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Spinal Epidural Abscess Following Prostate Biopsy

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Abstract

Contemporary transrectal ultrasound (TRUS)-guided prostate biopsy is safely carried out with only minor complications such as infection and hemorrhage. Severe infection is seldom observed and spinal epidural abscess (SEA) following TRUS-guided prostate biopsy is extremely rare. Here we report a case of a 69-year-old man presenting with SEA following TRUS-guided prostate biopsy.

He was admitted with acute bacterial prostatitis following TRUS-guided prostate biopsy. The culture of blood and urine yielded *Escherichia coli* (*E. coli*). Despite of administering antibiotics sensitive to *E. coli*, CRP remained elevated and he experienced neck pain and weakness of the extremities three weeks later. Magnetic resonance imaging (MRI) revealed pyogenic spondylodiscitis at the C4/5 level and an epidural abscess from the C3 to C6 level. Immediate surgical drainage was performed and systemic antibiotic therapy was continued for 6 weeks. His neck pain resolved and his motor nerve disorder recovered. When inflammation following prostate biopsy lasts long despite of appropriate antibiotic treatment, there can be secondary unusual infection that should be diagnosed early. Fever, back pain with/without neurological impairment is clinical features of SEA and immediate MRI is recommended. Emergent surgical drainage with systemic antibiotic therapy was able to prevent the severe progression of the neurological complications.

Keywords: Epidural abscess; Prostate biopsy; Infection; Complication; MRI

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Introduction

Diagnosis of prostate cancer is established by histologic evaluation of prostatic tissue. Transrectal ultrasound (TRUS)-guided prostate needle biopsy is the gold standard method for detecting prostate cancer and is one of the most common procedures in urology. Contemporary TRUS-guided prostate biopsy can be safely carried out with a risk of only minor complications such as infection or hemorrhage [1,2]. Major complications are seldom observed and spinal epidural abscess (SEA) is an extremely rare following TRUS-guided prostate biopsy. Here we present the case and review the literature.

Case Presentation

A 69-year-old diabetic man underwent 12-core TRUS-guided prostate biopsy with prophylactic levofloxacin (500mg, p.o., s.i.d) in an outpatient clinic. The procedure itself was performed without any problem. He suffered from high fever and chills with shivering the following day and was admitted to the department of urology 2 days after the prostate biopsy. He was diagnosed with acute bacterial prostatitis and meropenem was administered. His fever peaked after two days. The cultures of both urine and blood yielded *Escherichia coli* (*E. coli*), which were resistant to levofloxacin. Based on the antibiotic susceptibility of the bacterial strain, the antibiotic was de-escalated to cefazolin. However, CRP remained elevated (>5.5mg/dL). Two weeks after admission, he complained of neck pain but computed tomography (CT) performed at the time did not show any problem at his neck. Three weeks after admission, he had high fever again and was unable to walk by himself because of weakness of the upper and lower extremities. Emergently performed MRI disclosed pyogenic spondylodiscitis at the C4/5 level and an epidural abscess from the C3 to C6 level (Figure 1). Surgical debridement was performed immediately. The fragile vertebral body was curetted and the defect was substituted with a bone graft from his left ilium. *E. coli* was found in the culture from the spinal abscess, which was corresponding to the previous urine and blood cultures. He received

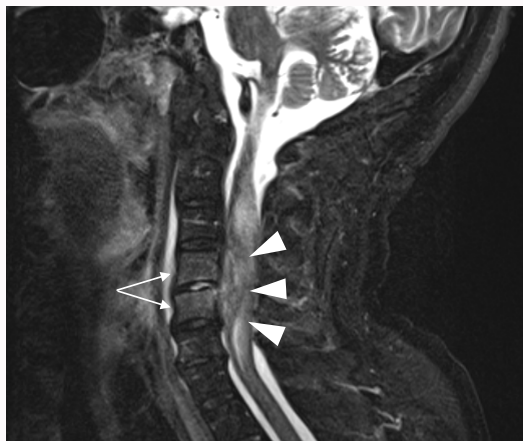


Figure 1: Magnetic resonance imaging (short T1 inversion recovery shows the hyperintense lesion of vertebral bodies at the C4/5 level (arrows and the hyperintense epidural lesion, extending from the C3 to C6 level (arrow heads).

postoperative antimicrobial treatment: intravenous ceftriaxone 2g, twice daily for the first 6 weeks, followed by oral ampicillin and amoxicillin/clavulanic acid for the next 6 weeks. With regard to his neurologic symptoms, the neck pain resolved immediately after surgical drainage. Ten days after the operation, he recovered from the motor paralysis of the lower extremities and was able to walk by himself. Owing to intensive rehabilitation, his motor disabilities were completely recovered on postoperative day 50. However, peripheral paresthesia remained as of 6 months after the TRUS-guided prostate biopsy.

Discussion

Minor complications such as hematuria, rectal bleeding, urinary retention and infection are well known following TRUS-guided prostate biopsy, whereas severe complications are rare [2]. In Japan, the incidence rate of febrile infection after TRUS-guided prostate biopsy is 1.1% and the incidence rate of sepsis is 0.07%². To our knowledge, this is the first case report of SEA following prostate biopsy in Japan.

The incidence rate of SEA from any cause is only 0.2–1.96 cases/10,000 hospital admissions [3]. The clinical triad in patients with SEA comprises fever, back pain and neurological abnormality [4-6]. However, all of these symptoms are seldom present simultaneously

at the time of presentation [6,7]. In the typical clinical course, back pain and fever occur as the first presentation, followed by neurologic impairment [4-6].

