

Discordant lumbar epidural hematoma after caudal steroid injection

A case report (CARE-compliant)

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Abstract

Rationale: Caudal epidural injection is one of the conventional treatments of chronic back pain. Even though spinal epidural hematoma after caudal epidural injection is rare but it can cause serious neurologic complication.

Patient concerns: An 83-year-old woman taking cilostazol received caudal epidural steroid injection because of her chronic back pain. Six hours later, she experienced an acute hip pain which worsened with time.

Diagnosis: Magnetic resonance image showed acute cord compression due to a spinal epidural hematoma at L2–S1 level with concomitant central canal compromise at L2/3, L3/4 level.

Interventions: Emergency decompressive laminectomy and evacuation of the lumbar epidural hematoma were performed.

Outcomes: All of her symptoms were resolved over the 72 hours following surgery.

Lessons: Continuous vigilance after caudal epidural injection is important to prevent catastrophic neurologic deterioration with early detection and early treatment.

Abbreviation: MRI = magnetic resonance image.

Keywords: caudal epidural injection, cilostazol, lumbar epidural hematoma

1. Introduction

Caudal epidural injection is a procedure commonly applied to patients with chronic low back pain caused by disc herniation, radiculitis, or spinal stenosis.^[1,2] This procedure is known to have low complication rate.^[1] Clinical investigation of 257 cases of fluoroscopy-guided caudal block in 139 patients noted that 15.6% developed minor complications such as insomnia, transient headache, aggravation of back or leg pain, facial flushing, vasovagal reaction, or nausea, but no major complication was reported.^[3] Other clinical studies reported complications that were confined to the anatomical structure of the injection site, such as cauda equina syndrome or intravascular injection during or after caudal injection.^[4,5]

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Even though spinal epidural hematoma is a rare complication, but it is potentially catastrophic due to neurologic sequelae. In an analysis of 33,142 nonobstetric epidural blocks, spinal epidural hematoma occurred in 1/6628 cases.^[6] Case reports described that in most case spinal epidural hematomas were localized in the site of injection.^[7,8]

To our best knowledge, no previous reports have shown a lumbar epidural hematoma after caudal injection. We report an experience of lumbar epidural hematoma that is not matched with the injection site after caudal steroid injection.

2. Case report

This report was approved by Institutional Review Board of Gil Hospital, and written informed consent was provided by the patient. An 83-year-old woman was diagnosed with lumbar spinal stenosis with bulging of the intervertebral discs from L2 to L5. She had a history of chronic back pain for over 10 years and took medicine without invasive interventions or operative procedures. She was pharmacologically treated with nonsteroidal antiinflammatory drugs and benzodiazepines for over 10 years. A physical exam showed a local tenderness around L5 and S1 vertebrae without motor or sensory deficits. She received a lumbar epidural steroid injection via interlaminar approach at L5/S1 level 7 months prior, which relieved her back pain for time. However, the recurrence of pain at the same spinal levels led to her admission to our hospital.

Her medical history included type-2 diabetes, atrial fibrillation, and old CVA, for which she was taking cilostazol, a phosphodiesterase type 3 inhibitor. Laboratory findings showed normal electrolytes, hematocrit at 39.7%, platelets at 178,000/

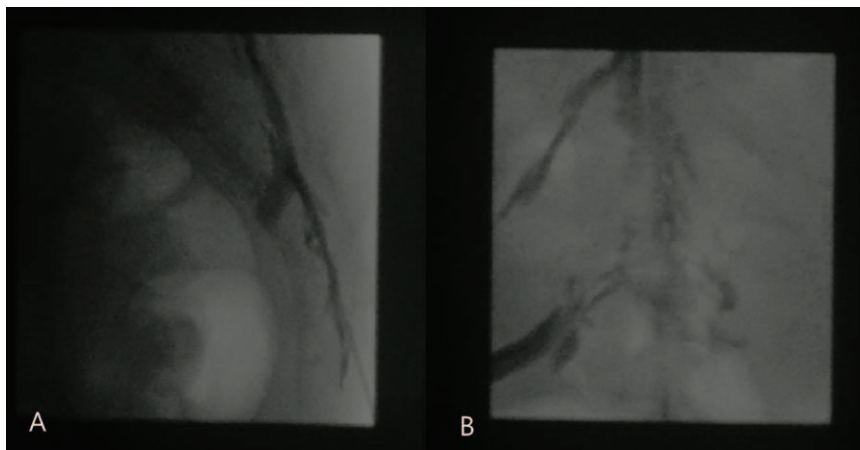


Figure 1. Lateral (A) and antero-posterior (B) fluoroscopic images during caudal steroid injection.

