

Obstetric Forum

Piriformis pyomyositis mimicking epidural abscess in a parturient

Anna M. Kinahan MD, M. Joanne Douglas MD

A case is presented of a patient who developed fever, leukocytosis, severe back pain, local overlying spinal tenderness, and left leg weakness on the fifth day postpartum. The patient had epidural anaesthesia for ten hours duration, before and during a forceps delivery. Computerized axial tomography (CT) and magnetic resonance imaging (MRI) of the pelvis and lumbar spine revealed swelling of the left iliacus and piriformis muscles, but no epidural abscess. A diagnosis of isolated piriformis pyomyositis with secondary sciatic nerve irritation was made, and the patient was treated with intravenous antibiotics, non-steroidal anti-inflammatory agents, and morphine analgesia. She made a full, uneventful recovery within 50 days, and was discharged requiring no medications.

Au cinquième jour post-partum, une patiente présente de la fièvre avec leucocytose, de la lombalgie importante avec une douleur locale et une faiblesse du membre inférieur gauche. Cette patiente avait bénéficié d'une anesthésie épidurale d'une durée de dix heures, avant et pendant son accouchement aux forceps. La tomodynamométrie et l'imagerie par résonance magnétique du bassin et de la colonne lombaire montrent une tuméfaction des muscles iliaque et piriforme gauches sans abcès épidural. Un diagnostic de pyomyosite du piriforme avec irritation du nerf sciatique est porté et la patiente traitée aux antibiotiques intraveineux, aux anti-inflammatoires non stéroïdiens et à la morphine. La récupération est complète après 50 jours et elle obtient son congé sans autre médication.

Key words

ANAESTHESIA: obstetric;

ANAESTHETIC TECHNIQUES: epidural;

COMPLICATIONS: epidural abscess, pyomyositis.

From the Division of Obstetric Anaesthesia, Faculty of Medicine, University of British Columbia, British Columbia's Women's Hospital, 4490 Oak Street, Vancouver, British Columbia V6H 3V5.

Address correspondence to: Dr. A. Kinahan.

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The neurological complications of an acute epidural abscess develop rapidly. The cardinal findings are severe back pain, local overlying spinal tenderness, fever and leukocytosis. Although epidural abscesses are rare, the complications are so serious that prompt diagnosis and treatment are essential.

Surgery is indicated when a progressive neurologic deficit is present. A laminectomy should be performed at an early stage, to relieve nerve root and cord compression from an epidural mass.

Case history

A previously healthy 22-yr-old woman, G₂A₂P₀, was admitted at 40 wk gestation in early labour, after spontaneous rupture of the membranes. Her pregnancy was complicated by gestational thrombocytopenia and her admission platelet count was $95 \times 10^9 \cdot L^{-1}$.

Labour progressed slowly and was augmented with oxytocin. Upon request, an epidural catheter was inserted at the L₃₋₄ intervertebral space for analgesia. Following removal of the needle, the catheter was withdrawn 2 cm, leaving 4 cm in the epidural space. Frank blood was aspirated through the catheter, so it was removed, and reinserted at the L₂₋₃ intervertebral space.

An epidural test-dose with 45 mg lidocaine and 15 µg epinephrine, showed no evidence of vessel puncture or subarachnoid injection. The patient required five top-ups, one every 2½ hours. Top-ups alternated between bupivacaine 0.25% (8 ml) and bupivacaine 0.125% with added 1/800,000 epinephrine (12 ml). During the final four hours of labour bupivacaine, 0.125% was infused at a rate of 10 ml · hr⁻¹.

