Actinomycosis of the Trachea with Acute Tracheal Obstruction

Actinomycosis is a chronic suppurative infection that often involves the lower face and neck and, less often, the chest and abdomen. Only eight previous cases of tracheal or laryngeal actinomycosis have been reported in the literature [1]. Lesions in the larynx are often preliminarily diagnosed as malignancy on the basis of their gross appearance [1]. We describe a case of laryngeal actinomycosis that is also the first recorded incidence of acute tracheal obstruction due to laryngeal infection with Actinomyces naeslundii.

A 64-year-old man presented to another hospital with a 6-month history of worsening throat pain and difficulty swallowing. He had seen his local physician who noted that the pharynx appeared normal; cultures of pharyngeal specimens did not yield any pathogens. He was treated with several 2-to-3-week courses of antibiotics without noticeable improvement in his condition. His medical history was significant for smoking (>45 packs per year), mild chronic obstructive pulmonary disease, and moderately severe rheumatoid arthritis that required treatment with prednisone (5 mg daily).

He was evaluated by an otolaryngologist for persistent throat pain. An indirect mirror examination revealed marked swelling of the larynx in the area of the posterior arytenoid cartilage. The patient was scheduled to undergo a biopsy at another hospital. On arrival at the hospital he was wheezing, and shortly thereafter he went into respiratory arrest. Intubation was not possible because of complete tracheal obstruction, and an emergency tracheostomy was performed.

Direct laryngoscopy revealed a large circumferential tracheal ulcer just distal to the larynx with marked swelling and areas of purulent drainage. Examination of a biopsy specimen of the ulcer edge demonstrated a fibrinopurulent exudate with aggregates of filamentous bacteria. Cultures were negative for aerobic bacteria, viruses, and fungi. The biopsy specimen was not cultured anaerobically. The bacteria observed in the biopsy specimen were interpreted as contaminants. The patient was thought to have a laryngeal malignancy and began treatment with steroids; the tracheostomy remained in place.

The patient continued to have throat pain and was referred to our hospital 2 months later. Examination of a specimen obtained by a second biopsy demonstrated acute and chronic inflammation with a fibrinopurulent exudate. Sulfur granules were present in the inflammatory tissue (figure 1). Gram-positive filamentous bacteria were also present and had invaded the adjacent cartilage. The microorganisms also stained well with Grocott-Gomori methenamine-silver nitrate stain. These features are all typical of disease due to Actinomyces species [2]. Aerobic cultures of the biopsy tissue did not yield any microorganisms, but the anaerobic culture yielded A. naeslundii.

The patient was treated with intravenous penicillin G (12 million units daily) for 3 months followed by another 3 months of therapy with oral penicillin V (2 g daily). Repeated laryngoscopy demonstrated complete resolution of the lesion, and the tracheostomy was removed.

Actinomycosis of the larynx or trachea is uncommon, and few cases have been reported in the literature [1, 3, 4]. Several patients previously described have developed laryngeal actinomycosis following radiation therapy for carcinoma [3]; the other patients de-

Figure 1. Acute and chronic inflammation with a central sulfur granule seen in a specimen obtained from the second tracheal biopsy performed for a patient who had laryngeal actinomycosis with acute tracheal obstruction. The epithelial lining of the trachea has been destroyed, and there is destruction of the underlying cartilage. Filamentous structures line the tracheal lumen side of the biopsy specimen (stain, hematoxylin-eosin; original magnification, × 400).
scribed have presumably been healthy hosts. Our patient had several debilitating diseases and was receiving chronic steroid therapy, but there was no known local insult to the larynx, history of dental work, or periodontal disease that would have predisposed him to actinomycosis.

The results of the first biopsy of our patient’s larynx were incorrectly interpreted, possibly because of the rarity of this entity, i.e., laryngeal actinomycosis coupled with the presentation of acute tracheal obstruction. On review of the initial biopsy tissue, it was apparent that what was believed to be contaminant bacteria at the other hospital were, in fact, filamentous, gram-positive microorganisms that were compatible with actinomycetes.

*A. naeslundii* is the third most common cause of actinomycosis. It is said to form sulfur granules less readily than *Actinomyces israelii*, but free filaments of the microorganism are seen in tissue specimens more often than in specimens from patients infected with *A. israelii* [5]. Since actinomycetes are strict anaerobes, the failure to culture the patient’s earlier biopsy specimens for anaerobic bacteria most likely accounted for the failure to isolate the microorganism.

Intravenous treatment for actinomycosis was continued for 3 months because of the severity of the clinical presentation, the presence of a tracheostomy for most of the therapeutic period, and the concurrent use of prednisone therapy for rheumatoid arthritis (the effect of this therapy on healing and cure is unknown).

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References