



Case report

Perigenital necrotizing soft tissue infection caused by *Aerococcus urinae*

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ABSTRACT

Aerococcus urinae can cause severe invasive infections emanating from the urinary tract especially in older males with comorbidities. Here we describe a case of an 80 year-old man with multiple comorbidities presenting with a peri-penile abscess and signs of severe infection. Upon incision *A. urinae* was isolated in pure culture and the infection was cured by a combination of drainage and antimicrobials. This case demonstrates the potential of *A. urinae* to cause severe soft tissue infections in predisposed individuals.

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Introduction

Aerococcus urinae is a Gram positive coccus that shares features both with streptococci and staphylococci. Before the introduction of mass-spectrometry based species determination in bacteriology laboratories, it was difficult to correctly identify the bacterium [1,2]. *A. urinae* is believed to be part of the normal urethral flora [3,4] and has been increasingly recognized as a pathogen capable of causing urinary tract infections [5,6]. Especially in elderly men, *A. urinae* is also known to cause severe and invasive infections including urosepsis and infective endocarditis [7–10]. A few reports on soft tissue infections caused by *A. urinae* have been published including one case of anal abscess with bacteremia [8], one case of balanitis, one case of penile and scrotal phlegmon after catheter misplacement [11], and one case of necrotizing urethritis [12]. Here we describe a case of perigenital necrotizing soft tissue infection caused by *A. urinae*.

Case report

An 80 year-old institutionalized man with severe dementia, status post poliomyelitis, prior alcohol overconsumption, epilepsy and a chronic urinary catheter was admitted to the Emergency Room (ER) with a left groin and scrotal infection. He was reported to have had a 12 h history of fever, increasing drowsiness and 6 h without passing of urine. Due to dementia no self history was given at the ER and the urinary catheter was noticed missing. The patient had multiple prior ER visits due to him cutting or in other ways

removing the catheter. Contact with the referral institution revealed that 3 months prior, in a similar event of auto-removal, the catheter could not be replaced likely due to a urethral stricture. The patient could then pass urine spontaneously. The general practitioner decided the best option was to evaluate the situation without catheter and instructed the nurses to evaluate urine production upon changing the patients diaper.

Upon arrival at the ER the patient was drowsy. Blood pressure was 90/57 mmHg and pulse was 102/min. Respiratory rate was 21/min and oxygen saturation was 95%. He was afebrile (36.1°C) likely due to that paracetamol had been given at the institution. Upon examination a swollen, red and tender left groin, scrotum and perineum was noted. There were no signs of gangrene in the skin. Examination further showed signs of lower abdominal pain but no peritonitis. Rectal examination was normal. A residual urinary volume of 580 mL was demonstrated using ultrasound. Serum creatinine was 2.0 mg/dL (tripled compared to prior values), CRP was 360 mg/L, serum lactate was 5.3 mM, and white blood cell count was 14,000 cells per μ l. A normal catheter could not be placed due to obstruction in the urethra and the patient received a 12 French suprapubic catheter at the ER. Blood and urine cultures were secured and treatment with piperacillin-tazobactam 4 g every 8 h initiated. He was then admitted to an immediate CT-scan on the suspicion of an incarcerated hernia or deep-seated infection.

CT showed a swelling in the perineum and scrotum but no hernia and no signs of gas in the tissues. Due to the severe dementia a decision by the senior urologist on call was made to limit care and exclude the patient from intensive care. It was also decided not to take the patient to the operation room directly. He was instead admitted to the ward with intravenous antimicrobials and fluid treatment. The inflamed area was frequently examined and borders were marked with a pen. During the following 48 h the

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systolic blood pressure fluctuated between 70 and 110 mmHg despite fluid therapy. The pulse was normalized and the patient did not develop fever. The general condition was initially improved and the inflamed area did not expand or darken. Blood cultures were negative. Ultrasound on the second day showed a 2,5 × 5 × 4 cm abscess left of the root of the penis. The general condition of the patient deteriorated on the third day and CRP increased to 523 mg/L. The patient was admitted for surgical drainage and due to suspicion of anaerobic infection metronidazole 1.5 g was given.