Ten hours after epidural insertion, she delivered a 4700 g male infant, with the aid of outlet forceps, and sustained a right lateral perineal tear. The estimated blood loss was 800 ml. Immediately post-partum she developed a fever of 39°C; blood, urine, and vaginal cultures were taken and she was treated with a single dose of ampicillin 2 g iv. On post-partum day one she had increased blood stained lochia but no fever. On post-partum day three she spiked a fever of 39°C and was treated empirically

with ampicillin 500 mg *po* qid. She complained of cramp-like lower abdominal pain and had five bouts of watery diarrhoea, dysuria, and rigors, so cephalexin 500 mg *po* qid was added the following day. Blood and urine cultures were negative but vaginal swabs (taken on admission) cultured *Group B Streptococcus* and *Enterococcus faecalis*. Her white blood cell count was $22.4 \times 10^9 \cdot L^{-1}$ with $1.7 \times 10^9 \cdot L^{-1}$ band cells. The haemoglobin concentration decreased from 120 to 94 mg $\cdot dl^{-1}$ but all other blood work, including electrolytes and creatine phosphokinase concentrations, was normal.

On post-partum day five she suddenly developed pain over the left trochanteric area with weight bearing. The pain subsequently subsided, but recurred two hours later, waking her from sleep. She was unable to move her left leg because of the increasing severity of "knife-like" buttock, low back, and hip pain. She refused to move her leg, but denied paralysis, parasthesias, headache, photophobia or meningismus. On examination, she was pale, diaphoretic and appeared toxic. Vital signs were BP 120/70 mmHg, pulse 112 bpm, respiratory rate $20 \cdot min^{-1}$, and temperature $39.1^\circ C$. She was lying supine with the left leg in 10 degrees abduction. Deep tenderness was provoked by light pressure over the left gluteal area and on rectal examination. Straight leg raising and Bowstring tests were positive. The initial neurological examination was normal. Twenty-four hours after the initial examination, ankle and knee jerks on the left side were decreased. She had normal muscle tone and down-going plantar reflexes. Following neurosurgical and neurology consultations, urgent imaging studies were obtained. On ultrasound examination of the pelvis, bladder and bowel distension were noted; and a contrast-enhanced CT scan of the lumbar spine showed no evidence of epidural abscess. The patient had no sensation of bladder distension, but urinary catheterization produced 2700 ml of urine.

Over the next several days, the WBC count continued to be elevated (Table) and she continued spiking temperatures to $39.9^\circ C$ (Figure), and imipenem 1 g *iv* q 8 hr was started. Repeat contrast-enhanced CT and MRI of the pelvis and lumbar spine showed no evidence of extradural abscess, but a diffuse swelling of the left iliacus and piriformis muscles suggestive of "myositis" was noted. Her major problem was of ongoing pain, limiting her ability to ambulate. Intramuscular anileridine, morphine and meperidine were ineffective in relieving the persisting low back and hip pain.

Intravenous patient-controlled analgesia (PCA) with morphine was used to provide analgesia for 11 days which was then switched to ibuprofen *po*. Repeat contrast-enhanced CT scans of the lumbosacral area, 20 days and one month postpartum, showed resolution of the piriformis

TABLE White blood cell count vs time

Post-partum day	WBC $\times 10^9 \cdot L^{-1}$
0	10.84
2	22.37
7	12.89
8	15.11
9	14.64
10	16.37
12	14.0
18	14.38
20	5.80
42	5.83
49	5.78

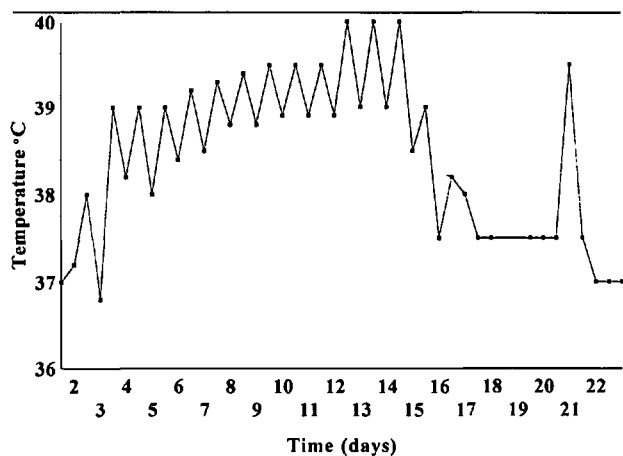


FIGURE Temperature vs time.

mis and iliacus muscle swelling with an enlarged left sacroiliac joint, possibly secondary to sacroiliitis.

