

# A Case of Native Hip *Pseudomonas aeruginosa* Septic Arthritis Caused by Vesico-acetabular Fistula

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## ABSTRACT

A 61-year-old man with a past medical history significant for metastatic rectal cancer treated with local resection, chemotherapy, and radiation complicated by vesico-cutaneous fistula presented with subacute ambulatory dysfunction secondary to right hip pain. Imaging studies were consistent with a right hip effusion, and fluoroscopy-guided hip aspiration revealed septic arthritis caused by *Pseudomonas aeruginosa*. Resistance patterns identified this strain of *Pseudomonas* to be the same one that caused pyelonephritis that was treated during the same hospitalization. Although further diagnostic imaging was not pursued, the presentation was most consistent with vesico-acetabular fistula causing native hip septic arthritis. This is a very rare complication of radiation therapy that serves as a reminder to keep a broad differential for atypical presentations in patients who have undergone extensive local radiation.

## INTRODUCTION

Pelvic radiation therapy is commonly part of a multimodal therapeutic approach for malignancies involving abdominopelvic organs. While it can be effective, it has also been associated with many complications stemming from damage to surrounding structures, including radiation-induced colitis/proctitis, ureteral strictures, and various types of fistulae<sup>1</sup>.

While many types of fistulae have been characterized and reported, vesico-acetabular fistulae are relatively rare. Here, we present a case of a 61-year-old man who had undergone treatment for rectal cancer with pelvic radiation approximately 1 year prior to presenting with native hip septic arthritis caused by a vesico-acetabular fistula.

## CASE REPORT

Our patient had metastatic rectal cancer that was treated with rectal tumor resection, chemotherapy, and pelvic radiation 5 years prior to presentation. Due to local recurrence, he was once again treated with chemotherapy and pelvic radiation (3,600 centi-gray over 30 fractions) one year prior to presentation. Over the following year, he developed a large vesico-cutaneous fistula that resulted in persistent drainage of urine from his perineum.

Treatment for this complication was attempted with implantation of bilateral percutaneous nephrostomy tubes intended to divert urine from the bladder, but perineal drainage of urine persisted. One year after undergoing radiation, he presented to the hospital with acute on chronic kidney disease, fever, pyelonephritis, and ambulatory dysfunction secondary to right hip pain. He was also experiencing increased drainage of urine from his perineum, and he reported that his urine had become foul-smelling. Recent outpatient magnetic resonance imaging of the right hip, which was obtained following a fall, demonstrated stable osteoarthritis with a new right hip effusion and right iliopsoas bursitis.

Vital signs on presentation included temperature 101.5 F, heart rate 86 beats per minute, respiratory rate 16 breaths per minute, blood pressure 109/60 mmHg, and oxygen saturation 99% on room air. Physical exam was significant for cachexia and a clean perineal wound that was notably draining foul-smelling urine with no associated surrounding soft tissue changes. Right hip examination was significant for tenderness to palpation along the greater trochanter as well as pain with micromotion. Full range of motion could not be tested secondary to significant pain and guarding. Initial labs were significant for creatinine 3.4 mg/dL (baseline 2.0 mg/dL), white blood cell count 7.5 B/L with a normal differential, and hemoglobin 6.4 g/dL (baseline 8.0 g/dL) - the rest of his basic metabolic panel and complete blood count were unremarkable. Urinalysis showed 2+ blood, 3+ leukocyte esterase, negative nitrites, and >182 WBC per high powered field. Urine cultured from bilateral percutaneous nephrostomy tubes prior to exchange grew *Pseudomonas aeruginosa* susceptible to most antibiotics. Blood cultures drawn on the same day remained negative for 5 days.

