



Pediatrics

# Neonatal epididymo-orchitis with pyocele mimicking testicular torsion: A case report

Abdullah Ayed<sup>a</sup>, Abderrazak Alik<sup>b</sup>, Shahid Khan<sup>c</sup>, Mutasim E. Ibrahim<sup>d,\*</sup>

<sup>a</sup> Department of Surgery, College of Medicine, University of Bisha, Bisha, Saudi Arabia

<sup>b</sup> Consultant Urologist, Maternity & Children's Hospital, Bisha, 67631, Saudi Arabia

<sup>c</sup> Acting Registrar of Pediatric Urology, Maternity & Children's Hospital, Bisha, 67631, Saudi Arabia

<sup>d</sup> Department of Microbiology and Clinical Parasitology, College of Medicine, University of Bisha, Bisha, Saudi Arabia



## ARTICLE INFO

### Keywords:

Epididymo-orchitis  
Pyocele  
Neonates  
Saudi Arabia

## ABSTRACT

We report a case of epididymo-orchitis (EO) in a 12-day-old Saudi boy. The neonate, initially diagnosed with hydrocele post-delivery, presented with left scrotal swelling. Doppler ultrasound revealed normal testicles but an enlarged, echogenic left epididymis with pyocele. Despite initial therapy with amoxicillin and cefotaxime, a repeated ultrasound indicated compromised testicular vascularity, necessitating emergency surgical exploration. This revealed purulent discharge and inflammation, with *Escherichia coli* as a causative agent. Post-surgery, the patient showed significant improvement and was discharged in good condition after a ten-day of hospitalization. The study emphasizes the significance of including EO in the possible diagnoses for neonatal scrotal swelling.

## 1. Introduction

Epididymo-orchitis (EO) is an inflammation of the epididymis and testis. It predominantly affects adult males, and its incidence in the neonatal population is extremely rare. The etiology in neonates differs significantly from that of adults, presenting diagnostic challenges due to uncommon occurrences and non-specific clinical presentation. The condition in newborns is often associated with congenital abnormalities and, less frequently, with postnatal infections.<sup>1</sup>

Managing EO in neonates is a complex process that requires a careful and nuanced approach from healthcare professionals. Considering neonates' unique physiological characteristics and differential response to treatment modalities, traditional management strategies may not directly apply to them.<sup>2</sup> Prompt diagnosis and appropriate management are crucial, as delays can lead to complications such as abscess formation and testicular atrophy.<sup>1</sup>

The rarity of EO in neonates means a limited body of literature on the subject, with most understanding extrapolated from studies in older populations. In this report, we present a rare case of EO in a 12-day-old neonate, which was accompanied by a paratesticular collection of pyocele mimicking testicular torsion, leading to a misdiagnosis on imaging examination.

## 2. Case presentation

A 12-day-old boy was referred to our hospital due to a left scrotal swelling. The baby was full-term born via spontaneous vaginal delivery. His perinatal history was unremarkable until left scrotal swelling was noted at ten days by his mother. On admission, physical examination revealed a swollen, erythematous, hard, but non-tender left scrotum. Following the initial assessment, a Doppler ultrasound showed that both testicles were normal in size, echo pattern, and vascularity, but the left epididymis was enlarged with increased echogenicity and vascularity (Fig. 1A). In addition, a large, complex, septate scrotal fluid consistent with pyocele was observed around the left testicle. Initial complete blood count (CBC) revealed increased total leucocyte count (TLC) ( $21.0 \times 10^9/L$ ) with other normal parameters. Empirical intravenous treatment was started with amoxicillin (30mg/kg/12/h), and cefotaxime (50 mg/kg/8 h) was started. The patient has been admitted to the neonatal intensive care unit (NICU) for further medical care and treatment.

