



## Case report

***Gardnerella vaginalis* causing pulmonary infection in a young adult: A novel case**Julie M Bittar (BA)<sup>a,\*</sup>, Joshua Gazzetta (DO)<sup>b</sup><sup>a</sup> Indiana University School of Medicine, Indianapolis, IN, United States<sup>b</sup> Department of Surgery, Indiana University School of Medicine, Indianapolis, IN, United States

## A B S T R A C T

*Gardnerella vaginalis* is an anaerobic, gram-variable bacterium primarily found in vaginal microflora of women. Previous reports of *G. vaginalis* cultured in men are few and have primarily been limited to the gastrointestinal and genitourinary tract.<sup>2–4</sup> Few reports of *G. vaginalis* causing severe infections have been reported in the literature, including septicemia<sup>7</sup> and two cases of perinephric abscess.<sup>8,9</sup> There has been one previously reported case of *G. vaginalis* causing pulmonary complications that occurred in a male alcohol abuser. In our case review, we aim to demonstrate an unusual source of a pulmonary infection and highlight the importance of proper microbial isolation to guide treatment. Our patient is a young male who presented following multiple gunshot wounds including one to his head causing an intracranial hemorrhage, hydrocephalus, and a dural sinus thrombosis. His hospital course was complicated by a decline in neurological status treated with a craniotomy and external drain placement and multiple pulmonary infections. During his fever work-ups, he found to have *G. vaginalis* on mini-bronchoalveolar lavage and was subsequently treated with metronidazole. After treating his *G. vaginalis* pneumonia and other infectious sources, namely *Haemophilus influenzae* and coagulase-negative staphylococcus pneumonias, his fevers and leukocytosis resolved and he was successfully discharged to a rehabilitation facility for neurologic recovery. To our knowledge, this is the second reported case of *G. vaginalis* isolated from a pulmonary culture and the first in a previously healthy, immunocompetent young male outside of the urinary tract.

## 1. Introduction

*Gardnerella vaginalis* is an anaerobic, gram-variable bacterium primarily found in vaginal microflora of women. Previous reports of *G. vaginalis* cultured in men are few and have primarily been limited to the gastrointestinal and genitourinary tract [1–3]. Here, we present a case of *Gardnerella vaginalis* isolated from the lungs of a young man after experiencing a gunshot wound to the head. There has only been one prior case of *G. vaginalis* identified in a pulmonary culture, in which it was found in a 41-year-old alcoholic male [4]. This is the first case of *Gardnerella vaginalis* cultured from the lungs of a young adult.

## 2. Case

A 20-year-old, previously healthy, African American male presented to the emergency department following three gunshot wounds to the left shoulder and one to the occiput. The shoulder wounds were superficial and did not require treatment. He had a GCS of 15 on arrival but a head CT revealed a closed skull base fracture with subdural hemorrhage and a CTA was suggestive of left transverse sinus thrombosis. His head injury was initially managed conservatively, without invasive monitoring, and he was started on a low dose heparin drip for his sinus thrombosis following multiple, stable head CT scans.

On hospital day three, his GCS declined, and a head CT revealed a new posterior fossa intracerebral hemorrhage and hydrocephalus. His heparin was discontinued and reversed with protamine. Subsequently, the patient went to the OR for a suboccipital craniectomy and placement of an external ventricular drain with the neurosurgery team. His postoperative course was complicated by stridor, anterior neck swelling, blood tinged sputum, fevers, and leukocytosis. Four days after surgery, a chest X-ray revealed bilateral lower lobe infiltrates and a new finding of pneumomediastinum. This was further visualized on a CT scan of his chest and an otolaryngologist performed direct laryngoscopy, bronchoscopy, and esophagoscopy and found no evidence of tracheal or esophageal perforation. A mini bronchoalveolar lavage (mini-BAL) was performed, whereby a telescoping catheter was introduced into the lower respiratory tract without the use of a bronchoscope and saline irrigation was used to sample the patient's respiratory secretions for culture. Empiric broad-spectrum antimicrobial therapy with intravenous Vancomycin and Piperacillin/Tazobactam was initiated. The mini-BAL culture showed rare gram-negative rods.

