

First Case of a Neonatal Pharyngeal Infection by *Corynebacterium kroppenstedtii*

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To Editor

Corynebacterium kroppenstedtii is the newest species of the genus *Corynebacterium* discovered in 1998, with only 35 hits on PubMed. Among them, most of the reports are about the causative bacteria of granulomatous mastitis. Other than that, there was only one case of the founder's sputum sample, bacterial endocarditis, and Jones tube infection in ophthalmology and this report is the first case for neonatal pharyngitis. Since this is the first case in neonates, it may be said that this bacterium is the causative bacterium. However, this time, we performed laryngeal mirror examination under direct vision in the search for the cause of the initial symptoms of hoarseness, confirmed yellow sputum-like mucus at the same site as the redness near the epiglottis, swabbed the substance, and performed bacterial culture. *C. kroppenstedtii* is a lipophilic bacterium, and its pathogenicity in the pharynx cannot be scientifically proven in this case report, but unlike routine culture in which the pharynx is swabbed blindly, the inflamed area can be aimed directly under direct vision. If newborns have symptoms of hoarseness or stridor, laryngeal mirror examination is also a diagnostic method.

Case Report

A male infant was born by vacuum delivery for the indication of weak labor at 39 weeks' gestation with a birthweight of 2922 g. In the early postnatal period, he was managed as a normal-term neonate and rooming-in was started with the mother. Breast milk was started directly from 8 hours after birth. Because he showed mild retractions and mild grunting at 22 hours after birth, he was admitted to the NICU for suspicion of upper respiratory tract infection (URI) with poor aeration in both lungs on auscultation and observation of pharyngeal injection with the aid of a tongue depressor. There was no stridor, but hoarseness was present between days 2 and 5. Laryngeal mirror observation of the area around the larynx showed primarily red-colored infiltration to the epiglottis and yellow sputum-like mucus at the tracheal entrance. As soon as N-CPAP with $FiO_2=0.21$ was initiated, the infant's SpO_2 value rose to 99-100%. Blood and biochemical data on NICU admission showed no obvious signs of infection, but clinical suspicion of local infection of the upper respiratory tract led to the immediate initiation of intravenous antibacterial therapy with ABPC and GM. Bronchial fiberoscopy examination performed at 8 days of age showed mild pharyngeal collapse and localized laryngeal edema with subsidence of the tongue root. The pharyngeal redness itself had almost disappeared by this time, so ABPC and GM were terminated (Figure 1).

No pathogenic bacteria were isolated from bacterial cultures of pharyngeal swab, nasal cavity, external ear, and blood specimens on admission. To confirm the presence of isolates from the pharyngeal swab, on the basis of the clinical symptoms, we asked the clinical laboratory to perform enrichment culture from which Gram-positive rods were isolated after 2 weeks (Figure 2). This bacterium was subjected to MALDI-TOF MS (matrix-assisted laser desorption/ionization-time of flight mass spectrometry) manufactured by SRL, and identification of *Corynebacterium kroppenstedtii* was considered highly reliable based on a score of 2.29. N-CPAP was continued up to 18 days after birth. Laryngeal expansion was performed again on day 22, which showed relief of the laryngeal edema. He was discharged on day 25.

The mother's breast had several lumps on both sides, but there was no tenderness, no fever, no sensation of heat, and no pus-like or bloody breast milk when expressing milk. Therefore, no bacterial culture was performed. As the infant's respiratory symptoms developed less than 24 hours after birth, horizontal infection between mother and child after delivery was considered most likely.

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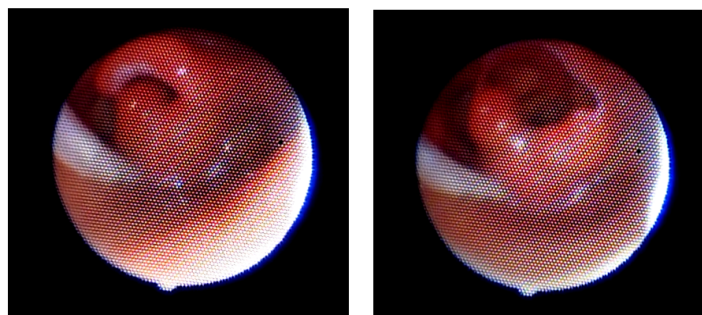


Figure 1: Laryngo-bronchial fiberscope findings on 8 days after birth. This is the finding on the 6th day after the start of treatment. Significant edema remains localized in the epiglottis. Redness is clearly reduced compared to admission. No abnormalities in tracheal or bronchial structure or function were observed. Mild collapse of the pharynx was confirmed. The left figure shows the expiratory phase, and the right figure shows the inspiratory phase.

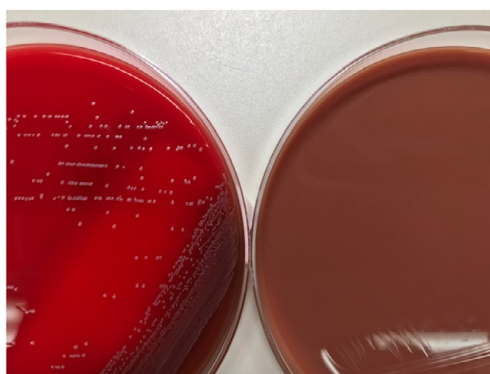


Figure 2: A colony of bacteria cultivated in a 5% CO₂ incubator at 35 °C for 3 days. After using HK semisolid agar enrichment medium (Kyokuto Pharmaceutical Japan) for about 2 weeks, with Trypticase Soy Agar with 5% Sheep Blood (Becton Dickinson Japan), a colony with a diameter of about 1 mm was formed in the area (left). But Chocolate II Agar (Becton Dickinson, Japan) showed only slight bacterial growth (right).

C. kroppenstedtii is a lipophilic bacterium, and its detection rate is increased by adding Tween 80 or the like during culture. As this bacterium is difficult to identify with current kits, it has become possible to increase the number of cells by extended culture or enrichment culture and to perform accurate species identification by MS or gene analysis [1]. This bacterium is one of a relatively new species that was first isolated from respiratory specimens in 1998 [2]. *C. kroppenstedtii* is often isolated as the causative agent of mastitis with purulent discharge and granuloma, which is common in women 2 to 4 years after delivery. Sometimes, *C. kroppenstedtii* is cultured from respiratory specimens (sputum) [2] and artificial valves in patients with bacterial endocarditis [3]. To our knowledge, this case is the first report of *C. kroppenstedtii* in a neonate. It is important to directly observe the site where abnormal symptoms are present as soon as possible and to collect a specimen from that site. The respiratory disorder occurring at 22 hours after birth was neither inspiratory nor expiratory wheezing, but because breath sounds of the bilateral lungs were weakened, the site of stenosis (or airway collapse) was the upper respiratory tract. Bronchial fiberoptic led to the definitive diagnosis.

Possibly, because *C. kroppenstedtii* is the causative agent of granulomatous mastitis, we may have just overlooked it because our neonatologists do not patiently pursue the identification of bacteria in URI. If clinical symptoms such as hoarseness, stridor, and pharyngeal injection suggest the presence of a URI, when bacterial culture near the infected site is performed, clinicians need to keep in mind that some bacteria such as *C. kroppenstedtii* cannot be identified without prolonged culture. In such cases, MALDI-TOF MS is useful for identifying the causative bacteria [4].

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