She made a full recovery after six weeks of intravenous antibiotic therapy and was discharged home receiving no medication, 50 days postpartum.

Discussion

The incidence of spinal epidural abscess is 0.2–1.2 per 10,000 hospital admissions.¹ Heusner described the clinical picture of an epidural abscess in four phases: spinal ache; root pain; weakness; and paralysis.² The differential diagnosis of backache and local spine tenderness (in addition to epidural or subdural haematoma and abscess) includes intervertebral disc pathology, such as degenerative disc disease, spinal cord tumours, acute transverse myelopathy, osteomyelitis, meningitis, and vascular lesions.

This patient's presentation was suspicious of epidural abscess because of the spiking temperature pattern, elevated white blood cell count, and excruciating low back pain extending from L₃₋₄ to the sacrum. General malaise, chills, rigors, spiking temperatures and an elevated white

blood cell count, beginning three to five days postpartum, are consistent with infection. Although she gave no history of disc or low back problems, she had pain over the posterior left thigh, buttock, and posterolateral left leg; findings compatible with sciatica. Mild left leg weakness, diminished deep tendon reflexes, lumbosacral tenderness, paraspinal muscle spasm, and urinary retention in the presence of sepsis, increased the possibility of an epidural space infection.³

Contrast-enhanced CT scan of the lumbar spine and pelvis was initially normal, but one week later showed swelling of the left iliacus and piriformis muscles. The diagnosis was therefore compatible with inflammatory myositis, probably pyogenic in nature.⁴ The source of the infection could have been acquired by direct extension from her perineal laceration (forceps trauma) or from a transient bacteraemia arising from the genitourinary or gastrointestinal tracts. Chorioamnionitis with transient bacteraemia was a possible source, as she had a history of spontaneous rupture of membranes over 24 hr, and vaginal cultures grew *Group B streptococcus*. Blood cultures, however, were continually negative perhaps because of the early institution of antibiotic therapy.

Pyomyositis is a suppurative inflammation of muscle usually due to *staphylococcus* or *streptococcus* and is seen mainly in the tropics.⁵ It is rare to see single muscle involvement with this diffuse inflammatory condition. Isolated piriformis pyomyositis, secondary to *staphylococcus*, has been described in one case from Taiwan and it was managed surgically with incision and drainage.⁴

The piriformis muscle syndrome with secondary sciatic nerve irritation has also been described.⁶ Since the sciatic nerve lies just inferior to the piriformis muscle within the pelvis, swelling of the piriformis muscle pushes the sciatic nerve anteriorly, entrapping it between the piriformis and the gemellus superior muscles. The aetiology of the piriformis muscle syndrome is believed to be trauma to the muscle, leading to irritation, inflammation, spasm and muscle hypertrophy.

With a history of gestational thrombocytopenia, and a traumatic epidural insertion, blood in the epidural space could have served as a nidus of infection. The reported incidence of blood vessel puncture after placement of a catheter into the lumbar epidural space in obstetric practice appears to vary between 1 and 10%.⁷ Crawford has reported one case of an epidural abscess arising in a pre-existing epidural haematoma.⁸ In that case an unsuspected streptococcal bacteraemia, originating from a vaginal infection, led to infection of a haematoma in the epidural space. The symptoms of an epidural abscess developed 16 days postpartum and a laminectomy was required to relieve the condition.

An epidural space infection usually represents a sec-

ondary site of infection from either direct extension of vertebral osteomyelitis or haematogenous spread from a primary infection of skin, lungs, or genitourinary tract.⁹ Rarely is an epidural infection or abscess due to direct epidural injection.⁹

In conclusion, an unusual case of isolated piriformis pyomyositis of indeterminate aetiology was presented. The patient's presentation had many features in common with an acute epidural abscess. Prompt clinical assessment and appropriate radiological studies are necessary to rule out spinal cord compression because emergency surgery may be required.