There have been reports of bacteria gaining access to the epidural space through hematogenous dissemination (half of cases) as well as of contiguous spread (one third of cases). The source of infection was not identified in the remaining cases [6]. The route of dissemination of the bacteria may have been hematogenous in this case because the same bacterial strain was detected from in the patient’s urine, blood and abscess. In addition, because this infection occurred following prostate biopsy, bacteria was likely to spread through Batson’s venous plexus [8], which is known as a route of dissemination of prostate cancer [9]. The most common site of SEA lesion after prostate biopsy is the lumbar spine [8,10-13] although cervical SEA is relatively rare [14].

The origin of the infectious site in SEA varies. Skin and soft tissue infections appear to be the most common, accounting for about one fifth of established sources [15]. However, SEA from the prostate is uncommon. To our knowledge, there have been only six case reports of SEA following prostate biopsy published in the English literature [8,10-14] (Table 1). All patients underwent not transperineal but transrectal prostate biopsy. One or a few days following prostate biopsy, all patients had back pain or fever. Subsequently, they had continued severe back pain or presented with additional neurologic deficits as the part of the clinical triad of SEA. Four of the six patients had neurological abnormalities and these neurological signs appeared considerably later. Indeed, it took more than 4 weeks to diagnose SEA from prostate biopsy.

The most useful modality to diagnose SEA is MRI [16], by which all six patients were diagnosed [8,10-14]. MRI is also an effective modality to detect other coexisting vertebral inflammation such as spondylodiscitis [8,10,11,13] and osteomyelitis [12]. MRI should be performed if the SEA or vertebral infection is suspected following prostate biopsy.

Treatment of SEA requires surgical drainage and treatment with systemic antibiotics [6]. All SEA patients following prostate biopsy underwent surgical drainage as soon as the diagnosis was established and received antibiotics such as ceftriaxone and meropenem for at least 4 weeks [8,10-14]. It has been recommended to perform immediate decompression of abscess and drainage of infected tissues before neurologic symptoms progress because the degree of

Table 1: Reported clinical studies of SEA following transrectal ultrasound (TRUS)-guided prostate biopsy.

Reported year	Author	Age	Coexisting infectious disease	Clinical triad†	Interval from PB to diagnosis	Pathogen	Treatment	Antibiotics for SEA	Sites of SEA	Outcome
2004	E Tasdemiroglu [10]	53	pyogenic spondylodiscitis	full	5 weeks	<i>E. coli</i>	drainage	CTRX, GM	L2/3	recovered
2005	V Fradet [14]	54	ARDS	without backpain	10 days	<i>E. coli</i>	drainage	CTX	cervical	recovered
2009	H Karapolat [11]	70	spondylodiscitis	full	6 weeks	<i>E. coli</i>	drainage	CEZ	T6/7	ameliorated
2012	M Kaya [8]	59	pyogenic spondylodiscitis	without neurologic impairment	6 weeks	<i>E. coli</i>	drainage	SBT/AMPC, AMK	L3 to S2	recovered
2013	M J Roberts [12]	61	prostate abscess, osteomyelitis	without neurologic impairment	not reported	<i>E. coli</i>	drainage	CTRX	L4/5	ameliorated
2015	G Dobson [13]	69	spondylodiscitis	full	4 weeks	<i>E. coli</i>	drainage	MEPM	L3/4	not reported
2017	Present case	69	pyogenic spondylodiscitis	full	3 weeks	<i>E. coli</i>	drainage	CTRX	C3 to C6	ameliorated

†: Including of Back Pain, Fever and Neurologic Impairment; PB: Prostate Biopsy; SEA: Spinal Epidural Abscess; ARDS: Acute Respiratory Distress Syndrome; *E.Coli*: Escherichia Coli; CTRX: Ceftriaxone; GM: Gentamicin; CTX: Cefotaxime; CEZ: Cefazolin; SBT/AMPC: Sulbactam/Ampicillin; AMK: Amikacin; MEPM: Meropenem.

preoperative neurologic disorder is the most important predictor of the final neurologic deficit [5,7]. Vancomycin is the best choice of empiric therapy for SEA in general because *Staphylococcus aureus* is the most commonly involved organism (62–70%), followed by *Streptococcus* spp. (7%), and *E. coli* (3–4%) [4]. Of note, sulbactam/ampicillin, ceftriaxone and meropenem have been chosen in SEA following TRUS-guided prostate biopsy because the SEA bacteria detected following prostate biopsy have all been *E. coli* [8,10-14].

The outcomes of patients with SEA after prostate biopsy are shown in Table 1. All patients except one recovered without neurological disability. In our case, the patient has recovered from motor disorder but peripheral paresthesia has remained. It is important for urologists to be aware of the possibility of SEA following infection due to prostate biopsy and to diagnose it as soon as possible for immediate appropriate treatment.

Conclusion

SEA after TRUS-guided prostate biopsy is extremely rare, but prompt diagnosis is essential for successful treatment because it is capable of causing neurological complications that linger for a long time. When the clinical features such as fever, or back pain with/without neurological impairment appear following prostate biopsy, immediate MRI is recommended to diagnose SEA or other vertebral infections. Emergent surgical drainage with systemic antibiotic therapy is necessary for patients with SEA to prevent the progression of neurological complications.

Consent

Written consent was obtained from the patient for this case report.

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