

Introduction

Emphysematous cystitis (EC) is a rare but potentially life-threatening infection characterized by gas accumulation within the bladder wall and lumen.

Most common causative organisms:

- Escherichia coli (58%) and Klebsiella pneumoniae (21%)
- Fungal (Candida) and protozoal causes are exceedingly rare

Diabetes mellitus (DM) is the major risk factor, accounting for 50–70% of EC cases due to hyperglycemia and glucosuria.

This is a unique case of EC in a young woman with poorly controlled type 1 DM, in which *Trichomonas vaginalis* (TV) played a contributory role - a previously unreported association.

Case Presentation

Patient Profile

- 23-year-old woman | Type 1 DM (HbA1c 14.8%) | History of recurrent vaginal infections

Presentation

- Two days of severe lower abdominal pain, dysuria, and vomiting
- Febrile but hemodynamically stable
- Normocytic anemia; normal WBC count

Workup

- Urinalysis: pyuria present
- Bacterial and fungal cultures: negative
- **STI panel:** PCR positive for TV from both urine AND vaginal swabs
- No gas in vaginal wall → emphysematous vaginitis excluded
- CT abdomen/pelvis: gas within the bladder wall → consistent with Emphysematous cystitis
- CT cystogram confirmed diagnosis of EC

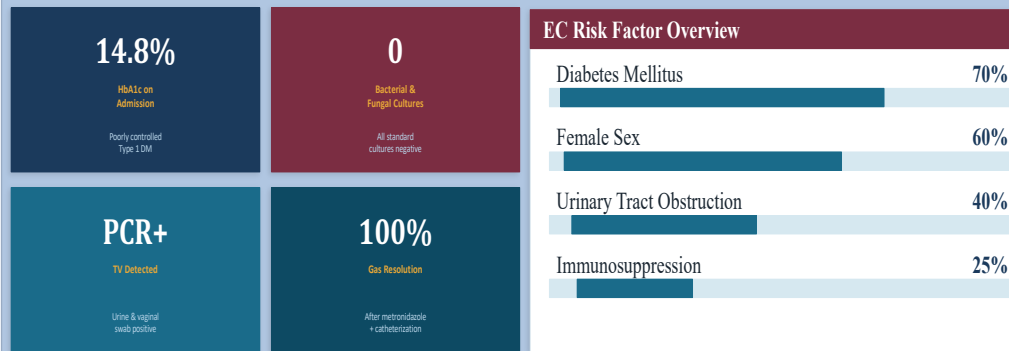
Treatment

- 7-day course of metronidazole
- Foley catheterization for bladder decompression



Air in the bladder lumen and bladder wall, which tracks into the extraperitoneal space on the left consistent with emphysematous cystitis.

Gas within the bladder wall on distention. A small foci of gas anterior to the bladder lumen



References

- Nelson Z, Aslan AT, et al. Guidelines for the Prevention, Diagnosis, and Management of Urinary Tract Infections in Pediatrics and Adults. JAMA Netw Open. 2024;7(11):e2444495.
- Meites E, Gaydos CA, et al. A Review of Evidence-Based Care of Symptomatic Trichomoniasis and Asymptomatic Trichomonas vaginalis Infections. Clin Infect Dis. 2015;61(S8):S837–48.

Discussion

Trichomonas vaginalis

- TV is an anaerobic protozoan that produces hydrogen and CO₂ as metabolic byproducts
- Its pathogenic potential is traditionally confined to the genital tract
- Chronic infection induces epithelial injury and inflammation that may extend into adjacent urinary structures

Synergistic Mechanism

In poorly controlled DM, TV-related inflammation and metabolic gas production may synergistically promote mucosal involvement — mimicking the pathophysiology of bacterial EC.

Why Not Emphysematous Vaginitis?

While TV is associated with emphysematous vaginitis, the absence of gas within the vaginal wall makes concurrent emphysematous vaginitis unlikely in this case.

Conclusion

Maintain high suspicion for protozoal pathogens when standard bacterial and fungal cultures are negative in EC, especially in diabetic women.

STI testing including TV-PCR adds diagnostic value in unexplained or recurrent urinary tract infections.

Chronic TV infection + poorly controlled DM may synergistically drive EC pathogenesis through anaerobic gas production and mucosal injury.