

Our findings are suggestive of a possible *in utero* SARS-CoV-2 transmission, since there is evidence of maternal SARS-CoV-2 infection during the first weeks of pregnancy, placental and fetal changes suggestive of viral infection, and a positive RT-PCR result for the detection of SARS-CoV-2 RNA from a sterile sample (amniotic fluid) during childbirth. Although the child had no clinical or neurological complications after delivery, this case reinforces the possibility of vertical transmission of SARS-CoV-2 and the need for vaccination of pregnant women against COVID-19.

Authors' contributions

All authors contributed equally to the manuscript.

Funding

The authors declare no financial support.

Conflict of interest

The authors have no competing interests to declare.

References

- Kumar P, Fadila, Prasad A, Akhtar A, Chaudhary BK, Tiwari LK, et al. Vertical transmission and clinical outcome of the neonates born to SARS-CoV-2-positive mothers: a tertiary care hospital-based observational study. *BMJ Paediatr Open*. 2021;5:e001193. Available from: <https://bmjpaedopen.bmj.com/lookup/doi/10.1136/bmjpo-2021-001193>
- Yu N, Li W, Kang Q, Xiong Z, Wang S, Lin X, et al. Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. *Lancet Infect Dis*. 2020;20:559–64. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1473309920301766>
- Knight M, Bunch K, Vousden N, Morris E, Simpson N, Gale C, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. *BMJ*. 2020;m2107. Available from: <https://www.bmj.com/lookup/doi/10.1136/bmj.m2107>
- Vivanti AJ, Vuloup-Fellous C, Prevot S, Zupan V, Suffee C, Do Cao J, et al. Transplacental transmission of SARS-CoV-2 infection. *Nat Commun*. 2020;11:3572. Available from: <http://www.nature.com/articles/s41467-020-17436-6>
- Stonoga ETS, de Almeida Lanzoni L, Rebutini PZ, Permegiani de Oliveira AL, Chiste JA, Fugaça CA, et al. Intrauterine transmission of SARS-CoV-2. *Emerg Infect Dis*. 2021;27:638–41. Available from: https://wwwnc.cdc.gov/eid/article/27/2/20-3824_article.htm
- Tolu LB, Ezeh A, Feyissa GT. Vertical transmission of severe acute respiratory syndrome coronavirus 2: a scoping review. *PLOS ONE*. 2021;16:e0250196. Available from: <https://dx.plos.org/10.1371/journal.pone.0250196>
- Pringle KG, Tadros MA, Callister RJ, Lumbers ER. The expression and localization of the human placental prorenin/renin-angiotensin system throughout pregnancy: roles in trophoblast invasion and angiogenesis? *Placenta*. 2011;32:956–62. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0143400411004802>
- Li M, Chen L, Zhang J, Xiong C, Li X. The SARS-CoV-2 receptor ACE2 expression of maternal-fetal interface and fetal organs by single-cell transcriptome study. *PLOS ONE*. 2020;15:e0230295. Available from: <https://dx.plos.org/10.1371/journal.pone.0230295>
- Edlow AG, Li JZ, Collier AY, Atyeo C, James KE, Boatman AA, et al. Assessment of maternal and neonatal SARS-CoV-2 viral load transplacental antibody transfer, and placental pathology in pregnancies during the COVID-19 pandemic. *JAMA Netw Open*. 2020;3:e2030455. Available from: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774428>
- Bronshtein M, Blazer S. Prenatal diagnosis of liver calcifications. *Obstet Gynecol*. 1995;86:739–43. Available from: <http://linkinghub.elsevier.com/retrieve/pii/002978449500278Y>

Maria Carolina Andrade Maia^a, Carolina Santos Souza Tavares^b, Cliomar Alves dos Santos^c, Paulo Ricardo Martins-Filho^{b,*}

^a Division of Gynaecology and Obstetrics, University Hospital/EBSERH, Federal University of Sergipe, Aracaju, Brazil

^b Investigative Pathology Laboratory, Federal University of Sergipe, Aracaju, Brazil

^c Health Foundation Parreiras Horta, Central Laboratory of Public Health (LACEN/SE), Sergipe State Health Secretariat, Aracaju, Brazil

* Corresponding author.

E-mail address: prmartinsfh@gmail.com (P.R. Martins-Filho).

<https://doi.org/10.1016/j.eimc.2022.01.005>

0213-005X/ © 2022 Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica. Published by Elsevier España, S.L.U. All rights reserved.