mm³, prothrombin time at 10.2 seconds, activated partial thromboplastin time at 33.2 seconds.

A caudal epidural injection was performed under fluoroscopic guidance. The patient was asked to lie prone on a fluoroscopic table. A pillow was placed under the hips to tilt the pelvis and bring the sacral hiatus into greater prominence. The sacrococcygeal area was prepared using an iodine-based povidone solution and an alcohol solution. Three milliliter of 2% lidocaine was infiltrated using 25G needle to prevent puncture pain. We used a 22-gauge, 3.5-inch spinal needle. After penetrating 3 cm of skin, we checked the absence of blood in the syringe before advancing the needle. We injected 1 mL of contrast media before drug injection. After correctly positioning the needle, 0.2% lidocaine with 1 mg of dexamethasone in 15 mL total volume was injected. One hour after injection she experienced a reduction of back pain (Fig. 1). Three days after the caudal injection, the patient came to the outpatient clinic and complained of newly developed severe burning pain radiating into both hips, and difficulty standing. She complained that the symptom started about 6 hours after the caudal injection and worsened with time. A full neurological assessment revealed no weakness in the patient's trunk and lower limbs, and no other changes.

An urgently checked lumbar spine magnetic resonance image (MRI) showed acute cord compression due to a spinal epidural hematoma at L2–S1 level with concomitant central canal compromise (severe at L2/3, L3/4 level) (Fig. 2). Emergency decompressive laminectomy and evacuation of the hematoma was performed uneventfully over 4 hours. Her symptoms resolved over the 72 hours following surgery. She had no further signs or symptoms of radiculopathy and returned to normal daily activity after 6 weeks.

3. Discussion

We describe an experience of discordant lumbar epidural hematoma after caudal steroid injection in a patient with chronic back pain. The frequency of spinal hematoma due to epidural steroid injections is unclear. Injected local anesthetics sometimes confuse and delay the diagnosis of epidural hematoma and might lead to the cord ischemia. Neurological impairment after epidural anesthesia is reported in 1/150,000, and 1/220,000 following spinal anesthesia.^[9] A meta-analysis of 613 patients demonstrated that 29.7% of spinal hematoma was idiopathic, and anticoagulant therapy and vascular malformation were the

