CLINICAL CASE

1. Latin American Institute of Gynecology (ILAGINE), Lima, Peru
2. Faculty of Health Sciences, Human Medicine Program, Southern Scientific University, Lima, Peru
3. Research Unit for the Generation and Synthesis of Health Evidence, Vice-Rectorate for Research, San Ignacio de Loyola University, Lima, Peru
   a. Specialist in Gynecology and Obstetrics, ORCID: 0009-0003-5392-5840 Email: hidalgocri@gmail.com;
   b. Medical student, ORCID: 0009-0008-7672-6808, Email: 100076401@cientifica.edu.pe;
   c. Epidemiologist. ORCID: 0000-0001-8758-0463, Email: alvaro.taype.r@gmail.com

Authors' contributions:

Conceptualization: Cristian Hidalgo-Pajuelo

Formal analysis: Marcela Ramos-Pérez, Alvaro Taype-Rondan

Research: Cristian Hidalgo-Pajuelo

Methodology: Cristian Hidalgo-Pajuelo

Writing – original draft: Cristian Hidalgo-Pajuelo, Marcela Ramos-Pérez

Writing – review and editing: Alvaro Taype-Rondan

Ethical responsibilities: The authors declare that they have obtained the patient's informed consent for the reporting of this case.

Artificial intelligence: No artificial intelligence was used in this research.

Funding: Self-funded

Conflict of interest: None

Received: 18 June 2025

Accepted: 15 October 2025

Online publication: 8 December 2025

Correspondence:
Cristian Hidalgo Pajuelo
✉ hidalgocri@gmail.com

Cite as: Hidalgo-Pajuelo C, Ramos-Pérez M, Taype-Rondan A. Management of recurrent vulvovaginal candidiasis by restoring the vaginal microbiota. Rev peru ginecol obstet. 2025;71(3). DOI: https://doi.org/10.31403/rpgo.v71i2807

Approach to recurrent vulvovaginal candidiasis by restoring the vaginal microbiota

Abordaje de candidiasis vulvovaginal recurrente mediante restablecimiento de la microbiota vaginal

Cristian Hidalgo-Pajuelo[1a], Marcela Ramos-Pérez[2b], Alvaro Taype-Rondan[3c]

DOI: https://doi.org/10.31403/rpgo.v71i2807

ABSTRACT

Recurrent vulvovaginal candidiasis (RVVC) is a clinical challenge due to high recurrence and antifungal resistance. We report the case of a 29-year-old woman with over ten years of RVVC unresponsive to conventional antifungal regimens. Vaginal microbiome analysis showed severe dysbiosis, with loss of *Lactobacillus crispatus* and *jensenii*, and overgrowth of Candida albicans and Prevotella spp. A sequential therapeutic approach was applied: vaginal acidification with boric and lactic acid, recolonization with oral and vaginal probiotics (*L. crispatus, jensenii, gasseri*), antifungal dietary intervention, and psychological support. Complete symptom resolution was achieved within three months, with no subsequent recurrence. This case underscores the potential role of vaginal microbiota restoration as a complementary therapeutic strategy in refractory RVVC.

Keywords: Candidiasis, Vulvovaginal; Dysbiosis; *Lactobacillus crispatus*; Probiotics.

RESUMEN

La candidiasis vulvovaginal recurrente (CVVR) representa un desafío clínico por su alta tasa de recurrencia y resistencia a los antifúngicos convencionales. Presentamos el caso de una mujer de 29 años con más de diez años de CVVR sin respuesta sostenida a tratamientos antimicóticos. El análisis molecular del microbioma vaginal evidenció disbiosis severa, con pérdida de *Lactobacillus crispatus* y *jensenii*, y sobrecrecimiento de *Candida albicans* y *Prevotella* spp. Se instauró un tratamiento secuencial con ácido bórico y láctico, probióticos orales e intravaginales (*L. crispatus, jensenii, gasseri*), dieta antifúngica y soporte psicológico. La paciente logró remisión clínica completa a los tres meses, sin recurrencias posteriores. Este caso resalta el valor del restablecimiento de la microbiota vaginal como estrategia terapéutica complementaria en CVVR refractaria.

Palabras clave: Candidiasis Vulvovaginal, Disbiosis, *Lactobacillus crispatus*, probióticos.

