



# Enfermedades Infecciosas y Microbiología Clínica

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## Scientific letter

### *Corynebacterium propinquum*, a rare cause of late endophthalmitis



#### *Corynebacterium propinquum*, una causa rara de endoftalmitis tardía

A 64-year-old patient with a history of type 2 diabetes mellitus and under follow-up for proliferative diabetic retinopathy with diabetic macular oedema. Over the course of three years, the patient was treated with the antiangiogenic aflibercept (40 mg/ml, 21 0.05-ml injections in each eye), 9 dexamethasone implants (700 µg each implant in both eyes) and several laser photocoagulation sessions.

He went to A&E due to a drastic loss of visual acuity in his left eye two weeks after the intravitreal dexamethasone implant and three months after injection of the antiangiogenic agent. On examination, a positive Tyndall flare was observed (corpuscles floating in the aqueous humour of the anterior chamber), hypopyon, pre-lental fibrin mesh and vitreous condensation that was observed in the opacity of the ocular media when performing optical coherence tomography (OCT) (Fig. 1A). An aqueous humour sample was obtained for culture and the patient was given an intravitreal injection of 0.1 ml of vancomycin (1 mg/0.1 ml) and 0.1 ml of ceftazidime (2 mg/0.1 ml), together with the intracameral administration of 0.1 ml of cefuroxime (1 mg/0.1 ml), on suspicion of purulent endophthalmitis. The aqueous humour was inoculated in thioglycolate broth due to the small amount of sample; it was incubated for seven days and subsequently subcultured in chocolate, Sabouraud with chloramphenicol (BD™) and *Brucella* agar plates, without obtaining growth. Oral ciprofloxacin 500 mg/12 h, 1 drop/6 h of moxifloxacin eye drops 5 mg/mL and 1 drop/2 h of dexamethasone (1 mg/mL) + tobramycin (3 mg/mL) eye drops were empirically prescribed.

As the patient showed no improvement, at 48 h a pars plana vitrectomy was performed together with a new intravitreal injection of ceftazidime and vancomycin in the same concentrations, and the patient was discharged home with the same treatment, to which oral fluconazole was added (100 mg/24 h). Samples of the vitreous humour and the vitrectomy cassette were obtained and processed for culture in the same way as the aqueous humour previously. All cultures were negative. Finally, in the remainder of both samples, 16S ribosomal DNA sequencing was performed, obtaining two sequences that were analysed in Blast<sup>R</sup> (Basic Local Alignment Search Tool). *Corynebacterium propinquum* was detected, with an identification percentage of 100%.

After vitrectomy and maintenance of systemic antibiotic therapy, the patient partially recovered his vision, coinciding with improvement in the clarity of the ocular media on the OCT and

retinography (Fig. 1B–D). In subsequent examinations, a clean vitreous was observed with a negative Tyndall.

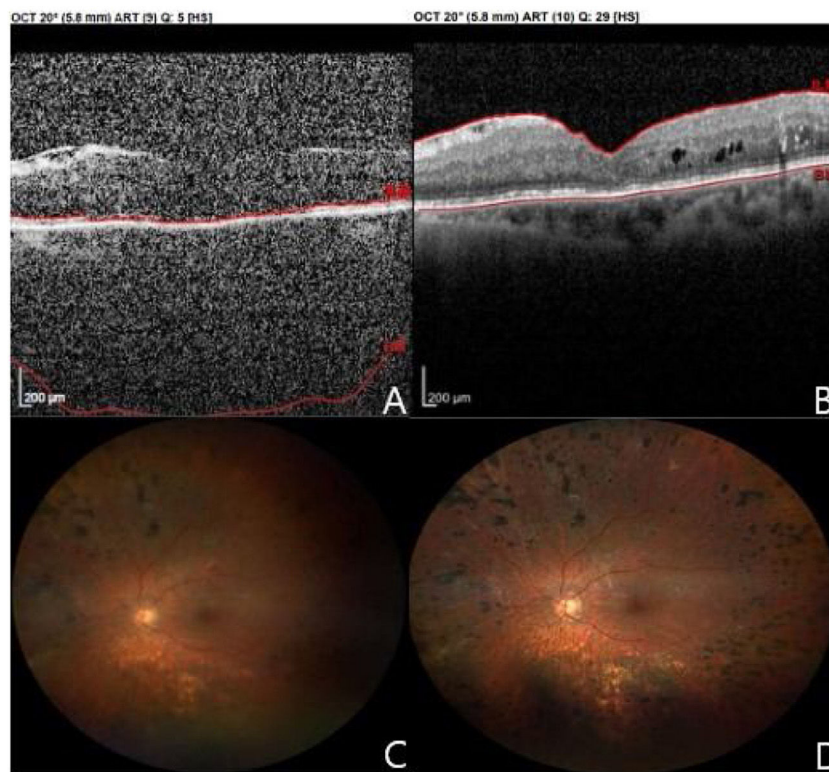
The genus *Corynebacterium* is part of the normal microbiota of the skin and mucous membranes. *C. propinquum* mainly colonises the upper respiratory tract, behaving as an opportunistic pathogen in immunosuppressed patients or those with underlying lung disease<sup>1</sup>. In recent years, although rare, it has been described as a cause of endocarditis or keratitis<sup>2,3</sup>. This is the first case of endophthalmitis reported to date.

