

Case Report

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A Rare Threat: Navigating the Complex Diagnosis of Paediatric Retropharyngeal Abscess

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Abstract

The retropharyngeal abscess (RPA) is an uncommon and potentially fatal infection of the deep spaces in the neck. The global incidence is unknown, but it has been reported to be more common in children between six months and six years. The clinical manifestations are unspecified and exhibit a different disease etiology from those in adults. The imaging studies are useful to reveal details of the severity of the illness and its complications. Treatment options include conservative therapies or surgery. We presented the difficult diagnostic case of a 6-month-old male infant with nonspecific symptoms, and an imaging study that showed a RPA that did not respond to initial antibiotic therapy. Knowledge of clinical manifestations, primary diagnosis tools, and timely treatment of this entity is crucial to avoiding life-threatening complications, especially in infants, given the diagnostic challenge posed by the difficulty of identifying symptoms in this population.

Keywords: Retropharyngeal abscess, child, anti-bacterial agents, drug resistance

Introduction

A retropharyngeal abscess (RPA) is a rare and life-threatening infection of the deep neck spaces^{1,2}. Little is known about their global incidence in the paediatric population. However, it has been reported to be more common in children between six months and six years than it is in the adolescent population³. Novis et al.⁴ studied

the incidence of deep neck infections (DNI) in paediatric populations in the United States from 2000 to 2009 and found that RPA increased from 0.10 cases per 10,000 in 2000 to 0.22 in 2009. The cause of this phenomenon is associated with a change in normal oropharyngeal flora due to drug-resistant bacterial strains¹.

The first clinical manifestations of DNI include prodromal illness with upper respiratory symptoms with or without



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fever, and signs and symptoms secondary to neck structure involvement, such as neck swelling and pain, limited neck motion, poor appetite, trismus, stridor, and respiratory distress^{1,3}. The children deserve special attention because the symptoms are unspecified, which have a different disease aetiology than in adults¹.

The diagnosis is based on clinical manifestations and imaging studies such as ultrasound, computed tomography (CT), and magnetic resonance imaging, which can reveal details on the severity of the illness and its complications⁵. Additionally, abscess cultures are strongly recommended to determine the aetiology. The treatment strategy should focus on the specific patient; sometimes, this requires surgical therapy or a conservative approach with antibiotics⁶.

In the past, these pathologies had a negative prognosis, but advances in imaging, surgical techniques, and the availability of broad-spectrum antibiotics improved the prognosis⁷. We presented the difficult diagnostic and therapeutic case of a 6-month-old male infant with nonspecific symptoms and an imaging study that showed a RPA that did not respond to initial antibiotic therapy.

Case Presentation

A 6-month-old male infant with no prior medical issues presented to the emergency room with a 39 °C fever, inappetence, and mother-reported abdominal pain over the past two days. He was treated with antipyretics, without resolution. On presentation, the vital signs showed a heart rate of 129 beats per minute, a respiratory rate of 18 breaths per minute, a temperature of 42 °C, and a weight of 7620 g. The initial physical examination showed grade I dehydration, and irritation. Subsequently, he was evaluated by a paediatrician, and the vital signs showed a heart rate of 152 beats per minute, a respiratory rate of 25 breaths per minute, an oxygen saturation of 98% in room air, a temperature of 38.5 °C, and a new physical examination indicated moderate dehydration, irritability, and cervical rigidity.

Initial laboratory tests showed an elevated white blood cell count [27,160/mL, normal range (NR): 6,000-17,500/mL], neutrophilia (69.1%), lymphopenia (19.9%), and thrombocytosis (621,000/mL, NR: 150,000-450,000/mL), with a red blood cell count in the lower limit (haemoglobin: 11 g/dL, NR: 10.1-12.9 g/dL, haematocrit: 32.9%, NR: 34-40%), an elevated C-reactive protein (48 mg/L, NR: <0.3 mg/L), an elevated procalcitonin (1.99 ng/mL, NR: <0.1 ng/mL), a normal random glucose test (137.1 mg/dL, NR: <200 mg/dL), and normal electrolytes (chloride: 105.3 mmol/L, NR: 96-106 mmol/L, sodium: 140.8 mmol/L, NR: 135-145 mmol/L, potassium: 4.71, NR: 3.5-4.5 mmol/L). Initial imaging studies with chest radiography, abdominal ultrasonography, and head CT were within normal limits.

The medical team suspected a neuroinfection and started treatment with ceftriaxone 100 mg/kg/day, vancomycin 60 mg/kg/day, and acyclovir 60 mg/kg/day. The cerebrospinal fluid analysis was normal, and the cerebrospinal fluid culture, two blood cultures, and

film array were negative. The urine culture reported polymicrobial growth.

Subsequently, the physical examination revealed pain from cervical mobilisation. For this reason, the paediatrician asked for a neck CT with contrast, which showed a RPA measuring 20x10x18 mm that discreetly displaces the airway and has a slightly peripheral enhancement. Additionally, it showed reactive-looking lymph nodes (**Figure 1**). The paediatrician suspended the acyclovir treatment, and he underwent an otorhinolaryngology evaluation, which required a follow-up neck CT to evaluate the antibiotic response and the need for a surgical procedure.

