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Case report

Unusual localization of Rothia kristinae infection: First report of an intracerebral abscess in a pediatric patient
Localización inusual de infección por Rothia kristinae: primer reporte de absceso intracerebral en paciente pediátrico

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Abstract
Introduction: This case describes a rare pediatric intracerebral infection caused by *Rothia kristinae*, an uncommon pathogen not typically associated with brain abscesses. Its novelty lies in the unexpected etiology and clinical evolution, underscoring diagnostic and therapeutic challenges in resource-limited settings. **Case:** A 9-year-old girl presented with persistent headache, vomiting, visual disturbances, and bradycardia. Neurological imaging revealed a posterior fossa lesion. Neurosurgical intervention was performed to drain the lesion, and microbiological analysis confirmed *Rothia kristinae* from abscess culture. Empirical antibiotic therapy with ceftriaxone, vancomycin, and metronidazole was initiated. Surgical drainage and antimicrobial treatment led to clinical improvement. The patient developed posttreatment thrombocytopenia, managed with corticosteroids, with full resolution of symptoms. **Conclusions:** This case highlights the importance of considering atypical pathogens in pediatric neuroinfections and demonstrates the effectiveness of early surgical and antimicrobial management.

Keywords: Gram-Positive Cocci; Central Nervous System Bacterial Infections; Central Nervous System Infections; Child.

Resumen
Introducción: Se presenta un caso inusual de neuroinfección pediátrica causada por *Rothia kristinae*, un patógeno raramente implicado en abscesos cerebrales. Su relevancia clínica radica en la etiología poco común, la evolución progresiva del cuadro clínico y los desafíos diagnósticos en contextos con recursos limitados. **Presentación del caso:** Paciente femenina de 9 años, previamente sana, quien ingresó por cuadro de seis semanas de evolución con cefalea intensa, vómitos persistentes, visión borrosa en ojo izquierdo y bradicardia. La resonancia magnética cerebral evidenció una lesión en fosa posterior con refuerzo leptomeníngeo y edema vasogénico. Ante la sospecha de absceso cerebral, se realizó craneotomía para drenaje y reparación de fístula de líquido cefalorraquídeo. El cultivo del material purulento identificó *Rothia kristinae* como agente etiológico. Se inició tratamiento antibiótico empírico con ceftriaxona, vancomicina y metronidazol, con evolución clínica satisfactoria. La paciente desarrolló trombocitopenia posterior, manejada exitosamente con esteroides. Completó 4 semanas de tratamiento, con resolución total de los síntomas y sin secuelas neurológicas. **Conclusiones:** Este caso destaca la necesidad de considerar etiologías infecciosas inusuales en pacientes pediátricos con síntomas neurológicos progresivos. La intervención quirúrgica oportuna, junto con terapia antimicrobiana empírica, fue clave para el desenlace favorable.

Palabras clave: Cocos Grampositivos; Infecciones Bacterianas del Sistema Nervioso Central; Infecciones del Sistema Nervioso Central; Niño.

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INTRODUCTION

Rothia kristinae is a Gram-positive, catalase-positive, coagulase-negative coccus from the Micrococcaceae family [1]. Although commonly regarded as a commensal organism colonizing human skin, oropharynx, and upper respiratory tract, recent case reports have identified R. kristinae as an emerging opportunistic pathogen with the capacity to cause bacteremia, endocarditis, catheter-related infections [1,2,3], and, in rare cases, central nervous system (CNS) involvement. Its phenotypic similarity to coagulase-negative staphylococci and misclassification in earlier taxonomic systems have contributed to diagnostic under-recognition [2,3]. Notably, the organism was originally classified as Kocuria kristinae and only recently reclassified to the genus Rothia based on 16S rRNA sequencing and chemotaxonomic features [4].

Despite increasing documentation of Rothia species as causative agents in extracardiac infections, including pneumonia, endophthalmitis, and osteoarticular infections [2,3], cases of intracerebral abscess due to R. kristinae remain exceedingly rare, with no clear therapeutic guidelines and limited clinical data [4]. Most published infections are reported in immunocompromised patients, particularly those undergoing chemotherapy or hemodialysis [2]. In contrast, the pathogenesis and clinical course of Rothiarelated CNS infections in immunocompetent pediatric patients are virtually undocumented. Moreover, a recent systematic review showed that antimicrobial susceptibility testing for Rothia spp. remains inconsistent, with no established breakpoints by Clinical and Laboratory Standards Institute (CLSI), complicating clinical decision-making [2].