Surgery with a scrotal incision was performed around 96 h post admission. An area with pus corresponding to the ultrasound findings was removed. It was surrounded by a grey, black, and yellow necrotic area reaching from the perianal perineum, behind the unaffected left testicle and towards the left base of the penis. The necrosis did not affect the skin itself. For exposure of the laterodorsal infected tissue the left testicle had to be removed and the incision was extended towards the left base of the penis. A lump of necrotic material was removed reaching from the perineum, through the scrotum to the left base of the penis. Cultures were obtained from this mass. The perineal urethra was exposed and had to be cleared of necrotic material and a perioperative iatrogenic hole in the urethra was sutured. Rectoscopy was normal. The cranial part of the wound was closed and the lower part was left open.

Tissue cultures from the operation grew *A. urinae* (confirmed with MALDI TOF-MS score >2) in pure culture. The antimicrobial sensitivity results demonstrated the expected sensitivity to beta-lactams, vancomycin and ciprofloxacin. MIC for clindamycin was 0.25 mg/L (species specific breakpoints not established). The patient steadily improved and daily wound care in the ward followed. After a total of nine days of piperacillin-tazobactam treatment, per oral treatment was initiated with ciprofloxacin 500 mg twice daily and clindamycin 300 mg three times daily for another 10 days. Nine days after the initial surgical treatment the wound was closed leaving only 1 cm in perineum for secondary healing. The cavity was then with no remnant signs of infection. After 15 days treatment the patient was discharged. Recovery from the infection was uneventful.

Discussion

A. urinae resides in the urinary tract and can cause severe infections especially in elderly males. The most common severe type of infection is bacteremia in conjunction with either urinary tract infection or with infective endocarditis. This case demonstrates that *A. urinae* can also cause severe tissue infections in the genital area of predisposed individuals. As for most cases of invasive infections with *A. urinae* [9] this patient had a urinary tract catheter. *A. urinae* is known to form biofilms on foreign surfaces and can likely colonize catheters and subsequently spread to surrounding tissues [13].

The clinical presentation of the patient described in this report was too benign to be regarded as Fournier's gangrene and instead, upon conservative treatment, an abscess developed. Despite that the local infection did not cause extensive tissue destruction, the patient was systemically affected and demonstrated signs of organ dysfunction including renal, central nervous system and circulatory failure. The renal failure however was likely at least in part due to urinary obstruction since serum creatinine levels were normalized (0.75 mg/dL) three days into the treatment despite progressing infection.

The monomicrobial culture from the abscess strongly suggests that *A. urinae* was the causing pathogen in this case. As expected, the bacterium was sensitive to most antimicrobials

and cure was likely dependent mainly on surgical drainage rather than on antibacterial treatment. In this case, a combination of ciprofloxacin and clindamycin was used as peroral treatment but likely a peroral beta-lactam such as amoxicillin would have been equally effective.

Due to patient comorbidity and ethical decisions, the case demonstrates a significant delay in surgical treatment. Surgery was initiated only when medical treatment failed. CT scan is inferior to ultrasound in the perineal/scrotal area and the abscess was not diagnosed at the primary CT scan from the ER. A medical treatment path was initiated and due to initial improvement in the clinical condition of the patient the result of the ultrasound did not immediately alter that path. In this specific case earlier diagnose of the abscess may have initiated an earlier surgical treatment and as a general rule a 4 cm abscess requires surgical drainage.

This case demonstrates that in frail elderly patients, bacteria that most often are part of the normal flora or cause superficial infection can give rise to severe infection leading to organ dysfunction. An individualized approach to treatment needs to be made, but source control is always pivotal for cure of infection.

Written informed consent was obtained for publication of this case report. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

AF and MW treated the patient. MR provided expertise on aerococci and wrote the background. AF and MR wrote the manuscript and MW contributed in this process.

Authorship declaration

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