After two days, the patient's condition remained unchanged clinically. Then, a second Doppler ultrasound was performed, which identified a left scrotal soft tissue mass lesion that raised the suspicion of an organized hematoma or infected hydrocele, while the testicle appeared normal. Hematological laboratory findings showed a high TLC ( $20 \times 10^9/L$ ), platelet count was  $585 \times 10^9/L$ , and hemoglobin concentration

\* Corresponding author.

E-mail address: [meibrahim7@gmail.com](mailto:meibrahim7@gmail.com) (M.E. Ibrahim).

<https://doi.org/10.1016/j.eucr.2024.102702>

Received 3 February 2024; Received in revised form 3 March 2024; Accepted 4 March 2024

Available online 8 March 2024

2214-4420/© 2024 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

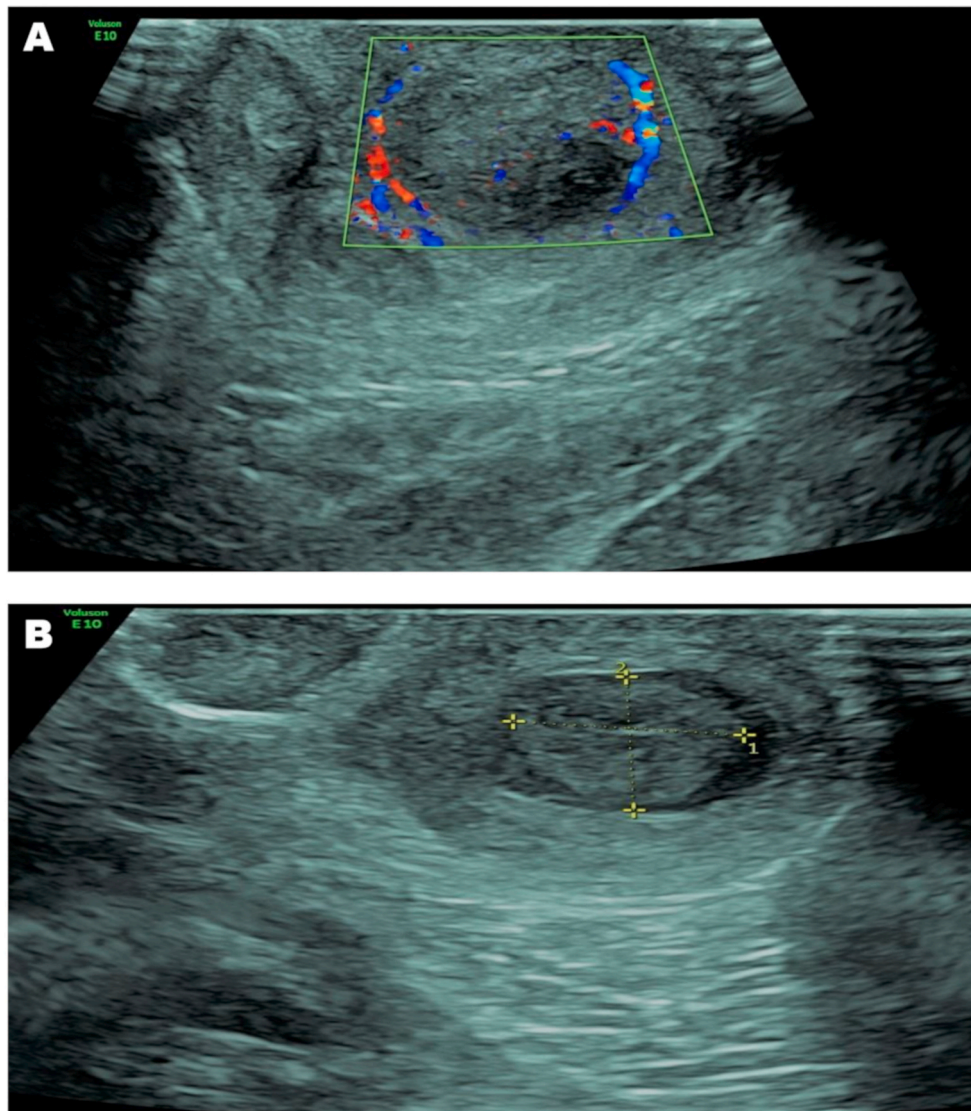
was 18.0 g/dl. Prothrombin time activated partial thromboplastin time and international normalized ratio (INR) were normal. The C-reactive protein (CRP) level was elevated at 22.0 mg/L (average value 0.0–5.0 mg/L). The results of tumor marker tests for alpha-fetoprotein, testicular lactate dehydrogenase, and  $\beta$ -human chorionic gonadotropin were all normal. The baby was started on intravenous piperacillin/tazobactam (80 mg/kg/every 8h) and amikacin (15 mg/kg/24h).