Introduction

Recurrent vulvovaginal candidiasis (RVVC) constitutes a significant clinical challenge owing to its high prevalence, substantial adverse impact on quality of life, and the declining effectiveness of conventional antifungal therapies, with reported resistance rates exceeding 70%[1]. Within this framework, disruption of the vaginal microbiota has emerged as a critical factor in the persistence of infection, particularly as a result of the depletion of protective bacterial species such as Lactobacillus crispatus[2].

Nevertheless, evidence supporting therapeutic strategies aimed at the targeted restoration of the vaginal microbiota through probiotic recolonization with Lactobacillus crispatus remains limited. Although this approach represents an innovative and biologically plausible intervention, it is still infrequently described in the medical literature.

Such a strategy may be implemented through a structured, sequential protocol integrating vaginal pH modulation, administration of strain-specific probiotics, nutritional interventions, and psychological support[3,4].

We report the case of a patient with a history of refractory RVVC exceeding ten years, characterized by persistent symptoms—including clumpy vaginal discharge, dysuria, dyspareunia, and severe pruritus—and a lack of sustained response to multiple antifungal regimens. The patient was successfully managed using this sequential therapeutic approach.

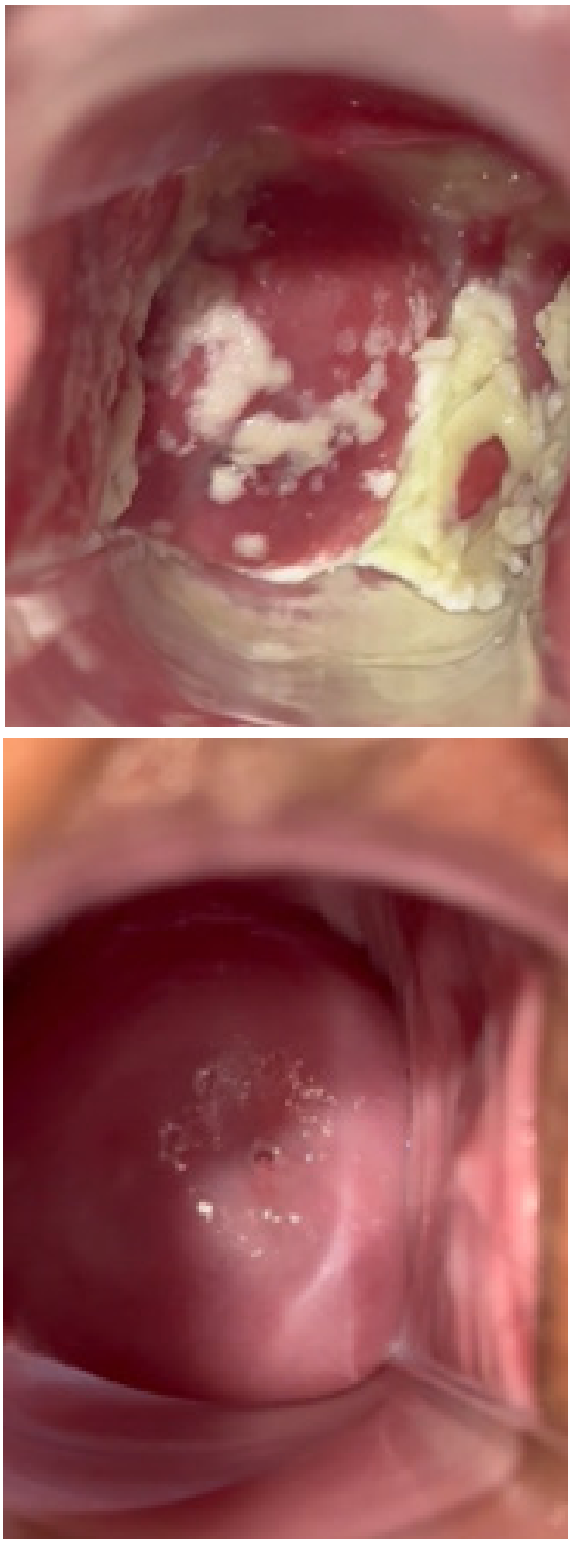
This case provides direct clinical evidence supporting the effectiveness of vaginal microbiota restoration as a therapeutic strategy in resistant RVVC. It underscores its potential utility in contexts of persistent recurrence associated with microbial dysregulation and suggests that microbiota recovery may represent a viable alternative to conventional antifungal therapies. Written informed consent was obtained from the patient for the publication of this case.