Given the lack of evidence surrounding pediatric CNS infections caused by Rothia kristinae, we report the first known case of an intracerebral abscess due to this pathogen in a previously healthy child. Our aim is to describe the clinical presentation, imaging findings, surgical and pharmacological management, and hematological evolution in this patient. This case report was prepared in accordance with the CARE guidelines to ensure clarity, transparency, and reproducibility in clinical case reporting [5].

CASE REPORT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

We report the case of a previously healthy 9-year-old school-aged girl who was admitted to Clínica Santa Ana de Dios in Barranquilla, Colombia, on March 19, 2025, due to a six-week history of persistent headache, recurrent vomiting, blurred vision in the left eye, and episodes of reflex bradycardia. The patient had previously visited other healthcare institutions, where she was treated empirically with analgesics and antipyretics, which provided only partial and transient improvement. During

April, her symptoms worsened, with more frequent vomiting, intensifying headache, and progressive neurological deterioration.

On clinical evaluation, left eye proptosis was noted. A contrast-enhanced brain magnetic resonance imaging (MRI) revealed a right cerebellar inflammatory lesion with focal leptomeningeal enhancement and associated vasogenic edema, suggestive of a posterior fossa abscess (Figure 1). Based on these findings, the neurosurgery team performed a decompressive craniotomy and surgical drainage of the lesion on May 8, 2025. During the same procedure, a cerebrospinal fluid (CSF) fistula was identified and repaired. The purulent material obtained intraoperatively was sent for microbiological culture, which confirmed Rothia kristinae, a Gram-positive coccus that is part of the commensal flora and rarely associated with intracranial infections.

As there are no established CLSI breakpoints for Rothia kristinae, empirical antimicrobial therapy was initiated with ceftriaxone (1.1 g/12 hours), vancomycin (330 mg/6 hours), and metronidazole (220 mg/6 hours). The patient's clinical status improved progressively following surgery and antibiotic initiation. However, during follow-up, she developed thrombocytopenia, with a platelet count dropping to 99,000/ mm^3 (Table 1). Immunological disorders were ruled out as the underlying cause. Corticosteroid therapy was introduced, leading to hematological recovery.

The patient completed a four-week course of intravenous antibiotic therapy, with continuous monitoring of clinical and laboratory parameters. She was discharged with full resolution of neurological symptoms and no residual hematological abnormalities.