Use of the “FilmArray® blood culture identification 2” panel in a case of endophthalmitis due to *Candida parapsilosis**



Uso del panel «FilmArray® blood culture identification 2» en un caso de endofthalmitis causado por *Candida parapsilosis*

The FilmArray® (BioFire Diagnostics, Salt Lake City, UT, USA) system is a multiplex PCR that integrates sample preparation, amplification, detection and analysis. One of the available panels is the Blood Culture Identification 2 (BCID2); which allows for searching for up to 43 different targets associated with bacteraemia, including five antimicrobial resistance genes, directly from positive blood cultures. The objective of this text is to present our experience about the use of this PCR technique to help in the aetiological and therapeutic orientation in a case of endophthalmitis caused by *Candida parapsilosis* (*C. parapsilosis*).

* Please cite this article as: Fernández-Vecilla D, Pérez-Ramos IS, Aspichueta-Vivanco C, Unzaga-Barañano MJ. Uso del panel «FilmArray® blood culture identification 2» en un caso de endofthalmitis causado por *Candida parapsilosis*. *Enferm Infecc Microbiol Clin*. 2022;40:587–588.

We present the case of a 79-year-old man on anticoagulation and antiplatelet therapy with diabetes mellitus and hypertension, who underwent cataract surgery by phacoemulsification and intraocular lens implant without incident. Six months later, the patient has onset of pain, photophobia, and a slight decrease in visual acuity in that same eye. Upon examination, positive Tyndall effect, mild capsular phimosis and fibrosis, and whitish deposits are described. An ocular ultrasound is performed revealing data regarding complete retinal detachment and linear floaters similarly fixed to the optic disc suggestive of membranes residual to endophthalmitis (Fig. 1). A sample of vitreous humor (not diluted) is taken prior to infusion of saline solution, and subsequently a pars plana vitrectomy is performed. Samples are sent to the microbiology laboratory: vitreous and aqueous humor, as well as vitrectomy cassette and intraocular lens capsular bag complex. Intravitreal ceftazidime and vancomycin (1,000 mg and 500 mg diluted in 50 ml, respectively) are administered.

Upon arrival at the microbiology laboratory, the diluted aqueous and vitreous humor samples are processed by centrifugation (5 min at 3,000 rpm) and all but the last 0.5 ml of the supernatant is transferred to another tube. The sediment is resuspended in this 0.5 ml for Gram staining and culture inoculation. The samples are inoculated on chocolate agar (Becton Dickinson, Franklin Lakes, NJ, USA), Trypticase Soy Agar with 5% Sheep Blood (Bec-

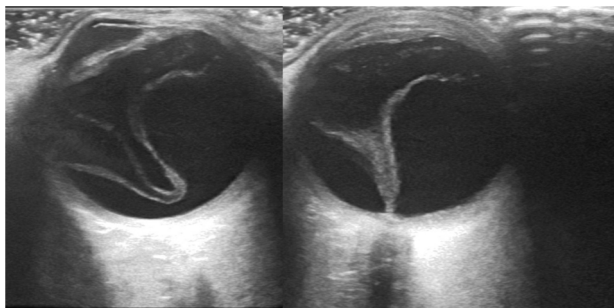


Figure 1. In the left eyeball, a linear image of V-shaped morphology fixed to the optic disc is visualised, suggestive of complete retinal detachment. In an internal location to the retina, other linear images are visualised, also fixed to the optic disc, suggestive of residual membranes of endophthalmitis.

ton Dickinson, Franklin Lakes, NJ, USA) and Sabouraud agar with chloramphenicol (Becton Dickinson, Franklin Lakes, NJ, USA), as well as in thioglycolate broth enrichment medium. Yeasts are observed in the Gram stain. At this point, 200 µl of the remaining supernatant is removed from the centrifuged vitreous humor for the performance of the FilmArray® BCID2 Panel, through which *C. parapsilosis* identified. After this result, the patient is taken to the operating room that same day for intravitreal injection of voriconazole (200 mg diluted in 20 ml). At 24 h, white colonies are observed in cultures of vitreous humor, aqueous humor, vitrectomy cassette and intraocular lens capsular bag complex, later being identified as *C. parapsilosis* by MALDI-TOF (matrix-assisted laser desorption/ionisation mass spectrometry, Bruker™). The patient is discharged from the hospital with oral fluconazole 100 mg/24 h and corticosteroids 2.5 mg/48 h, as well as tobramycin/corticosteroid 1 mg/mL and voriconazole 10 mg/mL/4 h eye drops.

