A Painful Swelling on the Chest

(See pages 100–2 for the Photo Quiz)

Figure 1. Chest radiograph demonstrating a shadow on the lower field of the right lung (arrow) and pleural thickening.

Diagnosis: Thoracic actinomycosis.

Gram stain of the purulent aspirate obtained from the mass protruding through the thoracic wall (figures 1 and 2) showed irregular gram-positive rods without branching, as well as gram-negative rods (figure 3). Aerobic and anaerobic cultures yielded 3 bacterial strains. The first—an anaerobic, slow-growing, catalase-negative gram-positive rod—was identified as *Actinomyces israelii* by 16S RNA gene sequencing. The second strain was another anaerobic, very slow-growing, slender gram-negative rod with pointed ends, identified by 16S RNA gene sequencing as *Fusobacterium nucleatum*. The third microorganism that was isolated was a fastidious, catalase-positive gram-negative rod that was identified as *Actinobacillus actinomyctemcomitans*.
Figure 2. CT scan of the thorax, showing a mass protruding through the thoracic wall (arrows)

It is common to find several species of bacteria in clinical samples together with Actinomyces species. The composition of flora possibly reflects the source of infection, which in this case is most likely the oral cavity. Poor dental hygiene is a predisposing factor for the development of thoracic actinomycosis, the route of infection being either aspiration or via the deep cervical fascial spaces through the mediastinum [1]. It is now widely accepted that actinomycotic infections are polymicrobial and synergistic in nature. Although monomicrobial infections undoubtedly occur, inadequate bacteriologic evaluation or diagnoses made on the basis of clinical or pathologic grounds will result in a failure to identify concomitant bacterial species. A. actinomycetemcomitans, Eikenella corrodens, Fusobacterium species, Bacteroides species, Capnocytophaga species, Staphylococcus species, Streptococcus species, and Enterobacteriaceae have been commonly isolated in various combinations, depending on the site of the infection. The concomitant organisms are thought to facilitate development and establishment of an actinomycotic lesion, and it therefore seems reasonable to consider them to be potential copathogens when designing therapeutic regimens (e.g., A. actinomycetemcomitans is associated with a chronic course of infection, and failure of therapy can be associated with persistence of this microorganism) [2, 3].

Thoracic actinomycosis is a rare condition. The diagnosis depends on demonstrating the presence of viable Actinomyces species in affected pulmonary or pleural tissue or in the chest wall. Unless there is endobronchial involvement, bronchoscopy is not helpful in obtaining the diagnosis, and culture of bronchial washings may often only show colonization. A surgical approach is usually required to obtain the clinical specimen. However, a percutaneous biopsy can be attempted before employing more-invasive procedures [4]. In this case, the palpable infiltrate on the thorax of the patient was easily accessible for fine-needle aspiration, even without radiological guidance. It should be noted that, although bronchoscopy revealed no malignancy, a (coexisting) neoplasm could easily go undetected if only a percutaneous approach was used.

Our patient was treated with high-dose intravenous penicillin (18 MU) for 2 weeks, followed by amoxicillin (1500 mg daily in 3 doses). A quick recovery was observed, with restoration of the patient’s body weight to 64 kg and normalization of inflammatory and hematological laboratory values. A chest radiograph obtained 3 months after commencing antibiotic therapy showed near complete regression of the infiltrative abnormalities. Because of the good clinical response and expected excellent prognosis [5], treatment was discontinued after 3 months. The patient was referred for dental sanitation and has remained healthy during a 9-month follow-up period.
Figure 3. Gram stain of the purulent transthoracic aspirate, showing irregular gram-positive rods (arrow 1) and slender, pointed gram-negative rods (arrow 2) (oil immersion; original magnification, 10 × 100).

Acknowledgments

We thank Prof. Dr. E. J. van der Jagt for providing the radiographic images.

Potential conflicts of interest. All authors: no conflicts.

Financial support. GlaxoSmithKline.

R. M. H. G. Huits,1 H. L. J. Winter,2 and D. J. Slebos3
Departments of 1Internal Medicine, 2Medical Microbiology, and 3Pulmonary Diseases, University Medical Center Groningen, Groningen, The Netherlands

References


Reprints or correspondence: Dr. D. J. Slebos, Dept. of Pulmonary Diseases, University Medical Center Groningen, PO Box 30001, 9700 RB Groningen, The Netherlands (d.j.slebos@int.umcg.nl).