Case report

We report the case of a 29-year-old Ecuadorian woman with a history of recurrent vulvovaginal candidiasis (RVVC) spanning more than ten years. She presented to the Latin American Institute of Gynecology (ILAGINE) in Lima, Peru, in December 2024 with complaints of clumpy white vaginal discharge, severe vulvar pruritus, dysuria, lower pelvic pain, and a persistent vaginal burning sensation. Her relevant medical history included recurrent urinary tract infections occurring three to four times per year over the past decade, as well as an upper endoscopic diagnosis made in March 2024 of a 1.8-cm hiatal hernia and mild erosive gastritis. Additionally, she reported a maternal history of recurrent vaginal infections, human papillomavirus (HPV) infection, and cervical cancer.

Despite multiple intermittent courses of topical and systemic antifungal therapy initiated in late July 2023—including fluconazole, itraconazole, and clotrimazole, prescribed in response to positive vaginal secretion cultures for Candida spp.—as well as antibiotic treatment with nitrofurantoin for approximately eight months due to recurrent positive urine cultures for *Escherichia coli* and *Klebsiella pneumoniae*, the patient failed to achieve sustained clinical remission. In March 2024, her antifungal regimen was modified to

Figure 1. Clinical examination of the patient's cervix. A) Entrance examination B) Examination three months after treatment



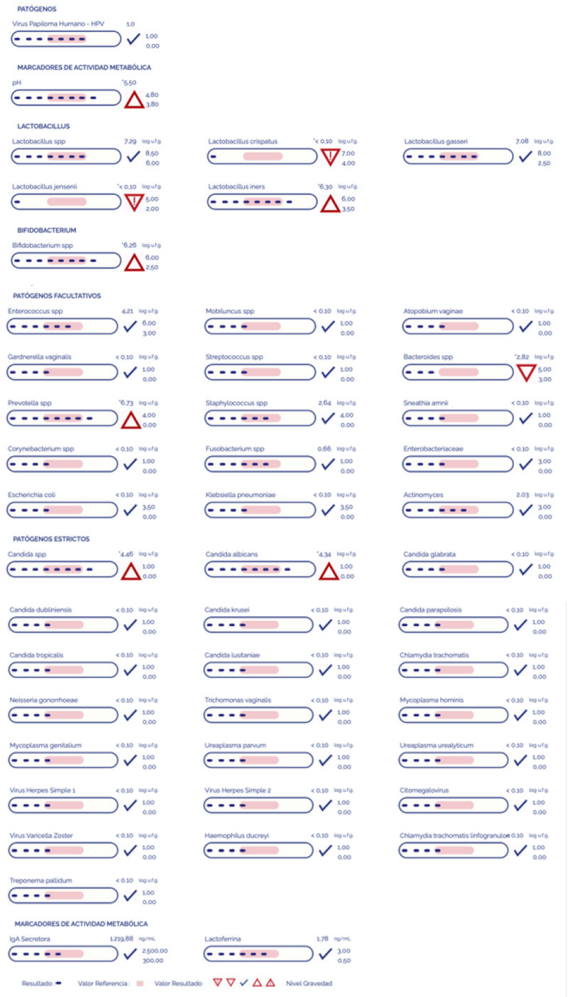
itraconazole, accompanied by prolonged courses of oral probiotics; however, these interventions likewise did not result in durable symptom resolution.

Clinical examination revealed an erythematous vulva with excoriations and thick discharge adhering to the cervix (Figure 1A).

Diagnostic tests

In December 2024, her vaginal microbiome was analyzed using swabs sent to the Pronacera laboratory (SINAE group, Spain). DNA was extracted using the ReliaPrep Blood gDNA Miniprep kit (Promega) and evaluated by spectrophotometry (Multiskan SkyHigh, Thermo Fisher). Preamplification was performed with Preamp reagent and TaqMan assays (Standard BioTools) in a T100 thermocycler (Bio-Rad). Finally, it was analyzed by microfluidic RT-PCR on the Biomark X platform, using specific probes for 39 clinically relevant microorganisms. (Figure 2) in which pH 5.5, *Lactobacillus Spp* 7.29 (VN 8.5 – 6.0), *Lactobacillus crispatus* < 0.10 (VN 7.0 – 4.0), *Lactobacillus gasseri* 7.08 (VN 8.0 – 2.5), *Lactobacillus jensenii* < 0.10 (VN 5.0 – 2.0), *Lactobacillus iners* 6.30 (VN 6.0 – 3.5), *Bifidobacterium* 6.26 (VN 6.0 – 2.5), *Prevotella* 6.73 (VN 4.0 – 0.0), *Bacteroides* 2.82 (VN 5.0 – 3.0), *Candida Spp* 4.46 (VN 1.0 – 0.0), and *Candida albicans* 4.34 (VN 1.0 – 0.0).

