

# Eosinophilic Cystitis: A Rare Cause of Nocturnal Enuresis in Children

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## Abstract

**Introduction:** Eosinophilic cystitis (EC) is a rare and poorly understood inflammatory condition, characterized by eosinophilic infiltration of all layers of the bladder wall, which mimics bladder tumors. EC may present with symptoms such as increased urination frequency, dysuria, gross/microscopic hematuria, suprapubic pain and urinary retention.

**Case Presentation:** We present a 17-year-old male patient, who was continent night and day in his childhood, and was admitted to our clinic for complaints of hematuria and nocturnal enuresis for the past six months. His history and physical examination were unremarkable, and routine hematological and biochemical tests were normal. Cystoscopy revealed a 4 × 3 cm erythematous, polypoidal, solid lesion on the bladder dome. Histopathological examination of the lesion revealed transitional epithelium with stromal edema, where diffuse, dense infiltration of lamina propria by eosinophils and lymphocytes was also seen. According to these findings, a histopathological diagnosis of EC was made, and the patient was treated with corticosteroids, antimicrobial agents and antihistamines. His symptoms dramatically improved and nocturnal enuresis also recovered after treatment.

**Conclusions:** Although it is a rare entity, EC should be kept in mind in the differential diagnosis of patients presenting with dysuria, hematuria and any kind of acquired voiding dysfunction, including frequency, pollakiuria and incontinence.

**Keywords:** Eosinophilic Cystitis, Bladder Tumor, Hematuria, Enuresis

## 1. Introduction

Eosinophilic cystitis (EC) is a rare and a poorly understood clinicopathologic entity, which mimics bladder tumors. It is an inflammatory condition characterized by eosinophilic infiltration of all layers of the bladder wall. Even though many etiological factors have been suggested, the exact mechanism of the lesion remains clouded. EC presents with a spectrum of urological symptoms as varied as increased frequency, dysuria, gross/microscopic hematuria, suprapubic pain and urinary retention (1). Current treatment approaches include observation, identification of incriminating allergens and medical modalities such as steroids, antihistamines and antibiotics. In cases of resistant hematuria, transurethral bladder resection and partial cystectomy can be performed (2).

## 2. Case Presentation

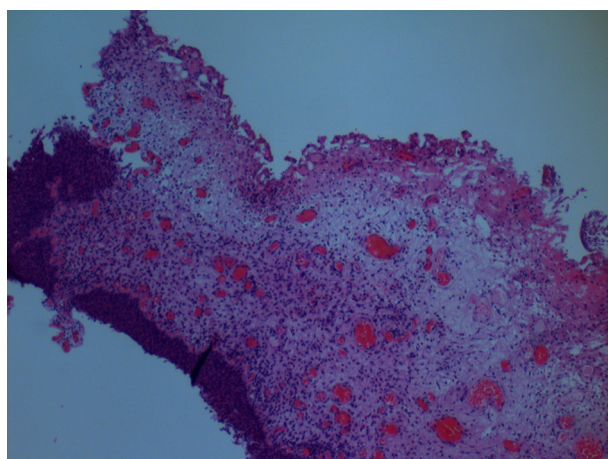
Our patient was a 17-year-old male, who was continent night and day during childhood, but was admitted to our clinic for some complaints of hematuria and nocturnal enuresis for the past six months. He also gave a history of dysuria, frequency, urgency and passage of blood clots

in the urine. His general physical examination was unremarkable and there was no past history of allergy. A routine hematological examination and biochemical profile was within normal limits. Analysis of midstream urine showed RBCs 38/HPF, leukocytes 3-5/HPF and few epithelial cells. Urine culture showed no growth. Skin testing for allergies was negative for all substances. Urinary ultrasonography (US) showed focal bladder wall thickening (13.5 mm) in the dome of the bladder (Figure 1). The patient underwent cystoscopy, which revealed a 4 × 3 cm erythematous, polypoidal, solid lesion on the bladder dome. Considering the radiological and cystoscopy features, a transurethral resection biopsy of the lesion was carried out, and the bladder was catheterized for two days. The histopathological examination revealed transitional epithelium with stromal edema and congested blood vessels. There was diffuse, dense infiltration of lamina propria by eosinophils and a few lymphocytes, with areas of hemorrhage. According to these findings, a histopathological diagnosis of EC was made (Figures 2 and 3). There was no evidence of malignancy or parasites in the sections that were studied. The patient was treated with corticosteroids, antimicrobial agents and antihistamines, and his symptoms dramatically improved and the post-operative period was quite

comfortable. His nocturnal enuresis also recovered after treatment. In his last follow-up in March 2015, the patient was free of all symptoms, and there was no recurrence in his control cystoscopy.



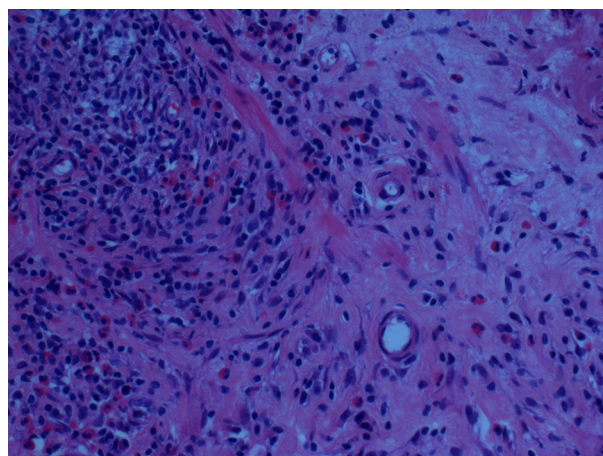
**Figure 1.** The Bladder Wall Thickening in the Dome of Bladder