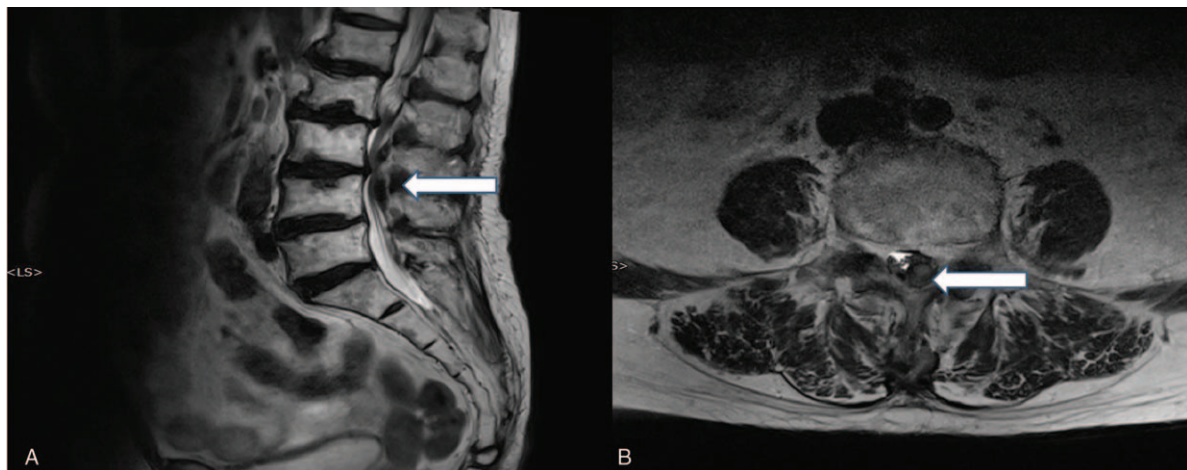


Figure 2. Magnetic resonance image shows spinal epidural hematoma in sagittal T2-weighted image (A) and thecal sac compression by hematoma at axial T2-weighted image (B).

2nd and 3rd most common causes of spinal hematoma. Procedures at the spinal level itself frequently induced spinal hematoma without any further cause.^[10]

Drugs associated with coagulation such as anticoagulants, antiplatelet drugs, and thrombolytics are widely used for the treatment or prevention of stroke, myocardial infarction, pulmonary embolism, and deep vein thrombosis. Our patient had a history of cerebrovascular attack and was taking cilostazol, but no other anticoagulants. Cilostazol is a selective inhibitor of phosphodiesterase type 3 with therapeutic focus on increasing cyclic adenosine monophosphate. An increase in cyclic adenosine monophosphate increases the active form of protein kinase A, thereby directly inhibiting platelet aggregation, and producing a vasodilatory effect by inhibiting myosin light-chain kinase activation.^[11] Cilostazol reduces the risk of stroke by 25.7% relative to aspirin, with significantly less hemorrhagic risk.^[12] According to American Society of Interventional Pain Physicians (ASIPP) guidelines published in 2010, continued use of phosphodiesterase inhibitors, such as dipyridamole, dipyridamole plus aspirin, and cilostazol, does not increase the risk of spinal epidural hematoma after interventional procedures, and discontinuing the medication before the procedure is unnecessary.^[13] A crossover study of 21 patients with peripheral arterial disease demonstrated that aspirin or clopidogrel alone significantly increased bleeding time, but not cilostazol alone. In combination therapy, cilostazole added to any aspirin/clopidogrel regimen did not prolong bleeding time above the significant increase of bleeding time caused by aspirin and clopidogrel.^[14]

However, despite the preinterventional normal laboratory values and not taking other anticoagulant, lumbar epidural hematoma still developed in this case. Thus, close observation is necessary for the patients even if cilostazole is the only medication taken.

Shanthanna and Park^[15] reported an acute extradural hematoma at T10–12 following epidural steroid injection at L3–4 in a patient with spinal stenosis. They explained that tortuous and weakened blood vessels might be ruptured by the injectant. We observed discordant lumbar epidural hematoma separate from the injection site in a patient with long-term multilevel spinal stenosis. In the case of spinal stenosis, because of the narrow spinal canal, the neighboring structures including the venous epidural plexus are under pressure, and this increased pressure can result in veins in the epidural space becoming engorged and tortuous, leading to vessel wall thinning.

Epidural hematoma requires rapid diagnosis and treatment. Rapid decompression surgeries in the case of epidural hematoma are necessary for neurological recovery.^[16] If laminectomy is performed within 8 hours of neurological injury, neurological damage may be reversible.^[17] Therefore, if epidural hematoma is suspected, it is important to immediately diagnose radiographically and to not delay surgical treatment. MRI is preferred as a fast, noninvasive method. The presence of epidural hematoma can be rapidly diagnosed by MRI, and its location and vascular malformation can be detected. The degree of cord compression can be confirmed and the timing of hematoma can be predicted.^[18]

In our case, she experienced newly developed radiculopathy without motor weakness. Since we could not rule out epidural

abscess or epidural hematoma, we confirmed using immediate MRI and proceeded with emergency surgery.

In conclusion, the cause of lumbar epidural hematoma following caudal steroid injection in this case was not clear. Possibilities included cilostazole, the underlying spinal stenosis, interventional violence, or a combination of all. In any event, it is important to prevent catastrophic cord injury with early detection and early treatment. Especially in the patients taking medications that can produce bleeding diathesis, close observation is mandatory.

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