Figure 2. Results: pathogens, types of *Lactobacillus* and Bifidobacterium, and facultative pathogens.



Diagnosis

Candida albicans was found, along with an increase in *Prevotella* and a decrease in *Lactobacillus crispatus* and *jensenii*, with an increase in *Lactobacillus iners*. The patient was diagnosed with vaginal dysbiosis: *Lactobacillus* deficiency and mixed infection (*Candida albicans* and *Prevotella*) (Figure 2).

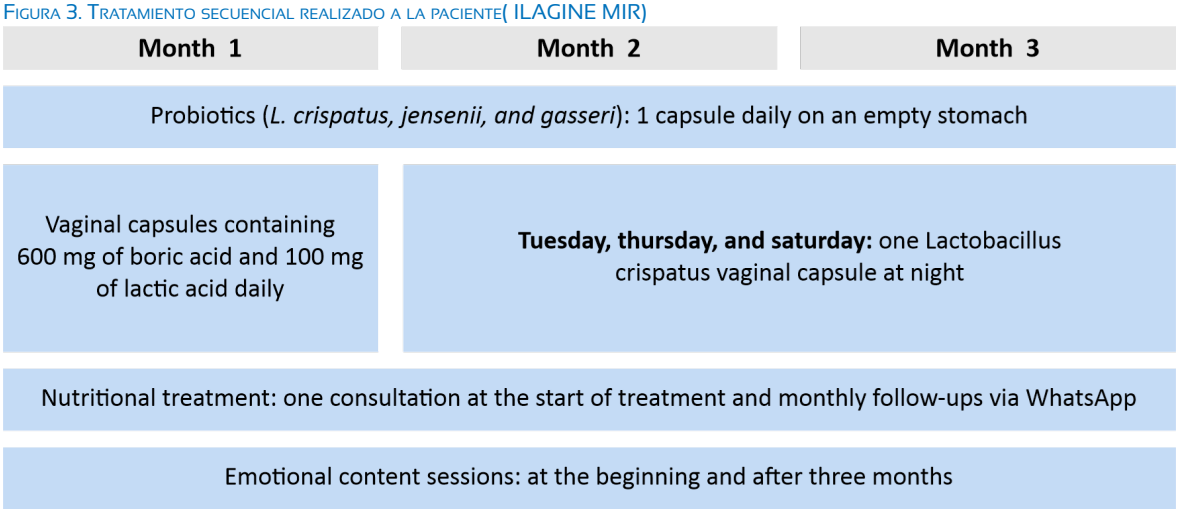
Treatment details

In January 2025, a sequential therapeutic approach developed at the Latin American Institute of Gynecology (ILAGINE) called ILAGINE MiR (Microbiome Restore) was initiated (see Figure 3). The treatment lasted a total of three months. Throughout the period, oral probiotics in capsules containing *Lactobacillus crispatus*, *L. jensenii*, and *L. gasseri* were administered once a day to promote the recolonization of the intestinal microbiota.

In the first month, the patient received vaginal capsules containing boric acid (600 mg) and lactic acid (100 mg) daily, with the aim of restoring the vaginal pH and creating an optimal environment for the growth of *Lactobacillus*[5]. During the following two months, an intermittent treatment was carried out consisting of: probiotic vaginal capsules (*L. crispatus* JYLQ-33, 5.4 million freeze-dried Lactobacillus) once a night 3 times a week, and vaginal capsules with boric acid (600 mg) and lactic acid (100 mg) three times a week[6].

In addition, a comprehensive dietary intervention was implemented, consisting of the complete restriction of refined sugars, sweeteners, refined oils, unfermented dairy products, and gluten. The nutritional plan emphasized regular intake of foods rich in prebiotic fiber and probiotic microorganisms, supplementation with one

Figura 3. Tratamiento secuencial realizado a la paciente(ILAGINE MIR)



tablespoon of coconut oil before each meal, and administration of five drops of oregano oil each morning for a period of three months. This dietary strategy was informed by evidence indicating that the proliferation of Candida spp. is enhanced by increased availability of glucose and fructose within the intestinal milieu[7].

Furthermore, the patient engaged in structured emotional support sessions based on inner child therapy, with the objective of improving stress management and emotional regulation. This component of the intervention was supported by studies demonstrating an association between elevated cortisol levels, immunosuppression, and increased glucose availability—conditions that may facilitate the growth of Candida spp.[8].