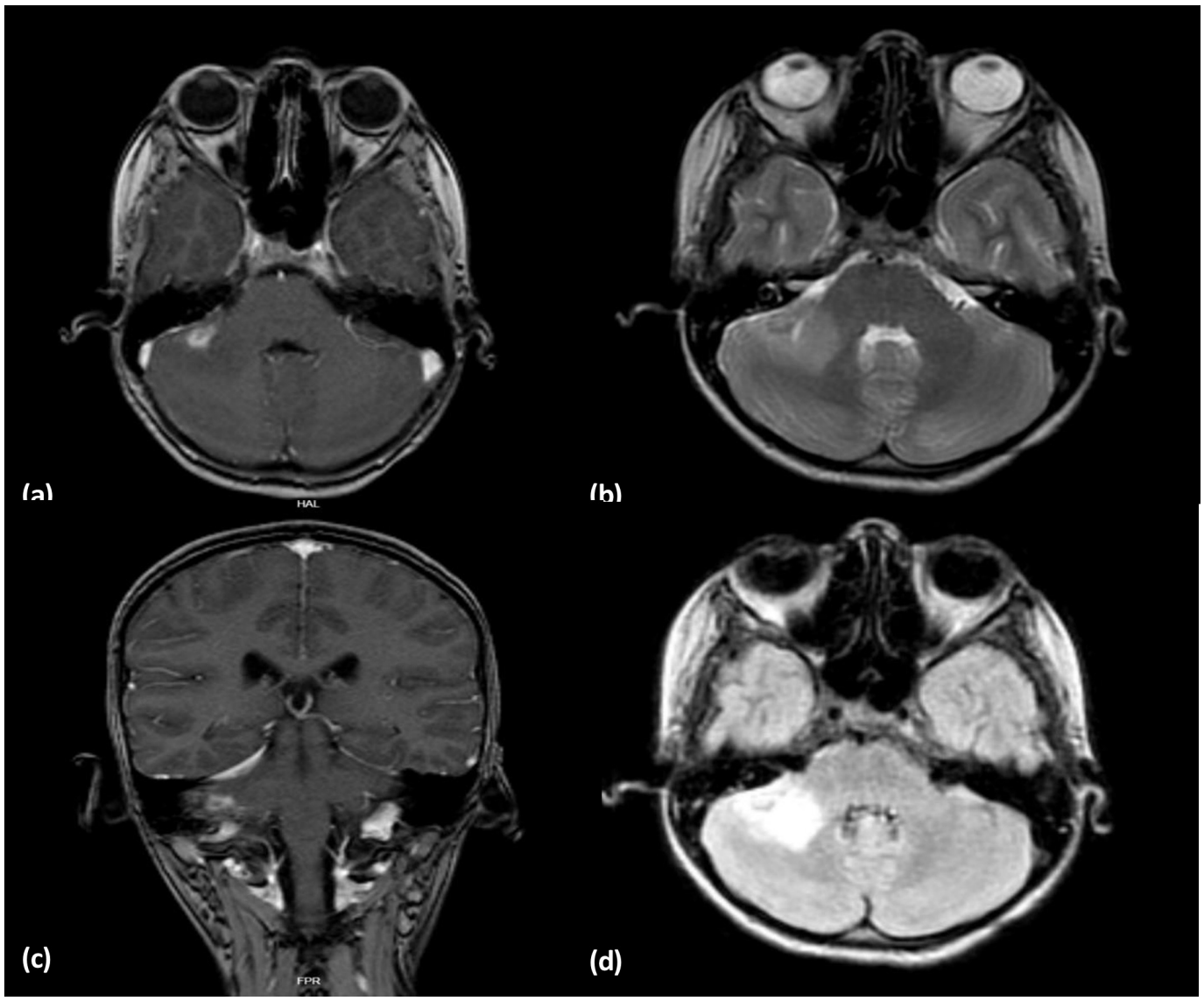

Figure 1. Brain MRI findings at admission. (A) Axial T1-weighted post-contrast image showing focal leptomeningeal enhancement and space-occupying lesion in the right cerebellar hemisphere. (B) Axial T2-weighted sequence demonstrating hyperintensity in the posterior fossa. (C) Coronal T1-weighted postcontrast image highlighting enhancement in the right cerebellar region and mild compression of the fourth ventricle. (D) Axial FLAIR sequence showing vasogenic edema surrounding the cerebellar lesion.

DISCUSSION

This report describes, to the best of our knowledge, the first documented case of a intracerebral abscess caused by Rothia kristinae in a previously healthy pediatric patient. Although R. kristinae is generally considered a low-virulence commensal, recent reports suggest that under certain conditions, such as barrier disruption, localized immunological imbalance, or mucosal invasion [2,6,7], it can act as a pathogen capable of causing severe infections, particularly in immunocompromised hosts [2,3]. The occurrence of a CNS infection in an immunocompetent child, as presented in this case, challenges the traditionally held notion that Rothia kristinae lacks invasive potential in healthy individuals.

Table 1. Comparative evolution of hematological and inflammatory parameters from intensive care admission to recovery.

Parameter	May 5, 2025 (Intensive care admission)	May 30, 2025 (Post-surgery follow-up)	June 3, 2025 (Recovery phase)
White Blood Cell Count	12.25 × 10^9/L (↑) (Ref: 4.5–10)	8.05 × 10^9/L (normal)	16.33 × 10^9/L (↑)
Neutrophils	10.02 × 10^9/L (↑) (Ref: 2–7.5)	5.01 × 10^9/L (normal)	12.60 × 10^9/L (↑)
Lymphocytes	1.73 × 10^9/L (Ref: 1–4)	2.54 × 10^9/L	3.41 × 10^9/L
Platelet Count	311 × 10^9/L (normal) (Ref: 150–450)	99 × 10^9/L (↓)	237 × 10^9/L (recovered)
Hemoglobin	12.8 g/dL (Ref: 12–16)	13.4 g/dL	13.9 g/dL
C-Reactive Protein	1.48 mg/L (Ref: 0–6)	—	0.00 mg/L (normal)
Neutrophil	81.8% (↑) (Ref: 50–67)	62.1% (normal)	77.2% (↑)
Lymphocytes	14.1% (↓) (Ref: 27–40)	31.6% (normal)	20.9% (↓)
Mean Corpuscular Volume	76.8 fL (↓) (Ref: 80–98)	78.5 fL (↓)	79.0 fL (↓)
Plateletcrit	3.300%	1.090%	2.300%

