Neisseria gonorrhoeae paravertebral abscess

Case report

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The authors present the case of an isolated gonococcal paravertebral abscess with an epidural component in a 42-year-old man. A primary epidural abscess of the spine is a rare condition and is most commonly caused by Staphylococcus aureus. In this report, the authors present their therapeutic decisions and review the relevant literature on disseminated gonococcal infection in a patient presenting with an epidural abscess.

A 42-year-old Indonesian man was admitted with symptoms of neck and upper back pain and bilateral lower-limb weakness. Clinical examination was unremarkable apart from tenderness over the lower cervical spine. Postgadolinium T1-weighted MRI of the cervical and thoracic spine demonstrated an enhancing lesion in the right paraspinal and epidural soft tissue at C-6 to T1–2, in keeping with a spinal epidural abscess. The patient underwent laminectomy of C-7 and T-1 with abscess drainage. Tissue cultures subsequently grew Neisseria gonorrhoeae that was resistant to quinolones by genotyping. Upon further questioning, the patient admitted to unprotected sexual intercourse with commercial sex workers. Further investigations showed that he was negative for other sexually transmitted infections. Postoperatively, he received a course of beta-lactam antibiotics with good recovery. Clinicians should be aware of this unusual disseminated gonococcal infection manifested in any patient with the relevant risk factors. (http://thejns.org/doi/abs/10.3171/2012.4.SPINE11914)

Key Words • paravertebral abscess • epidural abscess • Neisseria gonorrhoeae • infection

Epidural abscesses are uncommon conditions, as the reported global incidence approximates up to 2 cases per 10,000 people.19 Predisposing factors include recent spinal surgery, trauma, immunosuppression, diabetes mellitus, and intravenous drug use.9 The most common organism isolated is Staphylococcus aureus, which accounts for up to 90% of all cases.22

This case report illustrates an unusual cause of an epidural abscess due to Neisseria gonorrhoeae in a patient with undiagnosed diabetes mellitus who eventually admitted to high-risk sexual behavior. There is only one other reported case of gonococcal epidural abscess in the literature to our knowledge, as DGI rarely involves the axial skeleton.31 We reviewed the literature and highlighted the clinical and radiological features and risk factors of DGI in the context of a spinal epidural abscess.

Case Report

History and Examination. A 42-year-old Indonesian
A man was admitted with symptoms of upper-back pain associated with mild bilateral lower-limb weakness that had been present for a month. He denied prior trauma to his neck and did not have any significant medical history. There were no bowel or urinary symptoms. A physical examination was unremarkable apart from tenderness over the lower cervical spine from C-7 to T-2. There were no focal neurological deficits or loss of sensation in the upper or lower limbs, and anal tone was normal.

Initial blood investigations were significant only for a raised white blood cell count of 12.74 × 10⁹/L, an ESR of 65 mm/hour, and a CRP of 134 mg/L (normal < 5 mg/L). In addition, he was found to have diabetes mellitus with a random glucose of 13.2 mmol/L and glycated hemoglobin of 11.1%, for which insulin therapy was commenced. Moreover, blood cultures demonstrated no bacterial growth.

Magnetic resonance imaging of the cervical and thoracic spine revealed a right posterior paraspinal and epidural soft tissue mass with a thin layer of enhancement at the level of C-6 to T-2 without cord compression. No definite neuroforaminal extension was seen, but there was spinal canal stenosis without CSF space effacement. Radiological findings were compatible with a local inflammatory process (Figs. 1 and 2).

**Treatment.** The patient underwent a decompression laminectomy of C-7 and T-1 and was found to have an epidural abscess and spinal abscess with frank pus in the spinal canal and paravertebral muscles. Extensive debridement was done.

