) remains a common cause of infection and disease in much of the world. The majority of disease occurs from reactivation months or years after initial infection and most often involves the lungs. Sputum smears for acid-fast bacilli remain the initial diagnostic test but have limited sensitivity and specificity. Nucleic acid amplification tests are more sensitive and specific and can detect some mutations that cause drug resistance. Treatment of TB resistant to rifampicins alone or in combination with isoniazid and other drugs remains difficult and should be done in consultation with an expert in treating drug-resistant disease.

Surgical Resection in the Treatment of Pulmonary Tuberculosis
Piotr K. Yablonskii, Grigorii G. Kudriashov, and Armen O. Avetisyan

Surgery for tuberculosis is becoming more relevant today. This article discusses the main indications, contraindications, features of operations, and perioperative period. This information is useful for practicing surgeons and specialists in the treatment of pulmonary tuberculosis.
Multidrug-resistant tuberculosis (TB), extensively drug-resistant TB, and TB–human immunodeficiency virus (HIV) coinfection require a special approach in anti-TB treatment. Most patients cannot be successfully cured by conventional chemotherapy alone. They need a modern approach using minimally invasive therapeutic and surgical techniques. The novel approaches of collapse therapy techniques and minimally invasive osteoplastic thoracoplasty increase the effectiveness of complex anti-TB therapy. Achieving the required selective collapse of lung tissue in destructive pulmonary TB, especially in cases of drug resistance and/or HIV coinfection, leads to bacteriologic conversion, cavity closure, and successful cure.

Nontuberculous Mycobacteria: Epidemiology and the Impact on Pulmonary and Cardiac Disease

Wendi K. Drummond and Shannon H. Kasperbauer

This article reviews the current epidemiology of nontuberculous mycobacterial pulmonary disease and the impact on thoracic disease. The prevalence of nontuberculous pulmonary disease in the United States is much higher than that of Mycobacterium tuberculosis. Estimates support an annual increase in incidence of 8% per year. Nontuberculous mycobacteria are distinguished by 2 group designations, slowly growing mycobacteria, such as Mycobacterium avium complex, and rapidly growing mycobacteria, which includes Mycobacterium abscessus. Most pulmonary infections in humans are caused by species belonging to M avium complex. This article also reviews risk factors for disease acquisition, including host and environmental risk factors.

Medical Management of Pulmonary Nontuberculous Mycobacterial Disease

Julie V. Philley and David E. Griffith

Nontuberculous mycobacterial (NTM) lung infections are increasingly recognized as a cause of chronic pulmonary disease. This article focuses on the most common NTM species known to cause human lung disease and the treatment options currently available. The diagnosis of NTM lung disease is also discussed, emphasizing the necessity for treating clinicians to have sufficient familiarity of the mycobacteria laboratory to provide optimal patient management.

Surgical Treatment of Pulmonary Nontuberculous Mycobacterial Infections

John D. Mitchell

Adjuvant surgical resection in the setting of pulmonary nontuberculous mycobacterial (NTM) infection removes focal parenchymal disease thought to serve as a poorly perfused “reservoir” for organisms, thus resistant to standard antimicrobial therapy. Removal of these areas of damaged lung is felt to enhance the effectiveness of the medical treatment. In general, these operations are associated with low morbidity and mortality, although resections that are more extensive carry higher risk. Many of the planned operations may be performed with minimally invasive techniques. More data are needed regarding long-term outcomes in these patients.
Special Articles

Mycobacterial Musculoskeletal Infections

John I. Hogan, Rocío M. Hurtado, and Sandra B. Nelson

Although less common as causes of musculoskeletal infection than pyogenic bacteria, both Mycobacterium tuberculosis and nontuberculous mycobacteria can infect bones and joints. Although tuberculous arthritis and osteomyelitis have been recognized for millennia, infections caused by nontuberculous mycobacteria are being identified more often, likely because of a more susceptible host population and improvements in diagnostic capabilities. Despite advances in modern medicine, mycobacterial infections of the musculoskeletal system remain particularly challenging to diagnose and manage. This article discusses clinical manifestations of musculoskeletal infections caused by Mycobacterium tuberculosis and nontuberculous mycobacteria. Pathogenesis, unique risk factors, and diagnostic and therapeutic approaches are reviewed.

Nontuberculous Mycobacterial Infections in Cystic Fibrosis

Stacey L. Martiniano, Jerry A. Nick, and Charles L. Daley

Nontuberculous mycobacteria (NTM) are important emerging cystic fibrosis (CF) pathogens, with estimates of prevalence ranging from 6% to 13%. Diagnosis of NTM disease in patients with CF is challenging, as the infection may remain indolent in some, without evidence of clinical consequence, whereas other patients suffer significant morbidity and mortality. Treatment requires prolonged periods of multiple drugs and varies depending on NTM species, resistance pattern, and extent of disease. The development of a disease-specific approach to the diagnosis and treatment of NTM infection in CF patients is a research priority, as a lifelong strategy is needed for this high-risk population.

Tuberculosis in Children

Tania A. Thomas, MD, MPH

Mycobacterium tuberculosis is the leading cause of death worldwide from a single bacterial pathogen. The World Health Organization estimates that annually 1 million children have tuberculosis (TB) disease and many more harbor a latent form. Accurate estimates are hindered by underrecognition and challenges in diagnosis. To date, an accurate diagnostic test to confirm TB in children does not exist. Treatment is lengthy but outcomes are generally favorable with timely initiation. With the End TB Strategy, there is an urgent need for improved diagnostics and treatment to prevent the unnecessary morbidity and mortality from TB in children.