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Case Report
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Complication of Gonococcal Keratoconjunctivitis by Neisseria-Gonorrhoeae

Pablo Torres-Huelva OD, Timoteo González-Cruces OD, Antonio Cano-Ortiz, Alvaro Sánchez Ventosa, Francisco Javier Aguilar-Salazar and Alberto Villarrubia*

Department of Anterior Segment, Cornea and Refractive Surgery, Arruzafa Hospital, Cordoba, Spain

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Author : Pablo Torres-Huelva OD

Keywords

PKP: Penetrating Keratoplasty; NG: *Neisseria Gonorrhoeae;* Conjunctival Graft; PHACO: Phacoemulsification; PMNs: Polymorphonuclear Leukocytes; Tx: Treatment; x/d: Times per day

Clinical Case

A 45-year-old heterosexual male patient, married with one daughter, with no significant medical history in previous consultations.

He presented to the emergency department at Hospital Arruzafa on 11/08/2022 with whitish discharge, tearing, and discomfort in both eyes. Upon examination, tarsal and bulbar conjunctival hyperaemia, papillary reaction, and mild chemosis were detected.

The initial clinical diagnosis was acute conjunctivitis, likely of viral origin. Appropriate treatment was prescribed for this type of pathology, and the patient was advised to strictly adhere to a series of hygiene measures.

Five days later, the patient returned to the emergency department with abundant yellowish discharge and severe eyelid oedema. Due to the eyelid swelling, examination was difficult, but near-complete corneal lysis was observed in the right eye (RE), along with a superior descemetocele in the left eye (LE) (Figure 1). The patient was informed of the poor prognosis and seriousness of the condition. Cultures were taken due to a suspected gonococcal keratoconjunctivitis, and a new treatment regimen with daily hospital visits was initiated.

A few days after the culture was taken, the laboratory reported the growth of two colonies of Gram-positive cocci, coagulase-positive and catalase-positive—suggestive of *Staphylococcus aureus*, sensitive to tobramycin, gentamicin, levofloxacin, and erythromycin. Serologies for Hepatitis B and C, HSV, HIV, syphilis, and chlamydia were all negative. The Gram stain revealed a few polymorphonuclear leukocytes (PMNs), but no diplococci. Thus, the clinical suspicion was not confirmed by laboratory tests, yet the diagnosis of bilateral gonococcal keratoconjunctivitis remained clinically evident.

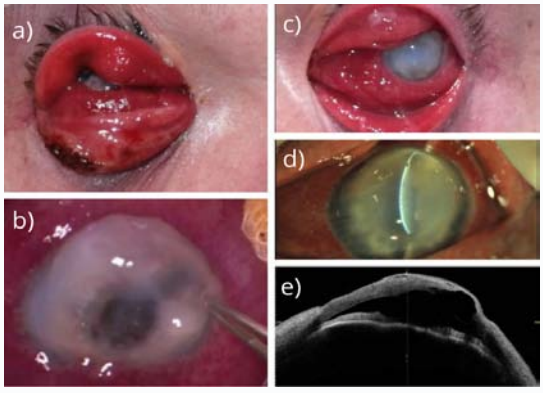

Figure 1: In the right eye (RE), it was impossible to obtain a slit-lamp image due to severe palpebral oedema (1-a); the intraoperative image of the RE (1-b) shows severe corneal lysis; the left eye shows an abscessed cornea (1-c); the preoperative image of the left eye (LE) reveals a superior descemetocele with corneal ectasia (1-d), a condition confirmed by the optical coherence tomography image (1-e).

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Correspondence:
Pablo Torres-Huelva OD, Department of Anterior Segment, Cornea and Refractive Surgery, Arruzafa Hospital, Cordoba, Spain, Tel: +34 672219120; E-mail: ptorres@hospitalarruzafa.com

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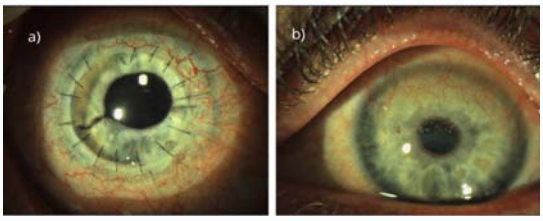

Figure 2: Clear cornea in the right eye following the third penetrating keratoplasty, under immunosuppressive treatment (2-a); conjunctival graft in the left eye with well-integrated conjunctiva and thickened cornea, prepared for future transplantation (2-b).