**Posttreatment Course.** An infectious disease consult was sought, and the patient was empirically started on high-dose intravenous cloxacillin (12 g/day) for a presumed *S. aureus* infection. A central catheter was peripherally inserted in anticipation of a prolonged course of antibiotics. The initial Gram stain from the cervical spine tissue samples was unremarkable, with 4+ (numerous or more than 25 hpf) pus cells, 1+ (few or less than 1 hpf) epithelial cells, and no microorganisms. These tissues were then plated onto blood, chocolate, and MacConkey agars. No growth was observed on the initial two readings; however, on the third reading, there were small gray colonies on both the blood and chocolate agar plates. Gram smear of the colonies showed gram-negative diplococci. Carbohydrate utilization testing via the API NH kit (bioMérieux) was positive for glucose but negative for maltose, sucrose, and lactose. MicroTrak direct immunofluorescence antibody testing (Trinity Biotech Plc) confirmed the presence of *N. gonorrhoeae*. The isolate was found to be sensitive to ceftriaxone via Vitek 2 (bioMérieux). Genotyping of the isolate for antibiotic resistant genes was done by pulsotypes generated by pulsed field gel electrophoresis. The primers used for the polymerase chain reaction amplification specific for *gyrA* and *parC* were the same as those used by Tanaka et al. The DNA was digested by the restriction enzyme Spel. The isolate was found to have 5 mutations in *parC* at codons 73 (Val73Glu, GTG→GAG), 87 (Ser87Asn, AGT→AAT), 91 (Glu91Lys, GAG→AGG), 131 (Leu131Leu, CTG→CTG), and 139 (Leu139Leu, CTG→CTΔ), indicating high levels of ciprofloxacin resistance.

The patient was promptly started on intravenous ceftriaxone (2 g daily) with a week of oral doxycycline (100 mg twice daily) for possible concomitant nongonococcal urethritis. He admitted to unprotected contact with commercial sex workers. His urine NAAT for chlamydia and gonorrhea was negative. Hepatitis B and C, syphilis, and HIV serologies were also negative. A urethral swab did not grow any genitourinary pathogens. His complement levels were normal, and he had no immunological evidence of underlying systemic lupus erythematosus. The team also repeated routine blood cultures, which remained negative for bacterial growth. The patient was subsequently treated in our outpatient antibiotics parenteral therapy unit, where he completed a total of 4 weeks of intravenous ceftriaxone uneventfully. His CRP was < 5 mg/L and ESR was 8 mm/hour on discharge from the outpatient antibiotics parenteral unit. His wife was also screened and had a urine NAAT positive for chlamydia. She was treated with a single dose of intramuscular ceftriaxone and 1 g of azithromycin orally. The couple was subsequently treated in our outpatient antibiotics parenteral therapy unit. She was treated with a single dose of intramuscular ceftriaxone and 1 g of azithromycin orally. The couple was well at the follow-up 4 months after his procedure and returned to Indonesia without seeking medical attention in Singapore for any recurrence of the illness in the last 3 years.

**Discussion**

The majority of patients with epidural abscesses re-
**Neisseria gonorrhoeae** paravertebral abscess

![Fig. 2. Axial postcontrast T1-weighted MR image obtained at T1–2, demonstrating a posterior right paraspinal component of soft tissue enhancement (thick arrow) and a layer of enhancing epidural soft tissue (thin arrow) causing mild spinal canal stenosis.](image)

Infectious epidural abscesses are a rare and severe complication of sexually transmitted infection. Disseminated gonococcal spinal cord. In general, a careful history and physical examination should be implemented to prevent irreversible damage to the affected area so that surgical intervention may be considered. Surgical decompression and drainage is imperative for the management of this condition, even at presentation. The classical triad of mild pain, fever, and neurological deficit is often not found, suggesting antibiotic resistance. 31

**Fig. 2.** Axial postcontrast T1-weighted MR image obtained at T1–2, demonstrating a posterior right paraspinal component of soft tissue enhancement (thick arrow) and a layer of enhancing epidural soft tissue (thin arrow) causing mild spinal canal stenosis.

