Inflammation and infection

A rare case of emphysematous spongiositis following urethral catheterization: A case report

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ABSTRACT

Local emphysematous changes with infection in the corpus spongiosum of the penis are extremely rare. Herein, we describe a case of emphysematous spongiositis with urethral catheterization in a patient who had a history of neurogenic bladder. A 67-year-old male was successfully treated with cystostomy and antibiotics for emphysematous spongiositis. Computed tomography (CT) revealed the presence of irregular catheterization and gas formation in the spongy body of the penis. After 8 days of parenteral antibiotic therapy, the laboratory findings improved. Quick treatment via cystostomy and the use of appropriate antibiotics after diagnosis with CT is important in emphysematous spongiositis.

Introduction

Emphysematous urinary tract infections are rare and may lead to fulminating sepsis if not treated on time, leading to the death of the patient. Emphysematous pyelonephritis, one of the most common emphysematous infections, is a urologic emergency characterized by infection, which is caused by enteric gram-negative bacillus, such as Escherichia coli; it is usually noted in patients with diabetes mellitus and obstructive uropathy.1 Emphysematous spongiositis is extremely rare. Therefore, the etiology, diagnosis, and management of this condition as well as other emphysematous infections are discussed in this report.

Case presentation

A 67-year-old male was admitted to our hospital with a history of gross hematuria and fever. He had a medical history of injury to the cervical spine C4/5 due to a fall from a stepladder at the age of 45. Subsequently, he developed a neurogenic bladder and was administered with intermittent self-catheterization for 21 years. A 16Fr urethral indwelling catheter was used for 8 months until hospitalization with periodical exchanges every 4 weeks. The day before the hospitalization, the urethral catheter was changed as usual, but the patient developed hematuria and fever after the final exchange.

Laboratory data revealed the following findings: hemoglobin, 8.1 g/dL; total leukocyte count, 46560 × 10³/dL; neutrophils, 93.2%; C-reactive protein, 3.57 mg/dL; random blood glucose, 232 mg/dL; serum urea, 27 mg/dL; creatinine, 1.29 mg/dL; serum sodium, 135 mmol/L; and serum potassium, 3.7 mmol/L. The urinalysis revealed an abundance of red blood cells with proteinuria and glycosuria. Streptococcus agalactiae were grown on urine cultures and were found to not be sensitive to minocycline. The perineum of the patient was slightly swollen and flared, but sore was not clear by traumatic hemipla. X-ray revealed the presence of gas bubbles with low permeability around the urethral catheter (Fig. 1), and non-contrast CT images revealed gas formation around the urethra along with inflammation and ballooning, resulting in the deviation of the urethra (Fig. 2).

The urethral catheter was immediately removed and cystostomy was performed under ultrasonography and photofluorography with contrast medium. The patient was treated with intravenous Doripenem, 1.5 g per day for 8 days. The laboratory data demonstrated improvements immediately after the treatment; therefore, no further invasive treatment was required. Follow-up after 13 days showed no clinical abnormality and the radiographic findings were normal. The patient was discharged with follow-up from the Urology Outpatient Department.

Discussion

Emphysematous spongiositis, infection of the corpus spongiosum of the penis, is extremely rare with only one case reported in the literature.2 To the best of our knowledge, this is the second case reported in the world. Generally, in addition to diabetes, several patients have urinary tract obstruction associated with urinary calculi or papillary necrosis with significant renal functional impairment.3 In the present report, the patient had a urethral obstruction after using a urethral catheter. Both cases of emphysematous spongiositis reported in the literature responded to treatment and recovered from emphysematous
infection. Nonetheless, the overall mortality rate is reported to be high in patients with pyelonephritis. Almost all documented cases of emphysematous pyelonephritis have occurred in adults. Usually, this condition occurs in patients with diabetes; therefore, it is presumed that the high levels of glucose provide the substrate for the organisms, such as E. coli, which produce carbon dioxide by fermenting sugar. The patients often complain of fever, vomiting, and flank pain. Pneumaturia is absent unless the infection progresses. E. coli is the most commonly identified bacteria in urine cultures. Our patient did not have diabetes mellitus or urinary symptoms like pneumaturia, and the urine cultures indicated the presence of S. agalactiae.

Emphysematous pyelonephritis, a representative of emphysematous infection, is a surgical emergency. The condition is severe in most patients, and fluid resuscitation and adequate antimicrobial therapy are essential. Medical therapy is generally required to address the renal function in these patients. In the present study, the urethral catheter was immediately removed and cystostomy was performed along with the prescription of antibiotics.

In the previous report, the cause of infection in the 63-year-old male with diabetes mellitus was unclear. In contrast, the patient in the present study presented with iatrogenic urethral obstruction and severe local infection in the spongy urethra. Currently, 2 years after cystostomy, the patient is well and undergoing periodic exchange of the catheter with no evidence of recurrence of the disease. Patients with urethral infection need to rest to recover from the condition.

Conclusion

Emphysematous infection is a life-threatening disease characterized by the formation of gas within the tissue. Emphysematous spongiositis is extremely rare, and quick treatment via cystostomy and the use of accurate antibiotics is important following an accurate diagnosis using CT images.

Declaration of competing interest

The authors declare no conflict of interest.

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