Previous ophthalmological surgeries are one of the most important risk factors when it comes to developing endophthalmitis<sup>4</sup>. In this patient, intravitreal injections of antiangiogenic drugs and corticosteroids seem to be associated with the development of endophthalmitis compared to other cases<sup>4–6</sup>. Despite the possible risks, it has been shown that they improve the prognosis of patients with diabetic macular oedema<sup>7,8</sup>. On the other hand, both the continued use of topical antibiotics before or after the injection should be avoided, as well as excessive eyelid manipulation and the use of sterile material, a mask and povidone-iodine, which largely prevent the appearance of late endophthalmitis<sup>9</sup>.

The aetiological diagnosis is a fundamental part of this type of infection. When traditional microbiological cultures are negative, which is a common problem in ophthalmology due to the small amount of sample obtained, the diagnostic yield can be increased by inoculating samples in blood culture vials and incubating them for 7–10 days, or by using molecular techniques such as 16S rDNA sequencing<sup>10</sup>.

In most published cases, *C. propinquum* is described as sensitive to beta-lactams, aminoglycosides, vancomycin and ciprofloxacin, although occasionally with elevated MICs for vancomycin and daptomycin<sup>1,2</sup>. Its isolation in culture for the study of susceptibility to antimicrobials is essential, since it makes it possible to evaluate the efficacy and optimisation of antibiotic therapy before performing surgery. In our case, the patient's positive outcome could be due to antibiotic therapy, vitrectomy or both.

In conclusion, *C. propinquum* behaves as an opportunistic pathogen in a multitude of infections. Avoiding the continuous and prolonged use of corticosteroids, performing intravitreal injections in a sterile environment or avoiding excessive eyelid manipulation during procedures are some of the factors that could limit or prevent this type of infection. Finally, the substantial improvement in molecular techniques in recent years could be a differential fact in the microbiological diagnosis of these infections when traditional cultures do not yield results. Despite these advances, recovery of the strain in cultures is still essential in order to study antibiotic susceptibility.



**Figure 1.** Optical coherence tomography (OCT) performed at diagnosis of endophthalmitis.

A) Image of vitreous condensation. B) Image of an OCT performed two weeks after vitrectomy and after maintenance of antibiotic therapy. C and D) Two retinography images, somewhat cloudy (C) and clearer (D), performed one and two weeks after vitrectomy, respectively, in which a progressive improvement is observed with clearing of the ocular media, coinciding with improvement in the patient's visual acuity.

### Author contributions

Domingo Fernández Vecilla: wrote the scientific letter and reviewed the references.

Paula Belén Blasco Palacio: helped to write the clinical case, reviewed the references and provided the images.

Iris Sharon Pérez Ramos: reviewed the case, helped modify it and reviewed the references.

Miren Josebe Unzaga Barañano: helped with the conception of the case and use of diagnostic tools, reviewed the case and helped to modify it.

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