COMMENTARY

Kari G. Smedstad MB FRCPC

*Department of Anaesthesia, McMaster University,
Hamilton, Ontario.*

This case illustrates that a needle in the back is not necessarily the cause of all ailments that befall our patients. A high incidence of suspicion is always prudent, however; we must train ourselves to look beyond "the epidural" and entertain a range of differential diagnoses when complications occur.

There are several "red herrings" in the case discussed:

- 1 The patient had gestational thrombocytopenia, with a platelet count of $95 \times 10^9 \cdot L^{-1}$. This, in itself, is not really a complication, but a common finding in otherwise healthy parturients. It is not a contraindication to epidural analgesia. But then a "bloody tap" happens, as it does in the best of hands, and the anaesthetist immediately gets a bit worried. What if she develops a haematoma?
- 2 The patient then delivers a very large baby with a perineal tear. Did she have an episiotomy as well? She immediately spikes a temperature of 39°C but has a normal white cell count. This suggests acute bacteraemia. There are signs of infection; white cell count elevation, fever and positive cultures in the post-partum period.
- 3 There is a considerable decrease in haemoglobin concentration and one thinks of infections and/or bleeding.

It is very reasonable to suspect that an epidural abscess or haematoma may form under these circumstances.

Piriformis syndrome is usually seen in chronic pain clinics and occurs after trauma, and it is usually non-pyogenic. The syndrome presents with pain in the buttock and in the posterior thigh, but there may also be low back pain, and radiation down the leg to the foot, mimicking sciatica. Myofascial trigger points are found in the

buttock or by vaginal examination in the lateral wall of the vault. The clinical presentation of sudden incapacitating leg and back pain, associated with signs of infection, in a patient with a low platelet count, dictates that an epidural mass must be ruled out first. The lack of neurological signs is reassuring, however, and should lead to a complete examination of the musculoskeletal system. Modern imaging techniques are helpful in ruling out epidural space-occupying lesions, but not all centres have instant access to CT scanners and MRI machines. Therefore, we must continue to hone our old-fashioned clinical examination skills. The CT scan helped confirm the diagnosis here. Other diseases that may present in this way are acute sacroileitis due to brucellosis, or yersinia; or secondary to Reiter's syndrome. Spontaneous epidural abscesses and haematomas also occur, but if the epidural space has been entered, one always gets the blame for such complications. A patient of mine, who had an implanted epidural catheter and port for pain relief from colon cancer, developed neurological signs and pain on injection and an epidural abscess was suspected. During laminectomy, no pus was found, however, the tumour had spread widely in the epidural space and the spinal cord became compressed with each injection.

This report is very instructive. Although one is unlikely to see a similar case, the authors have taught us to assess all the clinical evidence critically, use appropriate tools of investigation (where available) and make the right diagnosis before subjecting the patient to unnecessary and potentially dangerous invasive procedures.

COMMENTARY

Terrance W. Breen MD FRCPC

Department of Anaesthesia, Foothills Hospital and University of Calgary, Calgary, AB.

This case report highlights several issues in obstetric anaesthesia. The parturient had a low platelet count; likely due to gestational thrombocytopenia, a benign condition affecting approximately 7–8% of the obstetric population.¹⁰ Regional anaesthesia in thrombocytopenic patients is controversial. As platelets form the initial "plug" in a traumatized blood vessel, many anaesthetists are concerned about initiating bleeding in the epidural space in the parturient with thrombocytopenia.

The platelet count below which epidural catheter insertion becomes unsafe is unknown although the figure of $100 \times 10^9 \cdot L^{-1}$ is often suggested. Small, retrospective studies have reported epidural analgesia in thrombocytopenic patients without adverse sequelae.^{11,12} In my clin-

ical practice, I examine not only the platelet count, if it is available, but also the rate of change in the platelet count. Many believe that epidural analgesia is safe in patients with a stable count of $50\text{--}100 \times 10^9 \cdot L^{-1}$. In contrast, a rapidly decreasing platelet count in a patient with pre-eclampsia is generally of more concern. In these situations the advantages of epidural analgesia (analgesia, restoration of plasma volume, improved placental perfusion, blood pressure control and avoidance of airway manipulation) may or may not outweigh the theoretical concerns of epidural haematoma.

