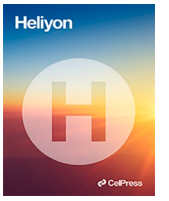
Heliyon 10 (2024) e32993

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon



Case report

Eosinophilic cystitis mimics bladder tumor: A rare case report

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ARTICLE INFO

Keywords:
Eosinophilic
Cystitis
Tumor
Bladder
Mimic

ABSTRACT

Eosinophilic cystitis is a rare inflammatory condition of the bladder characterized by eosinophils infiltrating the bladder wall. It affects people of all ages and with no gender difference. Eosinophilic cystitis can mimic bladder tumors and other chronic cystitis, which makes it a challenging condition to diagnose. In this article, we will discuss the causes, symptoms, diagnosis, and treatment of eosinophilic cystitis, as well as how it might be mistaken for bladder tumors.

1. Introduction

Eosinophilic cystitis (EC) is a rare clinicopathological condition characterized by the infiltration of eosinophils into the bladder wall [1]. Clinically, EC mimics bladder cancer. So far, 200 instances have been reported, and children are even rare [2,3]. The first case dates back to 1960 [4]. EC can be caused by a variety of factors, including hypereosinophilic syndrome, inflammatory diseases, neoplasia, parasitic or fungal infections, and IgE-related diseases [5]. Symptoms included frequency, haematuria, suprapubic discomfort, and urine retention [6]. In this report, we present a unique case of eosinophilic cystitis in a 59-year-old male that mimics a bladder tumor, with no preceding medical conditions or known triggers, highlighting the diagnostic challenge and the importance of considering EC in differential diagnosis.

2. Case presentation

A 59-year-old male presented to our urology clinic with complaints of blood in the urine and lower abdominal pain for the past three months. The patient had no past medical history of asthma or allergies. He denied any history of previous urologic surgeries, urinary tract infections, or sexually transmitted infections. Physical examination was unremarkable, except for mild tenderness in the lower abdomen. Laboratory tests revealed a normal complete blood count and serum creatinine. Urine analysis showed numerous red blood cells and no significant bacteria on microscopy. The urine culture was negative. An initial cystoscopy was performed, which showed a whitish papillary lesion measuring approximately 1.8 cm in the lateral wall of the bladder **[Fig. 1]**. Given the suspicious appearance of the bladder lesion, transurethral resection of the bladder tumor (TURBT) was performed. The histopathological

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https://doi.org/10.1016/j.heliyon.2024.e32993
Received 30 June 2023; Received in revised form 10 June 2024; Accepted 12 June 2024
Available online 13 June 2024

examination of the resected specimen revealed an inflammatory infiltrate composed mainly of eosinophils **[Fig. 2(A–D)]** . No evidence of malignancy was found. A diagnosis of eosinophilic cystitis was made. Treatment with oral prednisolone 30 mg/day along with alpha-1 adrenergic receptor. The patient remained asymptomatic during subsequent follow-up visits. Prednisolone was tapered and discontinued after 9 months. Repeat urine analysis and cystoscopy showed no evidence of recurrent disease.

3. Discussion

Eosinophilic cystitis (EC) is a rare disease of the bladder with no clear inflammatory etiology, posing challenges in understanding its origin and development [7]. Brown and Palubinskas were the first to describe this entity, which mimics bladder tumors in 1960 [4]. Despite extensive research, the precise etiological factors contributing to EC remain elusive. While some cases have been associated with vesicular injuries, parasitic infections, bladder surgeries, or food and drug allergies [3], our patient, in this particular instance, had no history of parasitic illnesses or prior medical conditions. Recent studies suggest that EC may be linked to complex immunological responses involving antigen-antibody interactions, leading to eosinophilia and initiating the inflammatory process [1]. However, the specific triggers and mechanisms underlying these immunological responses are still under investigation. Hypereosinophilia, tumors, parasites, fungal infections, and recurrent IgE diseases have all been proposed as potential contributors [5]. Understanding the etiology of EC is crucial for developing targeted and effective treatment strategies. Further research is needed to unravel the intricate pathways and factors that lead to the development of eosinophilic cystitis. By elucidating the underlying causes, we can pave the way for more personalized and precise therapeutic approaches in the future. The distribution is equal among males and females [8]. The most prevalent presenting symptoms, according to van der Ouden, are urinary frequency (67 %), dysuria (62 %), gross/microscopic haematuria (68 %), suprapubic pain (49 %), and urinary retention (10 %) [9]. Our patient had a history of urinary complaints such as urgency, dysuria, and haematuria. Although interstitial cystitis (IC) is a distinct condition, it shares some similarities with eosinophilic cystitis. Both conditions can cause bladder pain, and individuals with eosinophilic cystitis may experience symptoms overlapping with those of interstitial cystitis [9,10]. Eosinophilic and interstitial cystitis may be considered the final common pathway for allergic cystitis [11]. However, while cystoscopy alone cannot reliably distinguish eosinophilic cystitis from various bladder tumors, histopathological examination, specifically through biopsy, remains the gold standard for an accurate diagnosis [12]. The majority of individuals with eosinophilic cystitis have been cured, but recurrence is common [8]. Endoscopy-guided excision of the lesion is the mainstay of treatment. Prednisone with or without antihistamines is recommended as a first-line treatment [13,14]. Immunosuppressants such as cyclosporine and azathioprine have been used if there is no response to steroids [2]. Eosinophilic cystitis closely resembles other inflammatory and malignant bladder disorders that may precede or be associated with it. Early detection and immediate treatment are required to achieve the best outcome. Finally, the rationale for presenting this case is to highlight the diagnostic challenge posed by eosinophilic cystitis, which can closely mimic bladder tumors. Given its rarity and the potential for misdiagnosis, this case underscores the importance of considering eosinophilic cystitis in the differential diagnosis of bladder lesions. The clinical implications include the necessity for accurate histopathological examination to prevent unnecessary aggressive treatments for presumed malignancy. This case also emphasizes the effectiveness of corticosteroid therapy in managing EC, contributing to the body of evidence supporting conservative treatment approaches for this condition.

