

the literature, which are summarized in Supplemental Table 1 (<http://links.lww.com/OLQ/A398>).¹⁻⁴

In adults, gonococcal conjunctivitis typically occurs in patients with urogenital infection and is thought to be caused by autoinoculation from the genital tract via contaminated hands. However, there is also evidence for alternative modes of transmission for gonococcal conjunctivitis, including sexual exposure, laboratory exposure, and transmission through fomites.⁷ We suspect our patient developed the ocular infection through autoinoculation, as she had concomitant genitourinary infection. *N. gonorrhoeae* was also isolated from her pharynx which could represent an independent primary site of infection that developed after sexual exposure, though she denied recent insertive oral sexual exposure. The isolation of *N. gonorrhoeae* from 3 different anatomical sites, with the presence of ecchymosis around the left eye without preceding trauma, raised the possibility of disseminated gonococcal infection with involvement of the small blood vessels. Disseminated gonococcal infection presenting as vasculitis has been reported, and cutaneous vasculitis can be the sole manifestation of the disease.⁸ However, there was no additional cutaneous involvement, tenosynovitis, or bacteremia to support disseminated gonococcal infection, and severe local inflammation likely accounted for the ecchymoses around the eye. Thus, autoinoculation was the most likely mechanism in this case.

Nucleic acid amplification testing is recommended for the diagnosis of urogenital gonorrhoeae.⁹ However, NAATs have only been recently approved by the Food and Drug Administration for extragenital specimens and before this approval, laboratories provided gonococcal nucleic acid testing on rectal and oropharyngeal specimens after the performance of verification procedures.¹⁰ For ocular specimens, there are no data on the performance of NAATs, thus culture remains the recommended diagnostic test.⁹ Unfortunately, *N. gonorrhoeae* can take 3 to 5 days to grow in media, leading to delays in diagnosis of ocular infections. In our case, the turnaround time for the NAAT on the eye specimen was about 5 hours, which was also confirmed by bacterial culture. Given their high sensitivity and rapid turnaround time, NAATs offer advantages over traditional culture techniques and might serve a role in rapidly diagnosing severe eye infections. This is particularly important given the severity of infection. To our knowledge, this is the first report to demonstrate the utility of NAAT on an eye specimen to rapidly diagnose a severe *N. gonorrhoeae* eye infection in an adult.

The documented transmission of gonorrhea from contaminated hands and fomites raises important questions about the role for contact precautions. The United States Centers for Disease Control and Prevention (CDC) recommends only standard precautions for gonococcal conjunctivitis but contact precautions for acute viral conjunctivitis.¹¹ There have been outbreaks of nonsexually

