

Transient paralysis by loculation of the injectant associated with epidural injection

¹Keun Lee MD, ¹Yong Hun Pee MD, ²Il-Tae Jang MD PhD, ³Kwang Lae Lee MD PhD

¹Departments of ¹Neurosurgery, Joosan Nanoori Hospital, Incheon; ²Department of ²Neurosurgery, Gangnam Nanoori Hospital, Seoul; ³Department of ³Rehabilitation Medicine, Hyomin Care Hospital, Incheon, Korea

Abstract

Transient paralysis occasionally occurs after an epidural injection, but the reasons for this are still unknown. We present here a patient with transient paralysis following loculation of the injectant associated with the procedure. A 50-year-old woman with a history of two previous spinal operations complained of a burning sensation and radiating pain. A caudal block and right S1 transforaminal epidural block were performed. Loculation of the block injectant into the right L5 and S1 epidural space was confirmed through computed topographic imaging. She showed transient weakness of the right lower limb, which completely recovered after 1 day. This case shows that extra care should be taken when performing an epidural injection in a patient with adhesions around the injection site and appropriate adjustments should be made to the volume of the injectant.

Keywords: Paralysis, epidural injection, epidural space, adhesion

INTRODUCTION

Epidural injection is widely used to treat a variety of spinal disorders. However, this procedure is not without risk. Although the complication rate is generally low, complications can still occur. Paralysis is one such complication. There are many reports of persistent paralysis associated with epidural injection.¹ Clinically, transient paralysis happens more commonly than persistent paralysis; however, the reasons are still unknown. The authors of a previous report of a case with epidural injection associated transient paralysis suggested three possible causes: inadvertent thecal penetration, iatrogenic arachnoid cyst and loculation of the injectant.² This is the case report of a patient who had transient paralysis due to the loculation of the injectant after the epidural injection.

CASE REPORT

A 50-year-old woman was admitted for the complain of severe lower back pain with radiation to the right lower limb. She had undergone a partial hemi-laminectomy and insertion of an interspinous process device on the right at the level of L5/S1 to treat a right L5/S1 disc rupture a month previously in another hospital. Her symptoms persisted after the operation. Apart from

the said operation, her past medical history was unremarkable. Magnetic resonance imaging (MRI) showed residual rupture material on the right L5/S1, along with right foraminal and extraforaminal disc herniation at the same level. Posterior lumbar interbody fusion and pedicle screw fixation of the L5/S1 level was performed at the same date. Her severe lower back pain improved after the operation; however, she demonstrated dysesthesia bilaterally in the legs and soles of her feet. The dysesthesia did not respond to medication. On post-reoperative day 13, a caudal block was performed and the dysesthesia improved. She was discharged home the following day.

She visited the outpatient clinic about 5 weeks later, complaining of a burning sensation in both soles and radiating pain to the right posterior thigh and leg. Repeated caudal block and right S1 transforaminal epidural block were planned. A caudal block was performed under fluoroscopic guidance. Before the block, the epidural space was verified using the administration of contrast media (iohexol). The injectant of the caudal block composed of 5mg dexamethasone, 7.5mg ropivacaine and 40mg 0.5% lidocaine. No immediate complications were seen. After about 30 minutes, a right S1 transforaminal epidural injection was performed under computed tomography (CT) guidance. The scout CT image

Address correspondence to: Kwang Lae Lee, MD, PhD, Department of Rehabilitation Medicine, Hyomin Care Hospital, 46 Seochangnamsunhwan-ro 216 beon-gil, Namdong-gu, Incheon 21617, Korea. Tel: 82-32-461-7577, E-mail: 78zzz@naver.com

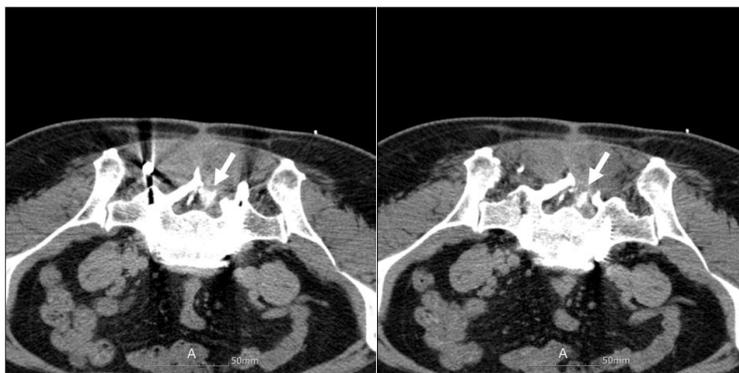


Figure 1. CT imaging showed loculation of the contrast media (arrow) in the right epidural space.