Although gonococcus has been associated with a wide array of clinical syndromes, the majority of patients with DGI present with one of two syndromes: a triad of dermatitis, tenosynovitis, and polyarthralgias without septic arthritis, or purulent arthritis without dermatological disease. Other rare complications include endocarditis, meningitis, and osteomyelitis. Affected joints commonly reported in the literature involve the extremities, commonly the knees, wrist, ankles, and elbows in decreasing order of frequency. Infections that involve the axial skeleton are rare.

To our knowledge, our case is the first in which an isolated gonococcal abscess involving the spine and adjacent structures without any other systemic manifestations has been reported in the literature (as determined by a search of the PubMed database for articles published from 1971 to September 2011 and their references). The initial case report was a 30-year-old Australian man who had an epidural abscess associated with significant tenosynovitis of his hands as well as urogenital symptoms. He was treated with a week of intravenous ceftriaxone and a subsequent 4 weeks of oral ciprofloxacin.

There has been no consensus regarding the duration of treatment for DGI involving the axial skeleton given that reports are exceedingly rare. Notably, the duration of treatment used in both our case and the only previous case report was shorter than the conventional antibiotic duration of at least 6 weeks for spinal or vertebral abscesses caused by other organisms such as *S. aureus*. This may be attributed to the high susceptibility of gonococcus to the beta-lactam group of antibiotics, although this may not be true in the future. In general, however, for infections related to the axial skeleton, antibiotics should always be tailored to the identity and sensitivity of the perpetrating organism. Parenteral therapy should be commenced initially in the acute setting prior to a switch to oral therapy. The duration of antibiotics will depend on the normalization of inflammatory markers, which typically requires a minimum of 6 weeks with follow-up.

Of concern is the rising incidence of antimicrobial resistance of *N. gonorrhoeae* globally. In the 2004 Gonococcal Isolate Surveillance Project in the US, 6.8% of 6322 gonorrhea isolates were resistant to quinolones (minimum inhibitory concentrations > 1.0 µg/ml), and this rose to 13.3% by June 2006. In the year 2004 in Singapore, 50% of 160 isolates of *N. gonorrhoeae* demonstrated antibiotic resistance. Because of the emergence of quinolone-resistant *N. gonorrhoeae*, the Centers for Disease Control and Prevention in the US in their April 2007 guidelines did not recommend quinolone use for the treatment of gonorrhea. Ceftriaxone, as was used in our patient, or cefotaxime or ceftezoxime are currently recommended for DGI.

At present, therapy for a gonococcal infection de-
pends on the severity of disease, resistance patterns of organisms in specific geographical locales, exposure and toxicity of the drugs, and the potential site of infection. As the pathophysiology of DGI remains obscure, one should endeavor to prevent STDs. Overall patient care should include the treatment of sexual contacts and conscientious follow-up evaluation. Future control of this disease must be based on a multifaceted strategy of effective drug treatment, increased laboratory bacteriological surveillance, and strict contact tracing. In addition, physicians should also screen for other STDs and HIV as a standard.

Our patient had an excellent clinical response to combined medical and surgical treatment as well as a prompt decline in his inflammatory markers. We did not have a good oral option, as cefixime and cefpodoxime, which are available in many other countries, are not available in Singapore. Ideally, patients should be followed up after the cessation of antibiotics so that their inflammatory markers can be closely monitored. It was difficult to do so in our case, as the patient asked to return to Indonesia despite our advice to stay on for follow-up. However, because he did not report any relapse of symptoms after 4 weeks of parenteral therapy, we believed it was safe for his continuity of care to be transferred to his home country.

Conclusions

Neisseria gonorrhoeae should be considered as an etiological agent when an epidural abscess develops in a high-risk patient without genitourinary symptoms. In contrast to staphylococcal, tuberculous, or other gram-negative vertebral osteomyelitis, a short course of antibiotic treatment after surgical intervention appears to be adequate. Hence, early identification and appropriate treatment are essential for a good outcome. Future concerns will include antibiotic resistance and medication limitation, as drug-resistant DGI, especially in the context of an epidural abscess, can be devastating for the patient.

Disclosure

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