The case also illustrates a critical diagnostic challenge. Rothia spp. can be easily misclassified due to their morphological similarity to coagulase-negative staphylococci or other Gram-positive cocci, especially in facilities without access to molecular identification tools [6,7,8,9]. Moreover, R. kristinae was historically grouped under the genus Kocuria, further contributing to misidentification and underreporting [6,7,8,9]. The consistent isolation of R. kristinae from intracerebral abscess fluid in our case, coupled with the absence of other organisms and a corresponding clinical response to antimicrobial therapy, supports its role as a true pathogen rather than a contaminant [9].

From a microbiological perspective, the absence of established breakpoints by CLSI for R. kristinae presents therapeutic uncertainty [10]. However, susceptibility studies have demonstrated that Rothia spp. are generally sensitive to beta-lactams, vancomycin, and rifampin, while often showing resistance to macrolides and clindamycin [2]. In our case, the empirical use of ceftriaxone, vancomycin, and metronidazole proved effective, which aligns with prior reports of successful treatment of Rothia infections using beta-lactam-based regimens.

Importantly, the patient developed transient thrombocytopenia during the antibiotic course, which was managed with corticosteroids. This hematological adverse event has not been previously associated with R. kristinae infections [2,4] and may represent a drug-related immune-mediated reaction or a delayed post-infectious complication [2,4]. This underscores the importance of close hematological monitoring during prolonged antimicrobial therapy, even when the primary infection is resolving.

The timely use of MRI played a critical role in early detection of the cerebellar lesion and guided surgical planning. The presence of leptomeningeal enhancement and vasogenic edema raised concern for a spaceoccupying lesion with infectious characteristics. Neurosurgical drainage remains the cornerstone of management

in intracerebral abscesses [11], particularly in posterior fossa lesions where mass effect can rapidly compromise vital brainstem structures [11].

From a broader perspective, this case expands the known clinical spectrum of R. kristinae, previously reported mainly in bacteremia, catheter-associated infections, and endocarditis [1,2,3,4]. Our findings suggest that R. kristinae should not be disregarded when isolated from sterile CNS sites, even in immunocompetent pediatric patients, especially when clinical and radiological findings are consistent with an invasive process.

This case contributes to the scientific community by exemplifying how rare clinical observations can generate novel insights that challenge existing assumptions and expand the empirical knowledge base [12,13,14]. From a meta-scientific perspective, it highlights the importance of case reports as foundational units of clinical evidence [12,13,14], particularly in identifying underrecognized pathogens such as Rothia kristinae in unexpected anatomical sites. Moreover, it addresses a theoretical gap by suggesting that commensal organisms may behave as opportunistic neurotropic pathogens even in immunocompetent hosts. Thus, this report serves not only to inform clinical practice but also to advance hypothesis generation and guide future observational and mechanistic studies aimed at closing empirical and conceptual gaps in infectious disease research [12,13,14,15].

Limitations

This is a single-case report, and conclusions about causality or generalizability are limited. No molecular or genomic analysis of the strain was performed, which would have provided further insights into its virulence profile. Additionally, immunological screening to rule out subclinical primary immunodeficiencies was not performed due to resource limitations.

CONCLUSIONS

This case highlights the pathogenic potential of Rothia kristinae in CNS infections and underlines the importance of surgical intervention, empirical broad-spectrum antimicrobial therapy, and careful hematological follow-up. Awareness of this rare but potentially serious presentation is essential for clinicians facing similar neurological scenarios, particularly when initial treatments fail or when unusual pathogens are recovered from sterile sites.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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None

ETHICS STATEMENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

DATA, MATERIALS, AND CODE AVAILABILITY

Not applicable.

CONTRIBUTOR ROLES

Bianis Massiel Orozco Ariza: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. Silvia Juliana Buitrago Lizarazo: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. Marilyn Julieth Antequera Ochoa: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. Laura Johana Ortiz Brito: Conceptualization, Investigation, Writing – original draft, Writing – review & editing.

AI USAGE DISCLOSURE

The authors declare that they have not used artificial intelligence in the writing of this manuscript.

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