**Figure 2.** Bladder Biopsy With Denuded Epithelium, Mucosal Edema and Infiltration by Eosinophils Into Lamina Propria (H and E  $\times 10$ )

### 3. Discussion

Eosinophilic cystitis (EC) is a rare and poorly understood process, and was first described by Brown in 1960 (3). Patients can present clinically with a spectrum of urological symptoms including episodes of dysuria, hematuria,



**Figure 3.** Edematous Lamina Propria With Infiltration by Plenty of Eosinophils (H and E  $\times 20$ )

suprapubic pain, diurnal and nocturnal urinary frequency (4). Patients in this study showed hematuria and nocturnal enuresis. Although the exact etiology of EC is still unclear, allergic response is the most likely reason. The allergic response is caused by the antigen-antibody reaction, leading to production of various immunoglobulins, which in turn cause activation of eosinophils that initiate the inflammatory process (5). Vesical injury, chronic vesical irritation, surgery, parasitosis, food/drug allergy, tuberculous cystitis and malignancies are known to be associated with EC (4). No specific allergen was found in this case. Peripheral eosinophilia is also reported in many cases, and some patients with EC present with pyuria and a positive urine culture (6). Our patient had no peripheral eosinophilia and a negative urine culture.

In imaging studies of patients with EC (such as cystoscopy and US), findings can mimic a bladder tumor. Since cystoscopy cannot distinguish EC from other diseases, such as bladder neoplasms or other benign diseases, a histopathological examination is necessary (5, 7). The gold standard for the diagnosis of such lesions is bladder biopsy; otherwise the diagnosis can be missed.

In the treatment of EC cases, antihistamines, antibiotics, corticosteroids, non-steroidal anti-inflammatory drugs, montelukast sodium, cyclophosphamide, cyclosporine, mitomycin, hydrodistension and intravesical silver nitrate are used (6). However, because of the very limited number of cases, which results in inadequate clinical experience, there is no standard treatment of EC. In this case, our patient responded to a combination treatment modality, which was transurethral resection of the lesion, plus a combination of corticosteroids, antibiotics

and antihistamines.

EC is a very rare entity with varying clinical features, and it should be considered in cases of hematuria and increased bladder wall thickness. Histological examination is necessary for accurate diagnosis. Because there is no specific curative treatment available for this disease, EC therapy is unique, and the treatment is curative in most individuals with identification and withdrawal of precipitating agents.

#### Footnote

**Authors' Contribution:** Study concept and design: Ozcan Kilic and Murat Akand; acquisition of data: Murat Gul, Ozcan Kilic and Pinar Karabagli; analysis and interpretation of data: Murat Akand and Ozcan Kilic; drafting of the manuscript: Murat Akand and Murat Gul; critical revision of the manuscript for important intellectual content: Ozcan Kilic and Serdar Goktas; study supervision: Serdar Goktas.

#### References

1. van den Ouden D. Diagnosis and management of eosinophilic cystitis: a pooled analysis of 135 cases. *Eur Urol.* 2000;**37**(4):386–94.
2. Ladocsi LT, Sullivan B, Hanna MK. Eosinophilic granulomatous cystitis in children. *Urology.* 1995;**46**(5):732–5. doi: [10.1016/S0090-4295\(99\)80313-6](https://doi.org/10.1016/S0090-4295(99)80313-6). [PubMed: [7495133](https://pubmed.ncbi.nlm.nih.gov/7495133/)].
3. Brown EW. Eosinophilic granuloma of the bladder. *J Urol.* 1960;**83**:665–8. [PubMed: [13804922](https://pubmed.ncbi.nlm.nih.gov/13804922/)].
4. Pomeranz A, Eliakim A, Uziel Y, Gottesman G, Rathaus V, Zehavi T, et al. Eosinophilic cystitis in a 4-year-old boy: successful long-term treatment with cyclosporin A. *Pediatrics.* 2001;**108**(6):E113. [PubMed: [11731640](https://pubmed.ncbi.nlm.nih.gov/11731640/)].
5. Teegavarapu PS, Sahai A, Chandra A, Dasgupta P, Khan MS. Eosinophilic cystitis and its management. *Int J Clin Pract.* 2005;**59**(3):356–60. doi: [10.1111/j.1742-1241.2004.00421.x](https://doi.org/10.1111/j.1742-1241.2004.00421.x). [PubMed: [15857336](https://pubmed.ncbi.nlm.nih.gov/15857336/)].
6. Popescu OE, Landas SK, Haas GP. The spectrum of eosinophilic cystitis in males: case series and literature review. *Arch Pathol Lab Med.* 2009;**133**(2):289–94. doi: [10.1043/1543-2165-133.2.289](https://doi.org/10.1043/1543-2165-133.2.289). [PubMed: [19195972](https://pubmed.ncbi.nlm.nih.gov/19195972/)].
7. Salman M, Al-Ansari AA, Talib RA, El Malik el F, Al-Bozaom IA, Shokeir AA. Eosinophilic cystitis simulating invasive bladder cancer: a real diagnostic challenge. *Int Urol Nephrol.* 2006;**38**(3-4):545–8. doi: [10.1007/s11255-006-0103-5](https://doi.org/10.1007/s11255-006-0103-5). [PubMed: [17115289](https://pubmed.ncbi.nlm.nih.gov/17115289/)].