During hospitalisation, the patient had persistent fever despite medical management, and the laboratory control reported a leukocyte count (36,200/mL, NR: 6,000-17,500/mL), neutrophilia (54.5%), mild anaemia (haemoglobin: 10.1 g/dL, NR: 10.1-12.9 g/dL, haematocrit: 30.1%, NR: 34-40%), thrombocytosis (745,000/mL, NR: 150,000-450,000/mL), and C-reactive protein (24 mg/L, NR: <0.3 mg/L). The infectologist evaluated the patient and decided to change the antibiotic treatment from ceftriaxone to meropenem and continue with vancomycin and clindamycin. Considering these findings and the worsening of clinical and paraclinical status, the medical team decided that surgical treatment was necessary, and the patient was referred to a higher-level hospital.

Consent was obtained from the patient's mother, in accordance with institutional ethical guidelines, prior to the inclusion of the infant in the case report.

Discussion

The nonspecific clinical manifestations of RPA can pose challenges for practitioners because this condition may mimic other diseases, such as meningitis, epiglottitis, and foreign body aspiration⁸. Our case illustrated that problem, first due to the early age of the patient with limited communication skills and, second, because of the clinical manifestations that led to the suspicion of a neuroinfection. The medical team's expertise in suspecting this condition in a child with prolonged fever

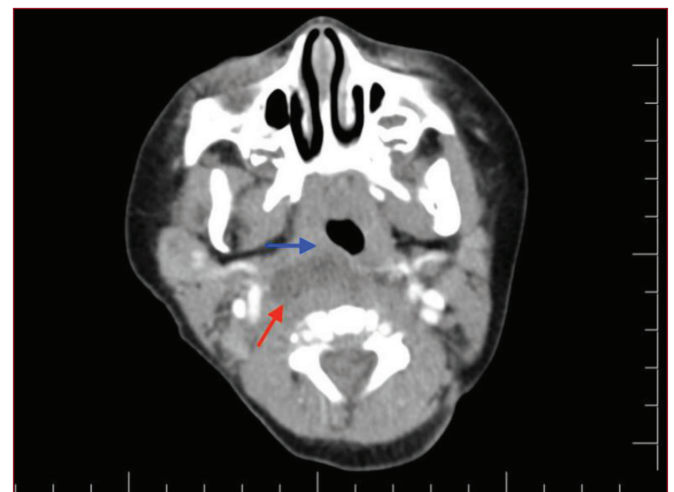


Figure 1. Axial slice of a neck CT scan showing a retropharyngeal abscess (red arrow) and a slight displacement of the airway (blue arrow)

CT: Computed tomography

and altered laboratory test results enabled the unusual diagnosis⁹.

Some authors suggest that alarming signs to consider for RPA are odynophagia, cervical pain, dyspnoea, stridor, trismus, cervical rigidity, and febrile syndrome⁷. In an infant, some of these symptoms are difficult to identify, but fortunately, in this case, the cervical rigidity suggested a neuroinfection, and later, the cervical pain raised doubt about the diagnosis, so, a CT scan of the neck was requested, which revealed the RPA.

In children, common causes of DNI include such as haematogenous and suppurative cervical adenitis, tonsillitis, and pharyngitis. In adults, the main cause is usually related to dental issues. In terms of causative microorganisms of RPA, *Staphylococcus aureus* (SA) is the most common isolate from neck abscesses, but polymicrobial isolates such as aerobes, anaerobes, and gram-negative organisms are also present in RPA. In all cases, that pathology requires empirical treatment with broad-spectrum antibiotics^{6,10}. Recently, the incidence of methicillin-resistant SA (MRSA) has increased^{6,11}. Naseri et al.¹² evaluated 21,009 paediatric head and neck SA infections between 2001 and 2006 in the U.S. and found that MRSA was seen in 21.6% of all the patients, increasing from 11.8% in 2001 to 28.1% in 2006, representing an increase of 16.3 percentage points over six years. The increased use of antibiotics may put selective pressure on resistant strains¹⁰.

The choice of surgical treatment depends on clinical manifestations, imaging reports, and antibiotic response¹¹. In this case, the patient required referral to a higher level of complexity for a surgical procedure due to stationary clinical evolution and a severe worsening of laboratory tests. The patient was successfully treated requiring abscess drainage, and was subsequently discharged without complications.

Conclusion

RPA is a rare and complex disease requiring special attention in the paediatric population. Higher presentation rates of this disease appear to be associated with patterns of antibiotic resistance. Knowledge of clinical manifestations and primary diagnostic tools is essential to prompt recognition. The presentation of RPA in infants is even rarer, and the diagnosis is challenging due to the difficulty in identifying the typical RPA symptoms in this population. Timely treatment of this entity is crucial to avoiding life-threatening complications, especially in the infant population.

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Ethics

Informed Consent: Written consent was obtained from parents for publication.

Footnotes

Author Contributions: Rojas-Urrea A: Concept, Design, Analysis or Interpretation, Literature Search, Writing; Arias-Mariño D: Concept, Design, Analysis or Interpretation, Literature Search, Writing; Otero-Lopez RD: Surgical and Medical Practices, Concept, Design, Analysis or Interpretation, Data Collection or Processing, Literature Search; Jimenez-Barrera FL: Surgical and Medical Practices, , Design, Analysis or Interpretation, Data Collection or Processing, Literature Search; Garcia-Agudelo L: Design, Analysis or Interpretation, Data Collection or Processing, Literature Search, Writing.

Conflict of Interest: The authors have no conflicts of interest to declare.

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