The FilmArray® BCID2 panel multiplex PCR system has been extensively tested, with numerous studies demonstrating high sensitivity and specificity in positive blood culture samples.^{1,2} Its applicability to sterile samples other than blood cultures has also been studied for therapeutic guidance in both the adult and paediatric population.^{3–6} Even in the context of septic arthritis or pleural empyema, where the consistency of the sample and the high leukocyte concentration could inhibit this test, this technique could be a helpful complementary diagnostic tool.⁷

It is rare that the FilmArray® multiplex PCR system yields false negatives, but Gonzalez-Donapetry et al. presented a representative example.⁸ Following their recommendations, the melting curves and internal controls must be carefully reviewed because at times there may be alterations, the meaning of which could differ depending on the clinical context.

The FilmArray® BCID2 system has demonstrated some utility in sterile samples other than those indicated by the manufacturer, and it is a tool to consider when it is necessary to establish early antibiotic treatment in patients and complex situations, such as the case of endophthalmitis that we present. Despite this, the limitations of the technique in this type of sample must be taken into account, carrying out a prior validation, and further prospective studies that add more evidence to what has been observed up until now.

Author contributions

- Domingo Fernández Vecilla: drafted the scientific text.
- Iris Sharon Pérez Ramos: helped draft the clinical case.
- Cristina Aspichueta Vivanco: reviewed the case and helped modify it.
- Miren Josebe Unzaga Barañano: reviewed the case and helped modify it.

Funding

This text has not received funding.

Conflicts of interest

The authors declare that they have no conflicts of interest.

References

1. López-Fabal MF, Gómez-Garcés JL, López Lomba M, Ruiz Bastián M. Valoración de una técnica de PCR-múltiple en el diagnóstico rápido de la bacteriemia. *Rev Esp Quimioter.* 2018;31:263–7. Disponible en: <https://seq.es/wp-content/uploads/2018/05/lopez11may2018.pdf>
2. Altun O, Almuhayawi M, Ullberg M, Ozenci V. Clinical evaluation of the FilmArray blood culture identification panel in identification of bacteria and yeasts from positive blood culture bottles. *J Clin Microbiol.* 2013;51:4130–6. <http://dx.doi.org/10.1128/JCM.01835-13>.
3. Altun O, Almuhayawi MS, Ullberg M, Ozenci V. FilmArray: rapid ID of microorganisms from sterile body fluids. *J Clin Microbiol.* 2015;53:710–2. <http://dx.doi.org/10.1128/JCM.03434-14>.
4. Messacar K, Hamilton SL, Prinzi AM, Mitchell JC, Beil ED, Dowell EB, et al. Rapid identification of nonblood sterile site broth cultures using the FilmArray blood culture identification panel. *Diagn Microbiol Infect Dis.* 2019;93:22–3. <http://dx.doi.org/10.1016/j.diagmicrobio.2018.07.018>.
5. Micó M, Navarro F, de Miniac D, González Y, Brell A, López C, et al. Efficacy of the FilmArray blood culture identification panel for direct molecular diagnosis of infectious diseases from samples other than blood. *J Med Microbiol.* 2015;64:1481–8. <http://dx.doi.org/10.1099/jmm.0.000180>.
6. Escudero D, Forcelledo L, Leoz B, Diaz C, Balboa S, Fernández J, et al. Utilidad de la PCR-múltiple (FilmArray Blood Culture Identification) en otros líquidos biológicos. Detección de *Streptococcus pyogenes* en absceso cerebral y líquido sinovial. *Rev Esp Quimioter.* 2019;32:194–7. Disponible en: <https://seq.es/wp-content/uploads/2019/03/escudero06mar2019.pdf>
7. Michos A, Palili A, Koutouzis EI, Sandu A, Lykopoulou L, Syriopoulou VP. Detection of bacterial pathogens in synovial and pleural fluid with the FilmArray Blood Culture Identification System. *IDCases.* 2016;5:27–8. <http://dx.doi.org/10.1016/j.idcr.2016.05.006>.
8. González-Donapetry P, García-Rodríguez J, Cendejas-Bueno E. A case of a FilmArray® ME false negative in meningococcal meningitis. *J Infect.* 2019;79:277–87. <http://dx.doi.org/10.1016/j.jinf.2019.05.002>.

Domingo Fernández-Vecilla*, Iris Sharon Pérez-Ramos, Cristina Aspichueta-Vivanco, Miren Josebe Unzaga Barañano

Hospital Universitario de Basurto, Bilbao (Vizcaya), Spain

* Corresponding author.

E-mail address: domingofvec@gmail.com (D. Fernández-Vecilla).