By hospital day 11, the patient went on to develop fevers and leukocytosis, a second mini-BAL was performed, whose culture grew coagulase-negative staph, so the patient was started on ampicillin-sulbactam for four days. His leukocytosis persisted and fluconazole was

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**Table 1**  
Previously reported cases of *G. vaginalis* in men causing severe systemic infection.

Study	Age	Presentation	History	Diagnostic method	Management
Wilson et al. [8]	19	Septicemia with shock secondary to UTI; DIC	Meatal stricture	Urine culture	IV Fluids, platelets, cryoprecipitate, FFP, dopamine, mannitol, cefuroxime and gentamicin; Dilatation of meatal stricture
Calvert et al. [9]	50	Perinephric abscess	30 pack-year smoking, 25 units alcohol/week.	Direct microscopy from perinephric abscess pus; Horse-blood agar	IV High dose benzylpenicillin, cefuroxime, metronidazole
Finkelhor et al. [10]	37	Perinephric abscess	Five years after receiving third kidney transplant	Urine culture	IV Ampicillin
Legrand et al. [4]	41, male	Pulmonary abscess and empyema	Alcohol abuser	Bronchoscopic aspirate and pleural drainage	Clindamycin and minocycline

added empirically. Despite these regimens, he had continued fevers and subsequent CXR's showed new right-sided infiltrate prompting another mini-BAL and empiric Vancomycin and Cefepime treatment on hospital day 15. Another chest CT revealed a 2.5 cm diameter cavity in the right lower lobe with an air fluid level, consistent with an abscess. His third mini-BAL on hospital day 15 revealed *Gardnerella vaginalis* (> 10k cfu) growing in the culture obtained from his lavage fluid, so metronidazole was added to his regimen. Another mini-BAL was performed on hospital day 19 for lack of improvement, and suspected pneumonia, which was positive for *Haemophilus influenzae*. Antibiotics were switched to ceftriaxone and metronidazole, and his fever and leukocytosis resolved after a few days of treatment. After completion of his antibiotic course, the patient showed marked improvement and was discharged to a rehabilitation center where he has continued to improve.

**3. Discussion**

Although *G. vaginalis* has been described as a component of normal vaginal flora, it is implicated to play a role in the pathogenesis of a number of diseases, primarily in the pathogenesis of Bacterial vaginosis in females [5]. *G. vaginalis* is coated with fimbriae that are thought to be responsible for the attachment of the bacterium to the vaginal epithelium as well as to other cells such as red blood cells [5]. Studies show that 90% of bacteria in the biofilm of BV patients was comprised of *G. vaginalis*. [6] This biofilm development allows for further adherence of the bacterium to the epithelium and may play a part in causing systemic disease.

Male carriage of *G. vaginalis* is much less prevalent than female, however the organism is commonly detected in urethral and rectal samples. The rates of asymptomatic male urethral colonization has been estimated at 11.4% [7], but rectal colonization results are conflicting, with reported rates ranging from 0 to 83.2% [2,7]. Of note, the 83.2% rate was obtained by qPCR assay rather than culture in a sample of men who have sex with men. Few reports of *G. vaginalis* causing severe infections have been reported (Table 1) in the literature, including septicemia [8] and two cases of perinephric abscess [9,10]. There has been one previously reported case of *G. vaginalis* causing pulmonary abscess that occurred in a male alcohol abuser [4].

In our patient, *G. vaginalis* was isolated from bronchoalveolar lavage culture, and was presumed to be contributing to the patient's pneumonia as well as potentially to his pulmonary abscess. It is likely that the pathogen was able to attach to the lung epithelium via its fimbriae similarly to how it attaches to vaginal epithelium. However, it is unclear how the organism was transmitted to the lung, although it is possible that it spread through direct contact. After identifying this pathogen, metronidazole was added to his antibiotic regimen of vancomycin and cefepime. For unclear reasons, the patient did not show improvement in the first 4 days after metronidazole initiation, but he did quickly improve after day 19 when vancomycin and cefepime were switched to ceftriaxone. Although he was found to have co-infection with *H. influenzae*, this pathogen was sensitive to the cefepime the patient had been receiving.

**4. Conclusion**

To our knowledge, this is the second reported case of *G. vaginalis* isolated from a pulmonary culture and the first in a previously healthy, immunocompetent young male outside of the urinary tract. Our case demonstrates an unusual source of pulmonary infection and highlights the importance of proper microbial isolation to guide treatment.

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