Corneal abscess due to *Moraxella nonliquefaciens*

Fernando Cobo,* Javier Rodríguez-Granger, Antonio Sampredo and José María Navarro-Marí

**CASE SUMMARY**

A 71-year-old man was seen due to red eye along with loss of vision in the right eye. The patient only referred to a whitish spot on the corneal surface over 3 months probably due to a strange body, but no antimicrobial treatment was started at this stage. Physical examination revealed a central corneal infiltrate in almost all the corneal thickness, an overlying epithelial defect, and a moderate corneal oedema without hypopyon. Several corneal biopsies were taken, and they were directly inoculated to aerobic blood agar (Columbia Agar 5% Sheepblood, Becton Dickinson), chocolate agar (Choco Agar, Becton Dickinson), Sabouraud agar (Sabouraud Glucose Agar, Becton Dickinson) and thioglycolate broth (Fluid Thioglycollate Medium, Becton Dickinson). All media were incubated at 37 °C, except Sabouraud agar, which was incubated at 30 °C. A corneal biopsy for study of viruses was also taken, being negative for adenovirus, *herpes simplex* (1 and 2) and enterovirus (by polymerase chain reaction). Gram staining of the fluid identified scarce Gram-negative rods. On the first day of incubation the growth of abundant colonies of a non-haemolytic and catalase- and oxidase-positive microorganism was reported in pure culture. No other microorganisms were isolated on the primary plates. A mass spectrometry method (Biotyper, Bruker) was employed to identify the strain as *Moraxella nonliquefaciens* (log score 2.08). The culture in Sabouraud agar was negative after 21 days of incubation.

The MIC of the bacteria to different antibiotics was determined by the E-test method. Until now, no breakpoints have been established for species *Moraxella* other than *Moraxella catarrhalis*. Taking into account the 2018 EUCAST breakpoints for *M. catarrhalis* [1], the strain was susceptible to all antimicrobials tested, except for amoxicillin (β-lactamase-positive). The MICs were as follows: amoxicillin–clavulanate (0.032 µg ml⁻¹), cefotaxime (0.047 µg ml⁻¹), levofloxacin (0.06 µg ml⁻¹), azithromycin (0.047 µg ml⁻¹), thrimetroprim–sulphamethoxazole (0.19 µg ml⁻¹), and amoxicillin (12 µg ml⁻¹). Treatment was started with vancomycin plus ceftazidime plus cycloplegic eyedrops, along with tobramycin in ointment. Later, vancomycin was stopped and treatment was changed to azithromycin plus ceftazidime eyedrops. The patient responded favourably with slow re-epithelialization of the cornea.

**QUESTION**

What is the main cause of endophthalmitis?

**ANSWER OPTIONS**

1. Endogenous (bacteraemia or fungaemia).
2. Exogenous (ocular surgery or trauma, extension of corneal infection).
3. Malignant diseases.
4. Idiopathic.

**DISCUSSION**

Correct Answer: 2. Exogenous (ocular surgery or trauma, extension of corneal infection).

Ocular infections due to *Moraxella nonliquefaciens* have been rarely described. To our knowledge, only eight cases of endophthalmitis due to this microorganism have been previously described in the medical literature [2–7], and here we describe the first case of corneal abscess caused by this pathogen (see Table 1). Most cases of endophthalmitis are exogenous and they are produced as a consequence of ocular surgical procedures, eye traumas or as an extension of corneal infection. Coagulase-negative staphylococci are the most common causes of post-cataract endophthalmitis, and *Bacillus cereus* is a major cause of post-traumatic endophthalmitis.

Ocular infections, such as corneal abscesses and endophthalmitis, are a medical emergency. Treatment of corneal traumas is very important in order to avoid dissemination of infection into the eye. Prompt and appropriate treatment would be expected to avoid complications.
Table 1. Main characteristics of ocular infections due to *Moraxella nonliquefaciens*