Outcomes

The patient reported full adherence to treatment and experienced no adverse effects during its administration. Clinical progress was favorable, with progressive improvement and symptomatic stability. At the end of treatment, she was asymptomatic and in complete clinical remission. In the follow-up evaluation performed in June 2025 (three months after the end of treatment), there was no evidence of clinical recurrence or signs of infection (Figure 1B); for this reason, it was not considered necessary to repeat the RT-PCR test.

Discussion

Recurrent vulvovaginal candidiasis is a highly prevalent clinical condition associated with suboptimal therapeutic outcomes, particularly when management relies exclusively on antifungal agents. In recent years, increasing evidence has highlighted the critical role of the female genital tract microbiota and its close interplay with local immune responses and vaginal homeostasis[9,10]. The present clinical case is consistent with this evolving perspective, demonstrating that conventional azole-based therapies, even when administered in prolonged regimens, were insufficient to achieve sustained clinical remission. This observation supports findings from prior studies indicating that the mere eradication of Candida spp. is inadequate to prevent disease recurrence[11,12].

Our study showed a vaginal microbiota dominated by Lactobacillus iners and L. gasseri, species that offer little protection and are associated with bacterial vaginosis, accompanied by overgrowth of Candida albicans, Prevotella spp., and an altered vaginal pH(5.5). These findings are consistent with those described by Macklaim et al. (2011), who reported that L. iners has a smaller genome and lacks key genes for the production of lactic acid and hydrogen peroxide, which favors greater susceptibility to infections. In addition, Poon and Hui (2023) demonstrated that strains of Lactobacillus such as L. crispatus and

L. rhamnosus have direct inhibitory effects on biofilm formation and filamentation of Candida albicans and other pathogenic species, a strategy absent in our patient, who had a Lactobacillus crispatus deficiency[11].

The fact that the patient did not respond to previous antifungal treatments, including fluconazole and itraconazole, can be explained pathophysiologically by biofilm formation, induced resistance, and persistent dysbiosis, phenomena also described in recent meta-analyses on *Candida spp*. and their capacity for systemic invasion. In this regard, the use of boric acid as a vaginal acidification strategy has proven effective against resistant strains such as C. glabrata and was historically validated by Sobel and Chaim (1997)[14], which justifies its initial use in the sequential strategy in this case.

On the other hand, the restoration of vaginal microbiota using multistrain probiotics (oral and intravaginal) finds experimental support in studies such as that by Borges et al. (2014), where it was observed that L. crispatus and L. rhamnosus increase the production of anti-inflammatory cytokines and enhance epithelial mucosal defense[15]. This is complemented by recent findings by Wang et al. (2024), who pointed out that modulation of the vaginal microbiota not only reduces the fungal load but also stabilizes the immune response in the vaginal mucosa, thus decreasing the risk of recurrence. Unlike many trials that used only a single strain, our intervention included a combined strategy with psychological support and an established diet, which may have enhanced the clinical efficacy observed.

Likewise, the study by Rosati et al. (2025) confirms that lactic acid produced by Lactobacillus in a state of eubiosis plays an important immunomodulatory role by reducing inflammation and modulating the fungus-host interaction[17]. This coincides with the therapeutic model described here, where pH rebalancing and the reintroduction of specific probiotic strains contributed to complete remission of symptoms.

At the immunological level, studies such as those by Conti and Gaffen (2010) indicate that dysbiosis and low IL-17 production are associated with increased susceptibility to mucocutaneous candidiasis, as mucosal Th17 responses are not adequately activated[18].

One limitation of this case was the absence of a control RT-PCR after treatment, which would have confirmed the restoration of the microbiota at the molecular level. However, complete and sustained clinical remission for three months, the absence of recurrences, and comprehensive therapeutic adherence support the effectiveness of the strategy. This integrative approach is consistent with the proposal by Zuñiga Vinueza (2024), who suggests that probiotics should be incorporated as part of standard preventive management in women with a history of recurrent vaginal infections[19].

In conclusion, this clinical case underscores the need to reconceptualize recurrent vulvovaginal candidiasis as a disorder of vaginal microbiota dysbiosis rather than solely as a recurrent infectious process. Comparison of our findings with those reported in related studies suggests that therapeutic success is more likely when management strategies prioritize restoration of vaginal microbiota balance, incorporate individualized interventions, and employ molecular diagnostic tools to guide treatment beyond the conventional antifungal paradigm.

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