On the third day, the patient's condition remained unchanged clinically, prompting a repeat ultrasound, which revealed compromised vascularity of the left testicle (Fig. 1B). An emergency exploratory surgery was conducted under general anesthesia. A transverse scrotal incision revealed thick, purulent discharge and inflammatory fluids. The tunica vaginalis and epididymis were inflamed and swollen, but the testicle was viable and healthy (Fig. 2). The pus and inflammatory tissues were evacuated for analysis and culture/sensitivity testing. The scrotal wound was closed following the procedure. Culture and sensitivity testing of inflammatory tissue revealed *Escherichia coli*, which was susceptible to most tested antibiotics.

The postoperative period showed marked improvement in erythema and swelling. The baby required an additional ten-day hospital stay for further medical care. By the time of discharge, the wound had



**Fig. 2.** Intraoperative picture showing evacuation of the pyocele testes, which is viable with no torsion.



**Fig. 1.** Doppler ultrasound of scrotal. (A) Enlarged left epididymis with increased echogenicity and vascularity. (B) Repeat ultrasound showing compromised vascularity of the left testicle.



**Fig. 3.** Preoperative picture at the time of discharge showing complete healing of the wound.

completely healed (Fig. 3). TLC and other blood count parameters were normal. The CRP level had decreased to 1.5 mg/L. The baby was discharged in good condition.

### 3. Discussion

This case report presents a rare EO in a neonate, a condition seldom encountered in pediatric urology. This condition was accompanied by a para-testicular collection of pyocele mimicking testicular torsion, leading to a misdiagnosis on imaging examination. Diagnosing and managing such cases are challenging due to their rarity and the non-specific clinical presentation in neonates. This case is notable for its presentation at an extremely young age, only ten days postpartum, and the eventual discovery of *E. coli* infection as the causative agent.

The differential diagnosis of scrotal swelling in neonates includes testicular torsion, hernia, hydrocele, and infection. It can also be predisposed by congenital abnormalities, such as vasal anomaly leading to the retrograde passage of sterile or infected urine.<sup>3</sup> In our case, there were no apparent predisposing congenital factors, making it an unusual presentation. It was previously suggested that an ultrasound of the pelvis and abdomen should be performed in all neonates with EO to exclude anatomical abnormalities.<sup>3</sup>

The absence of tenderness in the scrotal area may be misleading, initially pointing away from infection. In such cases, Doppler ultrasound plays a crucial role in diagnosing neonatal scrotal conditions.<sup>2</sup> In the present case, ultrasound was instrumental in differentiating between torsion and EO, appropriately guiding clinical management. However, it is worth noting that, in the repeated Doppler ultrasound, there was a suspicion of an organized hematoma or infected hydrocele, highlighting the complexity of diagnosing scrotal conditions in neonates.