<table>
<thead>
<tr>
<th>Patient (reference/year of publication)</th>
<th>Age (years)/sex</th>
<th>Localization</th>
<th>Underlying conditions and/or risk factors</th>
<th>Clinical manifestations</th>
<th>Microbiological diagnosis</th>
<th>Identification method</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1982) Ebright JR</td>
<td>62/M</td>
<td>Endophthalmos</td>
<td>Cornea scratched by contact lens</td>
<td>Scratchy sensation</td>
<td>Vitreous fluid culture</td>
<td>Genetic transformation</td>
<td>Gentamicin+cephaloridine</td>
<td>Cure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cataract removed three years previously</td>
<td>Decrease in visual acuity</td>
<td></td>
<td></td>
<td>Penicillin G</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Treatment with prednisone and azathioprine (renal transplant)</td>
<td>Injection of the cornea</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/1985) Lobue TD</td>
<td>67/M</td>
<td>Endophthalmos</td>
<td>Intracapsular cataract extraction in both eyes (six months and one year previously)</td>
<td>Tearing and swelling of the right eyelid</td>
<td>Vitreous fluid culture</td>
<td>NR</td>
<td>Gentamicin+clindamycin</td>
<td>Cefazolin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Decreased visual acuity, pain, hypopyon, pus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Corneal microcystic edema</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Injection of the cornea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/1985) Lobue TD</td>
<td>62/F</td>
<td>Endophthalmos</td>
<td>Bilateral trabeculectomies 15 months previously DM</td>
<td>Pain, decreased vision, swelling of the eyelid, hypopyon, pus</td>
<td>Vitreous fluid culture</td>
<td>NR</td>
<td>Gentamicin+cephaloridine + cefazolin+tobramycin</td>
<td>Cure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cataract extraction and trabeculectomy for lens-induced glaucoma five months previously</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/1993) Sherman MD</td>
<td>70/F</td>
<td>Endophthalmos</td>
<td>Extracapsular cataract extraction and trabeculectomy two months previously</td>
<td>Blurred vision, eye pain, corneal oedema, small hypopyon</td>
<td>Vitreous fluid culture</td>
<td>NR</td>
<td>Cefazolin+tobramycin + cefuroxime</td>
<td>Cure</td>
</tr>
<tr>
<td>5/1993) Schmidt ME</td>
<td>79/M</td>
<td>Endophthalmos</td>
<td>Previous trabeculectomy and cataract surgery</td>
<td>Purulent discharge, decreased visual acuity, corneal oedema</td>
<td>Anterior chamber fluid culture</td>
<td>Biochemical tests</td>
<td>Amikacin+vancomycin + ceftazolin+gentamicin + ceftriaxone</td>
<td>Residual ischemic damage</td>
</tr>
<tr>
<td>6/2002) Laukeland H</td>
<td>78/M</td>
<td>Endophthalmos</td>
<td>Cataract and trabeculectomy</td>
<td>Acute blurred vision, purulent discharge, corneal oedema</td>
<td>Vitreous fluid culture</td>
<td>Phenotypic characteristics + 16S rRNA</td>
<td>Vancomycin+gentamicin + cefuroxime</td>
<td>Lost of vision</td>
</tr>
<tr>
<td>7/2002) Laukeland H</td>
<td>76/M</td>
<td>Endophthalmos</td>
<td>Cataract and trabeculectomy</td>
<td>Red eye, loss of vision, corneal oedema</td>
<td>Corneal abscess culture</td>
<td>Pellet of MS</td>
<td>Vancomycin+ceftazidime + tobramycin</td>
<td>Azithromycin</td>
</tr>
<tr>
<td>8(PR/2017) Cobo F</td>
<td>71/M</td>
<td>Cornea</td>
<td>Corneal damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M: male; F: female; DM: diabetes mellitus; NR: not reported; CRP: C-reactive protein; PR: present report.

The case of Mandelbaum et al. [3] did not show sufficient data to be included in the table.
of these lesions may help to both avoid complications and recover total vision.

Funding information
The authors received no specific grant from any funding agency.

Conflicts of interest
The authors declare that there are no conflicts of interest.

References

Five reasons to publish your next article with a Microbiology Society journal

1. The Microbiology Society is a not-for-profit organization.
2. We offer fast and rigorous peer review – average time to first decision is 4–6 weeks.
3. Our journals have a global readership with subscriptions held in research institutions around the world.
4. 80% of our authors rate our submission process as ‘excellent’ or ‘very good’.
5. Your article will be published on an interactive journal platform with advanced metrics.

Find out more and submit your article at microbiologyresearch.org.