He was treated for pyelonephritis with cefepime and his bilateral percutaneous nephrostomy tubes were exchanged. Due to his progressive ambulatory dysfunction, continued fevers, and recent right hip MRI demonstrating a right hip joint effusion, there was high concern for septic arthritis of the right hip. At this time, C-reactive protein and erythrocyte sedimentation rate were 18.3 mg/dL and 91 mm/hr respectively. He underwent fluoroscopy-guided aspiration of the right hip, which revealed cloudy fluid with a white blood cell count of 30,974 per uL (95% neutrophils) and a glucose

of 26 mg/dL; cultures of this fluid grew *Pseudomonas aeruginosa* with the same antimicrobial resistance pattern as that in his urine. While no diagnostic studies were undertaken to directly assess the presence of a fistulous tract between the bladder and the hip, this was thought to be the most plausible explanation for his pathology given his history. Orthopedic surgery was consulted, and he underwent right hip arthrotomy with debridement and washout. During the procedure, they encountered and debrided an abscess in the rectus femoris as well as copious purulent fluid within the right hip capsule. A fistulous tract was not directly visualized at the time of surgery. The patient did not experience any immediate complications from the surgery. While the patient's pain did improve significantly following this intervention, he did not regain significant ambulatory function secondary to failure to thrive, and he unfortunately passed away on hospice shortly after discharge from the hospital.

## DISCUSSION

This case highlights the unique anatomical complications that can occur in patients with soft tissue tumor invasion, especially following extensive local radiation. Our patient presented with subacute hip pain caused by septic arthritis secondary to likely vesico-acetabular fistula. No diagnostic study directly visualized the fistulous tract, but it is the most plausible explanation given the patient's history. Osteomyelitis with ensuing septic arthritis can occur due to hematogenous seeding, but this patient's blood cultures were never positive, and he had known fistulous connections between his bladder and other pelvic structures as a result of radiation. It is interesting to note that this patient's septic arthritis presented with no signs of systemic inflammation aside from persistent fevers, elevated ESR, and elevated CRP, all of which can be difficult to interpret in the setting of advanced metastatic disease<sup>2</sup>.

Fistulae between the bladder and various surrounding structures in the setting of pelvic radiation are not uncommon and have been reported on extensively in the literature<sup>1</sup>. It is also known that fistulae are more likely to occur as complications of surgery in the setting of prior pelvic radiation, but our patient did not have any prior surgical procedures that could predispose him to pelvic fistulization.

While there are a number of cases of vesico-acetabular fistulas reported in the literature, all that we reviewed were in the setting of primary hip pathology and as a complication of hip surgery<sup>3,4,5</sup>. These generally occur within a few months to years after radiation. In our case, it was 1 year after radiation, but it has been reported as far out as 35 years following radiation<sup>6</sup>. We did not find any other cases of vesico-acetabular fistulae associated with pelvic radiation.

## CONCLUSION

We believe our case to be a unique example of the type of complication that can occur in the setting of locally invasive malignancy managed with radiation. The most important takeaway from this case is that the anatomy of an irradiated area can become significantly altered, and pathology arising from this should be carefully considered when dealing with problems involving these areas. Significant morbidity can arise from these changes in anatomy, and earlier identification and treatment can enable more expedient treatment and prevent further complications.

## REFERENCES

1. Morris KA, Haboubi NY. Pelvic radiation therapy: Between delight and disaster. *World J Gastrointest Surg*. 2015 Nov 27;7(11):279–88.
2. Kallio R, Bloigu A, Surcel H-M, Syrjälä H. C-Reactive protein and erythrocyte sedimentation rate in differential diagnosis between infections and neoplastic fever in patients with solid tumours and lymphomas. *Support Care Cancer*. 2001 Mar;9(2):124–8.
3. Jones ALC, Acher P, Cynk M. Vesico-acetabular Cutaneous Fistula: A Delayed Complication of Hip Surgery. *Urology*. 2011 Aug;78(2):323–4.
4. Tolkach Y, Gadjevi N, Korol V, Gonchar I. Vesico-Acetabular Fistula and Urolithiasis in the Hip Joint Cavity due to Persistent Bladder Entrapment after Acetabular Fracture. *Korean J Urol*. 2011;52(3):221.
5. Vishwanath J, Ng YP, Teo YS, De SD. Vesico-Hip Fistula from Bladder Puncture with Subsequent Infected Total Hip Arthroplasty. *The Journal of Arthroplasty*. 2007 Sep;22(6):939–41.
6. Sharma A, Kurtz MP, Eswara JR. Three distinct urethral fistulae 35 years after pelvic radiation. *Nephrourol Mon*. 2014 Mar;6(2):e14197.