Spontaneous Cervical Paraspinal and Epidural Giant Abscess in a Child
—Case Report—

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Abstract
A 10-year-old girl presented with a very rare paraspinal and spinal epidural abscess manifesting as fever, and neck pain and stiffness. Initially, she was treated under a diagnosis of meningitis for 3 weeks. However, she developed monoparesis of the right upper extremity, and was referred for neurosurgery. Magnetic resonance imaging revealed an epidural and paraspinal lesion intensely enhanced by gadolinium. The patient underwent urgent surgery for C2–3 laminectomy and abscess drainage, followed by broad spectrum antibiotic therapy. She was discharged and followed up in the outpatient clinic. Two months later, the paraspinal abscess recurred with great increase in size. A second operation was performed and 150 ml pus was drained. *Streptococcus anginosus* was grown in the culture. The patient fully recovered after long-term targeted antibiotic therapy. Such abscesses are very rare in children, especially in the cervical region. The correct diagnosis can be difficult to establish but early treatment is essential for a good prognosis.

Key words: paraspinal abscess, spinal epidural abscess, child

Introduction
Paraspinal and spinal epidural abscesses are very rare in children, especially in the cervical region.9) The diagnosis is generally delayed because the patients tend to present with non-specific symptoms. Paraspinal and spinal epidural abscesses commonly occur in the mid-thoracic or lower lumbar spine, usually after lumbar puncture, epidural anesthesia, or spinal surgery.1,3) Cervical epidural and paraspinal abscesses are often mistaken for meningitis. Delay in the correct diagnosis may lead to permanent neurological deficits or even death.2,4)

Systemic infection, or sepsis, and transient inoculation of the blood stream with bacteria, bacteremia, are the most common causes of paraspinal infections due to deposition of bacteria in areas adjacent to the spine. Infections of the organs of the neck, chest, and abdomen can all lead to abscess formation in and around the spine.4,7,8,11) Acute paraspinal infections are most commonly caused by *Staphylococcus aureus*.4,8,9) Severe pain is caused in the affected region of the spine. Fever and chills usually develop. Mobility of the affected spine is usually restricted, and movements typically produce severe muscle spasms. If the infection invades the spinal canal, epidural abscess may develop.9) The treatment of choice is urgent surgical drainage of paraspinal abscess. Surgical drainage of epidural abscess requires single or multiple laminectomy. The patient’s neurological status at the time of diagnosis is the most accurate predictor of outcome and prognosis.2,6,7,10)

We treated a child who developed spontaneous cervical epidural and paraspinal abscess and discuss the problems of early diagnosis and effectiveness of definitive surgical and medical treatment.

Case Report
A 10-year-old girl presented with neck pain, tenderness, and stiffness with decreased mobility, fever, and acedia. She had a history of local bulging and pain in the neck. The initial diagnosis of meningitis was established by a pediatrician based on the neck stiffness and fever. She was admitted to our hospital. After 20 days of medical therapy, her body temperature remained high, her conscious level was...
depressed, and she developed monoparesis of the right upper extremity. Cervical magnetic resonance (MR) imaging showed a paraspinal and epidural abscess with significant compression on the spinal cord at C2–3, with intense enhancement following intravenous gadolinium administration (Fig. 1). She was then transferred to our department.

Biochemical and hematological investigations showed slightly increased white blood cell count, erythrocyte sedimentation rate, and C-reactive protein level. Neurological examination identified paralysis in the distal part of right upper extremity, in addition to the neck stiffness and fever. Hypoesthesia was present in the C-2 to the C-6 dermatomes on the right. The triceps and biceps reflexes were hyperactive on the right. We could not find any origin for the systemic infection.

She underwent urgent surgery within 24 hours of the onset of paralysis. C2–3 laminectomy was performed, followed by abscess drainage. No specific microorganism was grown in the culture. Therefore, she was given a combination of antibiotics to cover a wide spectrum of microorganisms: ampicillin + sulbactam, amikacin, and cefotaxime. After the surgical drainage and a long-term (6 weeks) course of intravenous antibiotics, the patient fully recovered. She had no symptoms or neurological deficits during this period.

Two months later, she presented to the accident and emergency department with fever, neck pain, local tenderness, stiffness, and a bulging mass, and was admitted to our hospital. Cervical MR imaging performed urgently showed a giant paraspinal and epidural abscess, with intense enhancement following intravenous gadolinium administration at the same level (Fig. 2). The patient underwent another surgical drainage procedure. Approximately 150 ml pus was drained. Streptococcus anginosus was grown in the culture. This organism was sensitive to vancomycin, amikacin, and cefotaxime. After 7 weeks of antibiotic administration, repeat cervical MR imaging showed no abscess (Fig. 3). She has remained asymptomatic and follow-up examination after 3, 7, and 12 months showed no pathology.

**Discussion**

The history of our patient suggested that the abscess originated in the local skin infection of her neck. Presumably the patient had a streptococcal skin infection with an episode of bacteremia which led to hematogenous spread.
Staphylococcus aureus was the causative organism in 79% of pediatric cases. Streptococcal skin infection is the second most common causative organism of spinal epidural abscess and paraspinal abscess.\textsuperscript{8) In our patient, the causative organism was Streptococcus anginosus.} Empirical antibiotic therapy should include coverage of gram-positive cocci, in particular staphylococci, as well as gram-negative bacilli. Third-generation cephalosporins offer excellent gram-positive and gram-negative coverage, as well as central nervous system penetration.

The abscess recurred in our patient. The most probable reasons were the size, the route of transmission, and the delayed diagnosis. No further abscesses developed after the first surgery and long-term antibiotic therapy was administered.

Epidural and paraspinal abscess should be suspected in all patients with fever, and neck stiffness and tenderness until proven otherwise.\textsuperscript{4) Misdiagnosis and delayed diagnosis are very common in cases of paraspinal and epidural abscess, resulting in increased morbidity and mortality.\textsuperscript{11) One of two patients was treated under an early diagnosis and recovered well, whereas the other was treated under a delayed diagnosis and developed permanent neurological deficit.\textsuperscript{2) Our case was treated under a misdiagnosis of meningitis due to fever and neck stiffness. Paraspinal infection was suspected only after paresthesia occurred. The possibility of spinal or cerebral abscess should be considered in patients with meningitis refractory to treatment.

MR imaging is the first choice for paraspinal and epidural abscess, but single photon emission computed tomography may be more sensitive.\textsuperscript{5,12) In our case, we used MR imaging with gadolinium which is useful for detecting the anatomical details of paraspinal and epidural abscesses and the degree of spinal cord compression as well as the changes in adjacent tissues.

The treatment for epidural and paraspinal abscess remains undefined. Long-term antibiotic therapy is recommended after surgical debridement. Small epidural and paraspinal abscess may be treated conservatively.\textsuperscript{2,10) The neurological status of the patient at the time of diagnosis is the best predictor of neurological outcome, and morbidity increases if surgery is delayed. Therefore, urgent surgery must be performed within hours if cord compression occurs.\textsuperscript{2,6,10) We treated our patient with abscess drainage and laminectomy together with long-term antibiotic treatment. This case illustrates the difficulty of establishing the correct diagnosis for treatment of this condition.

References


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