As previously mentioned, the retrograde passage of infection urine and bloodstream infections was reported in neonatal EO.<sup>1</sup> Similarly, bacterial infections were reported in neonates with EO, including *Pseudomonas aeruginosa*, *Salmonella* species, and *E. coli*.<sup>2,3</sup> Identifying *E. coli* as the causative agent is noteworthy in our case. A previous report suggested that *E. coli* can cause neonatal EO through ascending routes from the infected urinary tract,<sup>2</sup> given its prevalence in urinary tract infections. This raises the question of whether undiagnosed or asymptomatic bacteriuria could have contributed. In neonates, the immune system is not fully developed, potentially increasing susceptibility to infections from common pathogens like *E. coli*.<sup>1</sup> Therefore, *E. coli* EO in a

neonate highlights the importance of antibiotic stewardship. The choice of antibiotics should be guided by local antimicrobial sensitivity patterns, especially given the rising concern of antibiotic resistance.<sup>4</sup>

The management of neonatal EO typically involves antibiotic therapy, as was employed in this case. The choice of antibiotics, amoxicillin, cefotaxime, piperacillin/tazobactam, and amikacin, was in accordance with the empirical treatment protocols for suspected neonatal infections.<sup>5</sup> The surgical intervention in this case, prompted by the lack of improvement and the compromised vascularity of the testicle, as revealed in the repeat ultrasound, underscores the need for vigilant monitoring and readiness to escalate treatment in such cases. The patient's recovery, with normalization of inflammatory markers and wound healing, was observed following the surgical management of the case.

### 4. Conclusion

This case report enhances our understanding of the difficulties involved in diagnosing and treating neonatal EO. It is crucial to promptly and aggressively manage this condition to prevent potential complications. The study emphasizes the significance of including EO in the list of possible diagnoses for neonatal scrotal swelling.

### Ethical approval

Written informed consent was obtained from the parent of the patient after the study's procedures were explained.

### Funding

This study received no funding from any resource.

### CRediT authorship contribution statement

**Abdullah Ayed:** Writing – original draft, Methodology, Investigation, Conceptualization. **Abderrazak Ali:** Supervision, Investigation, Data curation, Conceptualization. **Shahid Khan:** Writing – review & editing, Visualization, Methodology. **Mutasim E. Ibrahim:** Writing – review & editing, Validation, Supervision, Conceptualization.

### Declaration of competing interest

None declared.

### Acknowledgements

The author is thankful to the Deanship of Graduate Studies and Scientific Research at the University of Bisha for supporting this work through the Fast-Track Support Program.

### References

- Chiang MC, Chen HW, Fu RH, Lien R, Wang TM, Hsu JF. Clinical features of testicular torsion and epididymo-orchitis in infants younger than 3 months. *J Pediatr Surg.* 2007;42(9):1574–1577. <https://doi.org/10.1016/j.jpedsurg.2007.04.020>.
- Chiang MC, Wang TM, Fu RH, Chu SM, Chou YH. Early-onset Escherichia coli sepsis presenting as acute scrotum in preterm infant. *Urology.* 2005;65(2):389. <https://doi.org/10.1016/j.urology.2004.09.003>.
- Kabiri M, Barkat A, El Ajaje H, Allali N, Dafiri R, Lamdouar-Bouazzaoui N. Neonatal epididymo-orchitis caused by *Pseudomonas aeruginosa*: a case report. *Cases J.* 2010;3(2). <https://doi.org/10.1186/1757-1626-3-44>.
- Ibrahim ME. Prevalence of plasmid-mediated quinolone resistance and 16S rRNA methylase genes among *Escherichia coli* clinical isolates in a hospital in Saudi Arabia. *Bacteria isolates. Pakistan J Med Sci.* 2023;36(6):1909–1916.
- Aguilera-Alonso D, Del Rosal T, Pérez Muñoz S, Baquero-Artigao F. Neonatal epididymo-orchitis with pyocele caused by *Escherichia coli*: successful treatment with antimicrobial therapy alone. *Enferm Infecc Microbiol Clín.* 2018;36(8):530–531. <https://doi.org/10.1016/j.eimc.2017.10.018>.