There is no good screening test to predict the safety or hazard of epidural catheter insertion in thrombocytopenic patients. The bleeding time has been used but there is good evidence that it is not a useful screening test.¹³ Alternative methods of assessing coagulation and, possibly, the risk of epidural haematoma include thromboelastography and the sonoclot test, but their ability to predict the risk of bleeding reliably is not known. History and physical examination are often all that is available before epidural catheter insertion and are usually all that is necessary. At Foothills Hospital we no longer do a routine CBC on labouring patients. Coagulation status is assessed only when indicated on clinical grounds (pre-eclampsia, abruptio placenta, etc.) and we believe this is safe.

Of greater interest in this patient is the possible diagnosis of epidural abscess. Last year a patient presented to Foothills Hospital with an epidural abscess one week after delivery. Her case is interesting in that it provides a contrast to this existing case report.

Our patient had uneventful epidural analgesia for labour but became febrile the following day. Blood and urine cultures were done and antibiotic therapy started. The results of the cultures were negative and the patient was discharged on the second day postpartum (PP) with a prescription for oral cephalexin, which was never filled. Four days later (PP day six) she presented to the emergency department with flank pain. As she was afebrile and had a normal physical examination she returned home. The next morning she returned with fever, $38.2^\circ C$, and back pain. A neurologist examined her eight hours later and an emergency MRI scan showed an abscess at L₂₋₃. Emergency decompressive laminectomy was undertaken. After surgery she required bladder catheterization and had some persistent lower extremity weakness which steadily improved over two weeks. She was then discharged but did not return for follow-up visits.

Epidural abscesses account for approximately 1 in 10,000 hospital admissions.¹ Some of the associated factors are older age, immunocompromise, infection, intravenous drug use, and trauma.¹⁴ Most cases are unrelated

to anaesthesia but the number of case reports after spinal or epidural anaesthesia has increased recently. Of those related to epidural anaesthesia few have involved obstetric patients,¹⁵ despite the large number of obstetrical epidural procedures.

Historically, the diagnosis of epidural abscess has been made with myelography, a tool with high sensitivity.^{1,16} Unfortunately, it is not specific (only shows CSF obstruction) and there are concerns about infection and pressure gradients when performing the lumbar puncture.¹⁷ Scanning with CT is useful, but its sensitivity is less than myelography unless intrathecal contrast is used. Magnetic resonance imaging (MRI) scans were initially less effective than myelography but with the advent of contrast enhancement (gadolinium) they have equivalent sensitivity.¹⁸ In addition, MRI is non-invasive and can be used to diagnose other conditions producing similar symptoms and signs.

There is no uniform agreement on the management of epidural abscess. Most authors suggest surgical drainage and antibiotic treatment in all patients but others advocate medical therapy, at least in a selected patient population (poor surgical candidate, extent of abscess, minimal or no neurological deficit, complete paralysis for >three days).¹⁹ There are no randomized, controlled trials to recommend any one method.²⁰ When medical therapy is undertaken it is important to have the correct bacteriological diagnosis from blood cultures and from aspiration of the abscess cavity, when possible. Ready access to appropriate imaging equipment and neurosurgical back up are required before embarking on medical management. When there is progressive neurological dysfunction, decompressive laminectomy is the treatment of choice. Close clinical follow-up, irrespective of the method of treatment, is essential as neurological deterioration has occurred following medical and surgical management.²¹ Urgent diagnostic imaging is required when neurological status deteriorates and prompt surgical intervention is usually required.

Although the patient presented by Kinahan and Douglas did not have an epidural abscess, the symptomatology was compatible with that diagnosis. Due to its rarity and nonspecific presentation anaesthetists should maintain a high level of suspicion that an epidural abscess may occur in postpartum women after epidural anaesthesia. Primary care physicians should also be aware of this possibility so that the diagnosis can be made promptly and treatment started before permanent neurological injury occurs.

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