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Letter to the Editor

Purpureocillium lilacinum fungal keratitis: Confocal microscopy diagnosis and histopathology correlation

Queratitis fúngica por Purpureocillium lilacinum*: diagnóstico por microscopía confocal y correlación histopatológica*

Dear Editor:

Paecilomyces spp. are uncommon fungi with increased clinical relevance and resistant to usual treatment. *Purpureocillium lilacinum* (former *Paecilomyces lilacinus)* presents a special tropism for ocular structures. However, few cases have been reported worldwide.[1,2] Diagnosis is based on culture of the fungus, usually growing well in routine media. Correct identification is essential due to different antifungal resistance among species.[2]

We report a case of *P. lilacinum* keratitis with confocal and histologic findings, showing the correlation between them and the therapeutic challenge this infection poses.

A 73 years-old female with no past ocular or general history underwent an uneventful cataract surgery. 48 h after surgery, she presented with redness and pain. Best corrected visual acuity (BCVA) was 20/40 and examination revealed a whitish infiltrate as well as mild anterior chamber inflammation and iridian nodules, but no epithelial defect nor hypopion (Fig. 1A). The B scan showed no vitreous cells. Corneal scraping was performed and she was empirically treated with vancomycin (25 mg/ml), ceftazidime (50 mg/ml) and voriconazole 1% every 2 h.

Microbiological investigations yielded no results. Due to no improvement with broad-spectrum treatment, confocal microscopy was performed, revealing extensive filamentary forms consistent with a filamentous keratitis (Fig. 1B). Based on the confocal microscopy findings, a new corneal scraping was performed and treatment was subsequently combined with topical natamycin q.i.d. and systemic voriconazole (200 mg).

Microbiological investigations persisted negative. Due to the progressive clinical worsening and apparent unresponsiveness to treatment, an emergency keratoplasty was required. Analysis of the patient's cornea revealed the presence of a branched filamentous fungus with spores (Fig. 1C), being *Paecilomyces lilacinum* identified in the cultures.

After a second emergency keratoplasty due to a recurrence of the infection and four months of treatment, there was resolution of the infection and improvement of the symptoms. BCVA was 20/200 at the six months' follow-up visit.

Purpureocillium lilacinum-induced keratitis are rare, presenting a significant challenge for diagnosis and successful treatment. They cause aggressive infections, which develop resistance to multiple conventional antifungal drugs.

P. lilacinum is usually isolated from corneal cultures, with quick growth of lilac colonies in the culture. In our case, because microbiological investigations were negative and the infection worsened, confocal microscopy was performed. This noninvasive technique is of great utility in deep infiltrates not accessible to corneal scrapings and in patients on antifungal treatment, which render the anterior stroma sterile while organisms continue to be present in the deep stroma. Confocal microscopy is accurate and reliable in the diagnosis of fungal keratitis with a sensitivity and specificity of 67% and 100%, respectively.[3]

Although this technique did not determine the exact pathogen, it did provide valuable information in that the causative microorganism was a filamentous fungus, despite repeatedly negative culture results. In *P. lilacinum* the angle of fungal branching can vary from 30 degrees to 90 degrees.[1] However, their septate, nonpigmented acute branching hyphae make them indistinguishable from other species on microscopic examination. To our knowledge, only one other case after penetrating keratoplasty has described this technique in *P. lilacinum* keratitis,[4] so this is the first report in fungal keratitis of short evolution in a native cornea.

When comparing the microbiological and histopathological findings, the sensitivity and specificity are found to be 94 and 78% in fungal infections.[5] Confocal microscopy's correlation with histologic features has not been described in *Paecilomyces* spp. keratitis. In our case, both confocal microscopy and pathology revealed the

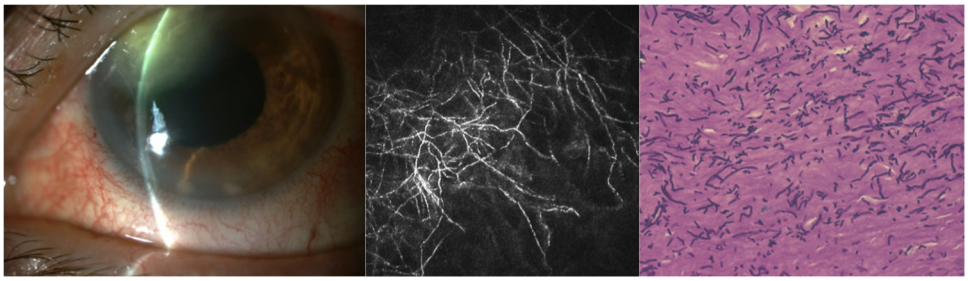

Fig. 1. (**A**) Slit lamp examination on admission, (**B**) In vivo confocal microscopy shows filamentous structures in the deep corneal stroma, (**C**) Histopathology of corneal button obtained 10 days after starting topical treatment, which shows septate hyphae overswarming the stroma.

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presence of a filamentous fungus with septate hyphae. Therefore, this the first report of a good correlation between the confocal and the pathology findings in these fungi.

Antifungal susceptibility testing should be performed because of its frequent resistance to antifungal agents. Although there is no universally accepted treatment, case reports show that the use of voriconazole or posaconazole may be the best initial approach and an effective antifungal treatment in cases poorly responsive to other therapies.[1]

In conclusion, *P. lilacinum* is a rare cause of fungal keratitis and its treatment is usually challenging, therefore early microorganism detection is necessary. We describe a *P. lilacinum*-induced keratitis diagnosed with in vivo confocal microscopy, which can be useful in cases where microbiological investigations yield no results and correlates well with histopathology findings.

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Bárbara Burgos-Blasco[a,*], José A. Gegúndez-Fernández[b], David Díaz-Valle[b]

[a] *Servicio de Oftalmología, Hospital Clínico San Carlos, Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), Madrid, Spain*
[b] *Servicio de Oftalmología, Hospital Clínico San Carlos, Departamento de Inmunología, Oftalmología y ORL, Facultad de Medicina, Universidad Complutense de Madrid, Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), Madrid, Spain*

* Corresponding author.
E-mail address: bburgos171@hotmail.com (B. Burgos-Blasco).

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