Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Emphysematous Cystitis: A Radiologically Illustrative Rare Case

M. Boussif[1]*, Z. Ait Said[1], Ma. Nouri[1], Y. Bouktib[1], A. El Hajjami[1], B. Boutakioute[1], M. Ouali Idrissi[1], N. Cherif Guennouni Idrissi[1]

[1]Department of Radiology, Arrazi Hospital, University Hospital of Mohamed VI, Marrakech, Morocco

DOI: https://doi.org/10.36347/sjmcr.2025.v13i05.038 | **Received:** 02.04.2025 | **Accepted:** 12.05.2025 | **Published:** 15.05.2025

***Corresponding author:** M. Boussif
Department of Radiology, Arrazi Hospital, University Hospital of Mohamed VI, Marrakech, Morocco

Abstract **Case Report**

Emphysematous cystitis is an uncommon urinary tract infection characterized by the spontaneous formation of gas within the bladder and/or its wall. Computed tomography (CT) of the abdomen and pelvis is the imaging modality of choice. We present the case of a 78-year-old female admitted with abdominal pain and vomiting. Clinical examination revealed epigastric tenderness. Laboratory findings demonstrated an inflammatory syndrome and pyuria on urinalysis. An uncomplicated emphysematous cystitis, incidentally discovered, was diagnosed following an urgent CT scan of the abdomen and pelvis.

Keywords: CT scan, Emphysematous cystitis, urinary tract infection, diabetes.

INTRODUCTION

Emphysematous cystitis is a rare form of urinary tract infection characterized by the spontaneous accumulation of gas within the bladder or its wall. The most frequently isolated bacteria are Escherichia coli and Klebsiella pneumoniae, with anaerobic bacteria being less common [1]. Abdominopelvic CT remains the standard imaging modality, as it not only confirms the diagnosis but also assesses the extent of gas collections and evaluates any possible concomitant renal involvement [2]. We report the case of a patient in whom emphysematous cystitis was unexpectedly detected.

CASE PRESENTATION

A 78-year-old female with a history of poorly controlled type II diabetes, recurrent urinary infections, vascular leukoencephalopathy with sequelae from ischemic lacunar strokes, and coronary heart disease, presented with acute epigastric pain, nausea, and vomiting. There were no additional symptoms, and the patient remained afebrile with preserved general condition. On clinical examination, she was hemodynamically and respiratorily stable, displaying epigastric tenderness without guarding or fever. Laboratory analysis revealed an inflammatory profile with leukocytosis (14,390/mm³), a C-reactive protein of 194 mg/L, and an elevated lipase level (349 U/L). Subsequent urinalysis revealed gross hematuria, pyuria (640/mm³), and a positive culture for Klebsiella pneumoniae. A contrast-enhanced CT scan of the abdomen and pelvis identified a partially filled bladder with a hydroaeric level and uniform circumferential wall thickening up to 15 mm and the presence of intramural air bubbles. These CT findings were consistent with emphysematous cystitis.

