Case History No. 8

From Dr. Tortora...

More than a sore throat...

A 20 year old male was admitted to our hospital from the emergency department (ED) with a fever of 40°C (104°F) of two days duration accompanied by chills and sweats.

His history included a sore throat three days prior to the ED visit. A non-pruritic rash was noted on his trunk and upper extremities. Blood cultures were drawn in addition to the standard pre-admission protocol.

The complete blood count (CBC) revealed a high white count with an increase in band forms (immature leukocytes). The department of infectious diseases (ID) was consulted at this point.

A chest radiograph and a computerized tomography (CT) resulted in the diagnosis of Lemierre’s disease (septic thrombophlebitis of the internal jugular vein). The clinical microbiology laboratory was advised by ID to be alert for *Fusobacterium necrophorum* that is reported in the literature as responsible for 80% of the cases.

The patient was placed on an antibiotic regimen specific for *Fusobacterium necrophorum*.

Figure 1:  CT scan of the neck showing (white arrow) a gas filled abscess of a patient with Lemierre’s disease.

Figure 1: This photomicrograph shows *Fusobacterium necrophorum* bacteria cultured in a thioglycollate medium for 48 hours. *F. necrophorum* is a nonmotile, gram-negative anaerobe that normally inhabits the pharynx, gastrointestinal tract, and female genital tract. It is one of the major causative agents of Lemierre’s syndrome. Photo from CDC.
The first two blood cultures yielded the suspect organism, however the patient improved only marginally on the prescribed regimen.

Three more sets of blood cultures taken while on the original therapy proved negative for *Fusobacterium necrophorum*; however, *Gram stains of both aerobic and anaerobic bottles demonstrated Gram positive rods that were reported presumptively as *Corynebacterium* sp.

What was the second organism?

Upon request by ID, I reviewed the Gram stains of both the aerobic and anaerobic bottles and saw micro-colonies of tangled Gram positive rods exhibiting branching. Rudimentary branching was seen on Gram stains of the anaerobic bottles, but no branching was seen on stains of the aerobic bottles.

βeta hemolytic colonies of this second organism were recovered upon subculture of the blood cultures bottles to 5% Sheep blood agar.
**Discussion**

I suggested *Arcanobacterium haemolyticum* and was informed of the antecedent sore throat. A new antibiotic regimen of vancomycin and piperacillin-tazobactam was initiated and within 48 hours the patient improved dramatically with a drop in temperature and leukocytosis.

The presumptive identification of *Corynebacterium* spp. based on the Gram stain is not surprising since *Arcanobacterium haemolyticum* originally was designated as *Corynebacterium haemolyticum*.

The clinical microbiology laboratory identified the isolate as *Arcanobacterium haemolyticum* using three different methods: Vitek ANI card, the Coryne strip (bioMerieux) and standard microbiological protocols, including carbohydrate fermentation, catalase, urease, nitrate, and inhibition of the CAMP reaction.

This case clearly demonstrates the pathogenic potential of *Arcanobacterium haemolyticum* and the need to review β-hemolytic colonies morphologically resembling *Streptococcus* spp. that fail to group with available latex agglutination tests or are simply reported as “non-Group A strep.”

A Gram stain to check for Gram positive rods is essential, as is a catalase test, as most corynebacteria are catalase positive. A selective medium for the isolation of *Arcanobacterium haemolyticum* can prove to be invaluable in screening for this organism.

**Lemierre’s syndrome** – is a rare condition in which bacteria spreads from the throat to the interior jugular vein in the neck. Small emboli or ‘clumps’ of bacteria then travel through the bloodstream to the lungs, joints and bones. Lemierre’s syndrome can be easily treated with antibiotics, but it can be fatal if it is not diagnosed correctly and quickly.

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Figure 3: *Arcanobacterium Selective Medium*, Cat no. A134, available from Hardy Diagnostics, is designed to isolate *A. haemolyticum* and inhibit other respiratory flora.
References


2. Forbes, BA, DF Sahm, and AS Weisfeld, 2002, Bailey and Scott’s Diagnostic Microbiology, pp 342-349, Mosby, Inc., St. Louis, Missouri

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