4. Conclusion

Eosinophilic cystitis is a rare inflammatory bladder illness characterized by the infiltration of eosinophils in the bladder wall. It can

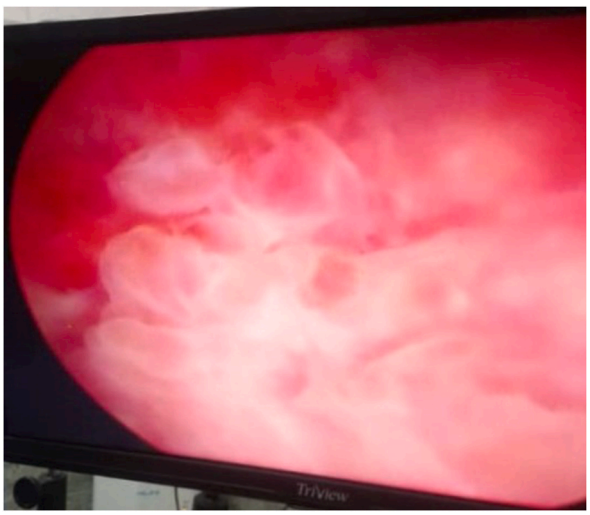

Fig. 1. Cystoscopy image shows a whitish papillary lesion measuring approximately 1.8 cm in the lateral wall of the bladder.

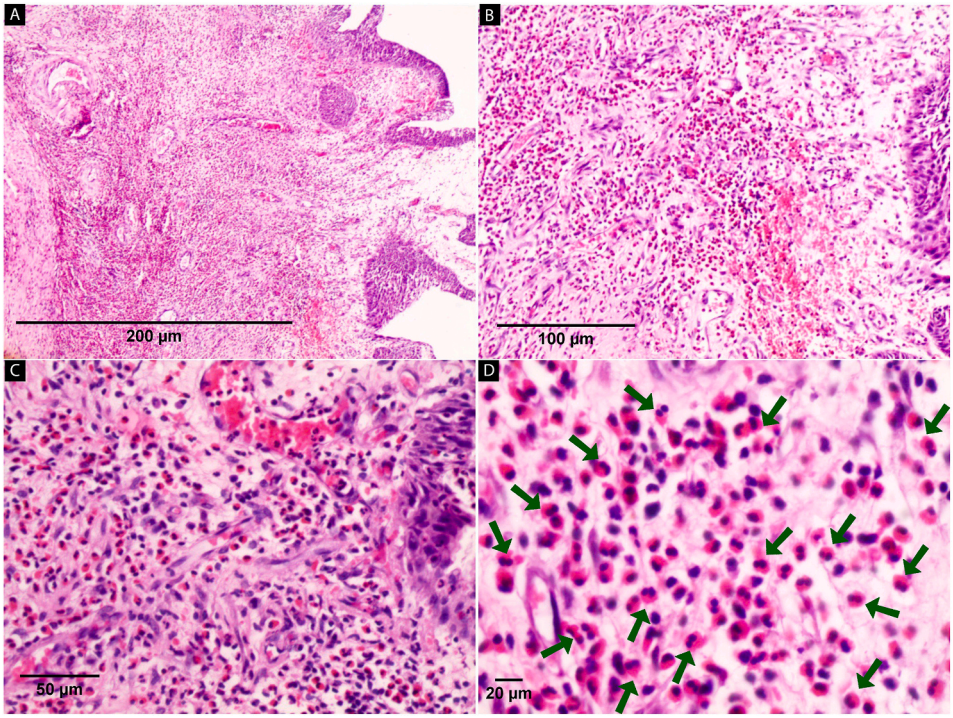

Fig. 2. H&E stain (A–D): Microscopic images of the bladder biopsies. (A) Low magnification view showing widespread inflammatory infiltrate (40×). (B) Medium magnification view highlighting eosinophilic infiltration (100×). (C) High magnification view of the inflammatory infiltrate with prominent eosinophils (200×). (D) Detailed high-power field showing eosinophils clearly (indicated by arrows) (400×).

present with symptoms similar to those of bladder tumors, therefore, it can be difficult to identify. However, eosinophilic cystitis can be diagnosed and treated efficiently using a combination of imaging tests, urine tests, and biopsies. In most cases, early detection and treatment can result in a favorable outcome.

Ethics approval and consent to participate

Ethics approval was not required by the authors' institution, as the present study is a case report. All methods were performed in accordance with the relevant guidelines and regulations. Informed signed consent to participate was obtained from the patient.

Consent for publication

The patient provided consent and agreed for all images, clinical data, and other data included in the manuscript to be published.

Data availability statement

Not applicable.

Additional information

No additional information is available for this paper.

Funding

None.

CRediT authorship contribution statement

Moatasem Hussein Al-janabi: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Farah Munzer Ali:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Ali Nammour:** Validation, Resources, Investigation, Data curation,

Conceptualization. **Rabab Salloum:** Validation, Resources, Investigation, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

None.

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