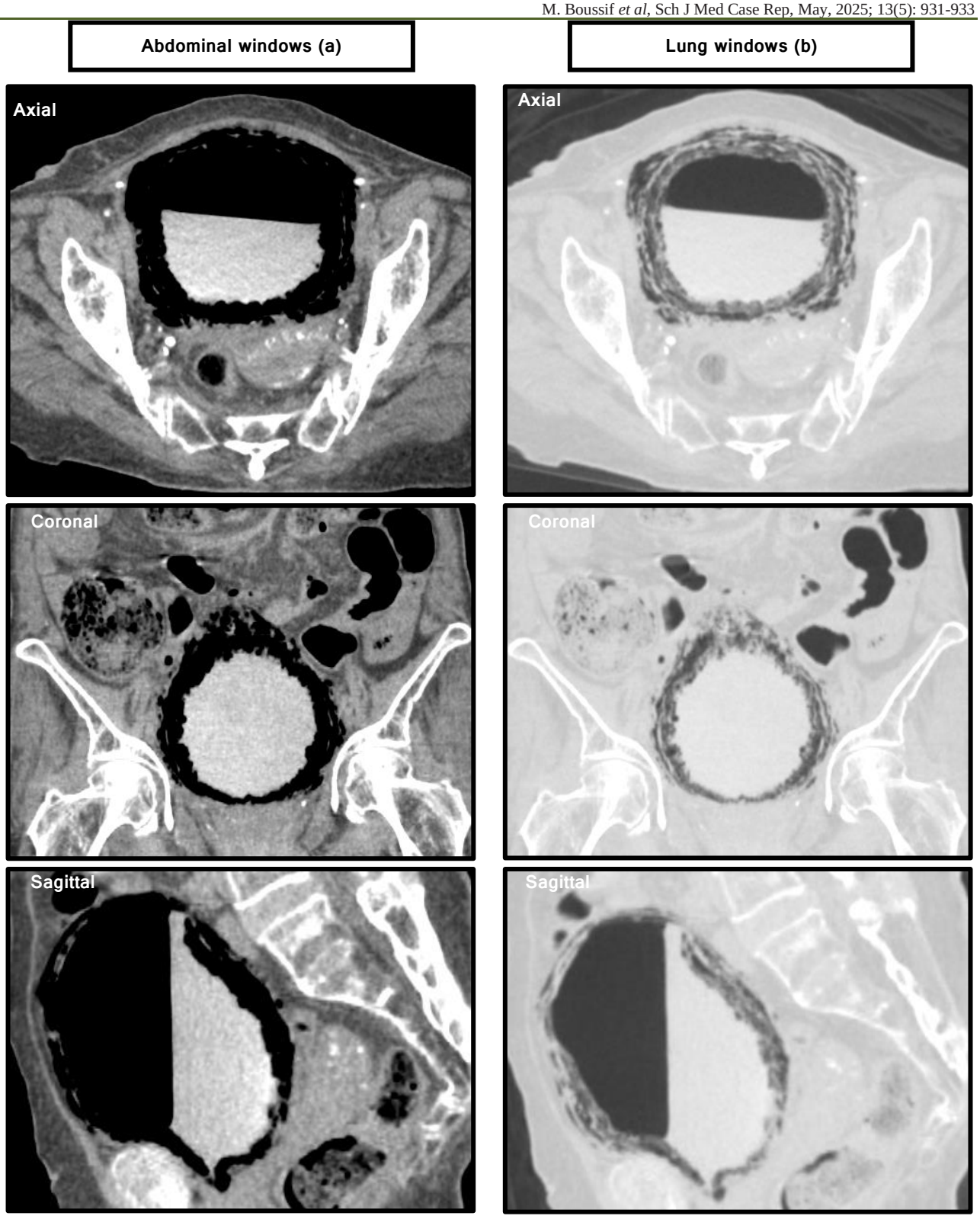

Figure 1: Delayed-phase contrast-enhanced CT scan in the abdominal (a) and lung (b) windows: showing a bladder containing an hydroaeric level with a thickened and emphysematous wall

DISCUSSION

Emphysematous cystitis, also known as a pneumogenic infection, is an uncommon lower urinary tract infection that, while often dramatic in appearance, is usually not severe. This condition is characterized by the spontaneous formation of gas within the bladder wall or lumen resulting from anaerobic bacterial fermentation [3]. The most common pathogens are Escherichia coli and Klebsiella pneumoniae [4,5]. The literature indicates that the average age of affected patients is approximately 70 years [6]. This condition predominantly affects

diabetic women with a history of urinary incontinence and/or retention. Other risk factors include immunosuppression, urinary tract obstruction, and conditions predisposing to urinary stasis (e.g., autonomic neuropathy, prostatic hypertrophy) [6]. The prevalence of this condition has increased over recent decades, largely due to advances in imaging technology [6]. Clinically, emphysematous cystitis presents nonspecifically, with abdominal pain in 80% of cases and irritative urinary symptoms in about 50%, while asymptomatic cases account for 7% [5]. Abdominopelvic CT is the imaging modality of choice because it enables a positive diagnosis through the visualization of gas within the bladder lumen and wall, assessment of the extent of gas collections, and detection of any concurrent renal involvement [2]. Furthermore, CT can help differentiate emphysematous cystitis from primary pneumaturia or communications with hollow organs such as vesicoenteric or vesicovaginal fistulas. The presence of intraluminal gas, when not preceded by recent instrumentation or bladder manipulation, is highly suggestive of emphysematous cystitis, with CT being the diagnostic tool of choice. Plain abdominal radiographs and ultrasound may also reveal the condition [7]. An upright abdominal radiograph might show a gas-filled bladder in the supine position (with a curvilinear radiolucency outlining the bladder wall) and a hydroaeric level on standing films. Ultrasound findings include air bubbles with shadowing within the bladder wall and polypoid islands in the lumen. Nonetheless, these modalities are not recommended for a definitive diagnosis [5]. Major complications include associated renal infection (emphysematous pyelonephritis), necrosis or even bladder rupture, and septic shock, which may necessitate cystectomy. Early treatment is crucial: the mortality rate for emphysematous cystitis is approximately 7%, compared to an average of 44% for emphysematous pyelonephritis [6,8].

CONCLUSION

Emphysematous cystitis is a rare but severe lower urinary tract infection that requires prompt diagnosis and management. Its clinical presentation is often nonspecific; therefore, an urgent abdominopelvic CT scan is essential for establishing the diagnosis. The prognosis is closely linked to early and appropriate treatment.

Conflict of interest: The authors declare no conflicts of interest.

REFERENCES

1. Egawa S, Utsunomiya T, Uchida T, et al. Emphysematous pyelo- nephritis, ureteritis, and cystitis in a diabetic patient. Urol Int 1994;52:176—8.
2. Grayson DE, Abbott RM, Levy AD, Sherman PM. Emphysema- tous infections of the abdomen and pelvis: a pictorial review. Radiographics 2002;22:543—61.
3. Cystite emphysémateuse : à propos de 2 cas. A.BARKIA, N. LARBI, A. MNIF, M. CHEBIL, M. AYED. Service d'Urologie, Hôpital Charles Nicolle, Tunis, Tunisie. Progrès en Urologie (1997), 7, 468-470
4. Amano M, Shimizu T. Emphysematous cystitis: a review of the literature. Int Med 2014;53:79—82.
5. Grupper M, Kravtsov A, Potasman I. Emphysematous cystitis: illustrative case report and review of the literature. Medicine 2007;86:47—53.
6. Thomas AA, Lane BR, Thomas AZ, et al. Emphysematous cystitis: a review of 135 cases. BJU Int 2007;100:17—20.
7. Wojack, P. R., & Goldman, I. A. (2020). Emphysematous cystitis with extraperitoneal gas: new insights into pathogenesis via novel CT findings. Clinical Imaging, 65, 1-4.
8. Kaieser E, Fournier R. Pyélonéphrite emphysémateuse; diagnostic et traite- ment. Ann Urol 2005;39:49–60.