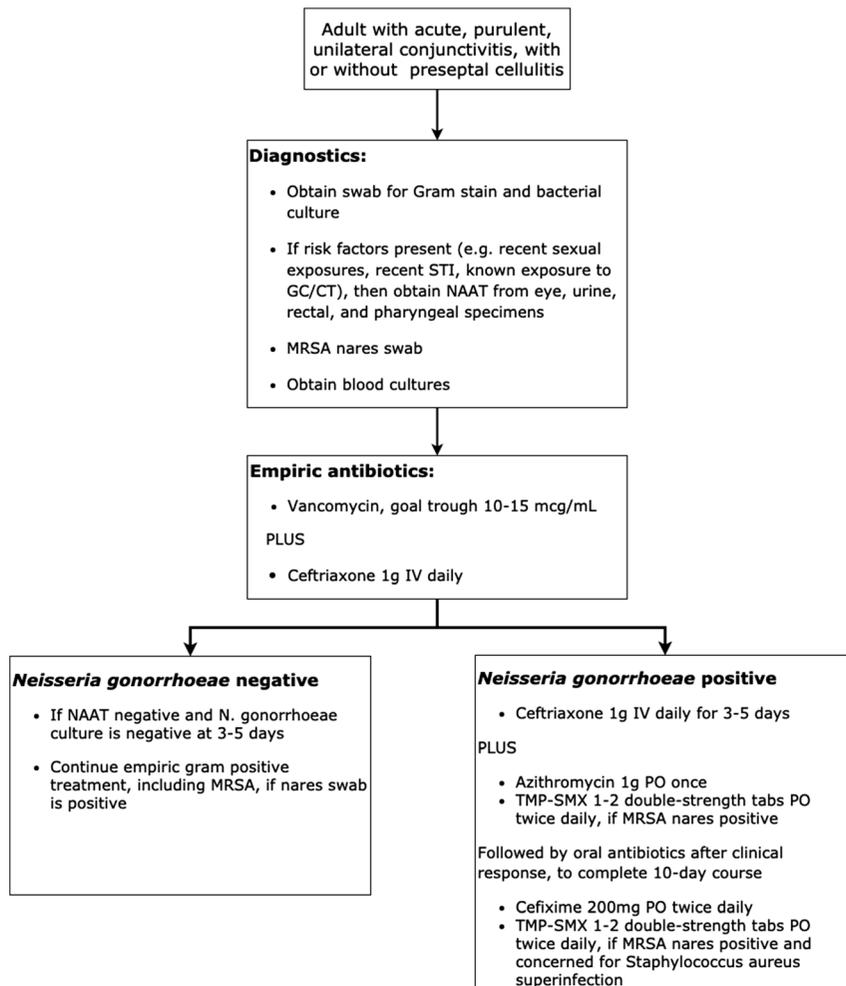


Figure 1. A clinical approach for the presentation of acute, unilateral, conjunctivitis, with or without preseptal cellulitis in an adult. STI, sexually transmitted infection; GC, *Neisseria gonorrhoeae*; CT, *Chlamydia trachomatis*; TMP-SMX, trimethoprim-sulfamethoxazole.

transmitted gonococcal conjunctivitis associated with household contacts¹²; a subsequent molecular analysis of one of these outbreaks did not identify a genitourinary reservoir for these infections.¹³ Transmission through fomites has also been reported.⁷ However, these cases were community-based outbreaks where hygiene practices may have been suboptimal, because many of these cases were among children. Nosocomial outbreaks of gonorrhea from contaminated hands and fomites have not been described. Thus, although this case report does not provide evidence to change approach to hospital infection control procedures, physicians should be vigilant about treating hospitalized patients with suspected gonococcal ocular infection and mucopurulent discharge.

In the United States, cases of gonorrhea are on the rise, and drug-resistance is a major treatment consideration. Gonococcal conjunctivitis is rare in adults, and treatment data are limited.⁹ The 2015 CDC Sexually Transmitted Disease Treatment Guidelines recommend a single dose of 1 g intramuscular ceftriaxone plus 1 g oral azithromycin for treatment of gonococcal conjunctivitis. Treatment data are even more sparse for gonococcal preseptal cellulitis, but given the severity of the infection, a more prolonged course is likely needed. The previous cases reported in the literature utilized IV ceftriaxone for 5 to 7 days in combination with an oral macrolide or fluoroquinolone, with the exception of the initial case that was a penicillin-sensitive isolate¹ (Supplemental Table 1, <http://links.lww.com/OLQ/A398>). Our patient experienced rapid improvement after 3 days of IV ceftriaxone. The patient ultimately received a total of 4 doses of ceftriaxone 1 gram IV daily and subsequently completed a 5-day course of oral cefixime 200 mg twice daily, tobramycin eye drops, and TMP-SMX twice daily and experienced good recovery. In the United States, antimicrobial susceptibility testing for *N. gonorrhoeae* isolates is not routinely performed, and when done, the turnaround time can be long. At our institution, susceptibility testing is coordinated through the county health department and the CDC, and the turnaround time can be several weeks, which limits the clinical use.

Preseptal cellulitis can be severe and increases the risk for infection extending into the orbital tissues, which can lead to vision loss, cavernous sinus thrombosis, and meningitis.⁶ Clinicians must consider *N. gonorrhoeae* as a cause of acute, unilateral, purulent conjunctivitis, with or without preseptal cellulitis. In cases of preseptal cellulitis due to gonorrhea, a prolonged course of antibiotics is recommended. In Figure 1, we propose our clinical approach to an adult patient presenting with acute, unilateral, purulent conjunctivitis, with or without preseptal cellulitis.

Gonococcal conjunctivitis is uncommon in adults. *N. gonorrhoeae* is a very rare cause of preseptal cellulitis. However, clinicians must consider *N. gonorrhoeae* infection in sexually active adults presenting with acute, unilateral, mucopurulent conjunctivitis and preseptal cellulitis, as the infection can be severe,

sight-threatening, and might progress to a more invasive infection. Rapid diagnosis is critical and currently relies on culture from an eye swab, though we propose NAATs might aid in the diagnosis. Contact isolation precautions are encouraged for patients with high clinical suspicion or diagnosed gonococcal conjunctivitis. For preseptal cellulitis, we suggest empiric antibiotics to cover MRSA, *Streptococcus* species, as well as *N. gonorrhoeae*, while awaiting microbiologic culture data. For gonococcal preseptal cellulitis, we recommend using at least 3 days of IV ceftriaxone before transitioning to oral antibiotics.

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