A penetrating keratoplasty (PKP) was performed on the RE under general anaesthesia. Additionally, two lateral iridotomies were carried out with removal of the pre-lenticular fibrin membrane, and a fresh cornea was implanted. Finally, the lower eyelid skin was trimmed and sutured with 6/0 polysorb stitches to enable closure of the palpebral fissure (Video 1).

In the immediate postoperative period, the RE PKP was stable, anterior chamber (AC) formed, and the eye was normotensive.

Due to the descemetocele in the LE, a superior conjunctival graft was performed under general anaesthesia one week later (Video 2).

At the follow-up visit, the conjunctival graft appeared well integrated, corneal melting was less extensive, and the cornea relatively transparent.

Two months after the initial RE surgery, severe generalised corneal oedema and a pre-lenticular membrane with posterior synechiae were observed. The optic disc could not be visualised in either eye. A second RE PKP combined with phacoemulsification and corresponding postoperative treatment was indicated.

In the LE, corneal thickening continued in the area of the descemetocele, with the conjunctiva remaining well integrated.

A third transplant was performed in the RE, combined with phacoemulsification, intraocular lens (IOL) implantation, membrane resection, and pupilloplasty under general anaesthesia. The postoperative course was uneventful, and six months later, uncorrected visual acuity in the RE was 0.7 with a clear cornea (Figure 2). In the LE, the anterior chamber remained formed with integrated conjunctiva and corneal ectasia; corneal transplantation is pending.

Discussion

Gonococcal conjunctivitis in adults is a rare but serious infection caused by *Neisseria gonorrhoeae*, which typically presents as hyperacute purulent conjunctivitis. It is usually associated with sexual activity involving direct contact with genitourinary secretions [1]. Clinical diagnosis is difficult, and during the early stages, the resulting keratoconjunctivitis may be misattributed to other pathogens or conditions affecting the conjunctiva, such as adenoviral conjunctivitis during outbreaks or autoimmune processes with marginal keratolysis. This can delay accurate diagnosis and lead to confusion [2]. Furthermore, *Neisseria gonorrhoeae* has demonstrated increasing resistance to antimicrobial agents. These diagnostic delays and rising resistance may result in keratolysis with severe corneal involvement [3].

Initial empirical treatment depends on whether or not there is corneal perforation. If the cornea is unaffected, outpatient systemic treatment may be sufficient, as indicated by Dr Mariann Árvai et al. and other authors: a single intramuscular dose of 1 g ceftriaxone, along with 1 g oral azithromycin to cover *Chlamydia trachomatis*.

If corneal perforation is present, the patient must be hospitalised and started on systemic antibiotics: 1 g ceftriaxone intravenously every 12 hours, combined with topical antibiotics such as levofloxacin or moxifloxacin and conjunctival sac irrigation, as recommended by M. Kawashima et al. from Tokyo Dental College, Japan [4].

Surgical treatment depends on the extent of involvement. Various options have been described in the literature, including conjunctival grafting, conjunctival grafting with scleral patch, amniotic membrane grafts, or keratoplasty. Most authors recommend performing keratoplasty only after infection control, as active inflammation at the time of surgery negatively affects graft survival [5]. They also emphasise that, given the need for large-diameter grafts, immunosuppression is essential for maintaining corneal transparency.

In our case, the patient was already diagnosed with near-complete corneal lysis in the RE. Thus, in addition to intravenous and topical treatment, he required a large-diameter PKP in the RE and conjunctival grafting in the LE. Large-diameter PKPs have a high failure rate, which occurred twice in our patient. Therefore, a smaller-diameter PKP, combined with immunosuppressive therapy (Cellcept 500 mg containing mycophenolate and tacrolimus 0.5 mg every 12 hours), has been the definitive treatment to date.

Conclusion

In the presence of hyperacute purulent conjunctivitis, *Neisseria gonorrhoeae* should be suspected. This bacterium produces proteolytic enzymes capable of corneal perforation and causing blindness within 24 to 48 hours. For this reason, it is considered an ophthalmic emergency requiring immediate medical attention.

It is essential to collect samples from ocular secretions and begin systemic empirical treatment without waiting for laboratory results. Prompt intervention is critical to prevent severe complications such as corneal perforation and irreversible vision loss.

Conflict of Interest

The authors declare that there are no relevant conflicts of interest related to the publication of this article. This case report did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors. Furthermore, the authors have no financial, personal, or professional relationships that could inappropriately influence the submitted work.

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