showed loculation of the contrast media on right epidural space, which was used in caudal block (Figure 1). After the spinal needle was located in the S1 transforaminal epidural space, the contrast media was administered. The contrast media showed loculation near the injection site in the epidural space (Figure 2). The injectant composed of 3mg dexamethasone, 5mg ropivacaine and 5mg 0.5% lidocaine was injected into the epidural space. There were no side effects during or immediately following the procedure.

Approximately 1 hour after the procedure, the patient complained of weakness in the right ankle dorsiflexor. The manual muscle test (MMT) result of the tibialis anterior muscle was Medical Research Council (MRC) grade 4. Administration of intravenous normal saline was started. The weakness of the right tibialis anterior muscle

deteriorated and the MMT showed that the muscle power was MRC grade 3. Weakness of the right knee extensor and first toe dorsiflexor muscles then developed. The patient also complained of numbness in the right L5 dermatome. After about 4 hours, weakness of the right knee and ankle muscles was also shown by the MMT (Table 1). An MRI was performed, which did not show any abnormal findings that could be associated with the weakness. She was observed closely. The weakness and numbness completely recovered after 1 day. The bilateral burning sensation in her soles and the radiating pain to the right posterior thigh and leg, which were her chief complaints, also recovered.

DISCUSSION

As mentioned earlier, transient paralysis occasionally occurs after epidural injection. To date, the cause is uncertain; although there is one report that suggested some possible hypotheses.² Another previous study on the complications of transforaminal lumbar epidural injection reported an incidence rate of 0.3% of transient paralysis and suggested the possibility of temporary motor blockage because of concentration of the anesthetic material.³ Our patient showed that transient paralysis can occur due to loculation of the injectant, which was demonstrated by the imaging studies. Other possible causes, such as hematoma, epidural abscess, inadvertent dural puncture, iatrogenic arachnoid cyst, and cord infarction were excluded by the CT and MRI. It is assumed that the loculation was caused by adhesions related to previous spinal surgeries.

The malposition of the advanced spinal needle is one of the general causes of complications from epidural injections. CT guidance provides great anatomical detail including the surrounding



Figure 2. The contrast media (arrow) showed loculation near the injection site without diffusion in the epidural space.

Table 1: The manual muscle test of right lower limb

Muscle	Medical Research Council grade
Knee extensor	3
Knee flexor	3
Ankle dorsiflexor	1
Ankle plantar flexor	2
First toe dorsiflexor	1

soft tissue, nerve roots, and bony structures. This help to facilitates accurate needle insertion.⁴ In this case, loculation of the injectant of the caudal block into the right L5 and S1 epidural space was confirmed through scout CT imaging. Furthermore, the final position of the needle tip in the epidural space during the right S1 transforaminal epidural injection procedure and loculation near the injection site were confirmed through imaging. The full recovery of her chief complaints of a burning sensation and radiating pain supported proper injection into the epidural space. Transient paralysis in this case probably arose from loculation of the injectant into a site with adhesions.

We recommend that when performing an epidural injection on a patient with adhesions around injection site, special care such as re-positioning of the needle or lower volume of injectant should be taken.

In conclusion, transient paralysis can occur as a result of loculation of the injectant after an epidural injection procedure. Special care should be taken when performing an epidural injection in a patient with adhesions around the injection site, and appropriate adjustments should be made to the volume of the injectant.

DISCLOSURE

Financial support: None

Conflicts of interest: None

REFERENCES

1. Thefenne L, Dubecq C, Zing E, *et al.* A rare case of paraplegia complicating a lumbar epidural infiltration. *Ann Phys Rehabil Med* 2010; 53:575-83.
2. McLain RF, Fry M, Hecht ST. Transient paralysis associated with epidural steroid injection. *J Spinal Disord* 1997; 10:441-4.
3. Botwin KP, Gruber RD, Bouchlas CG, *et al.* Complications of fluoroscopically guided

transforaminal lumbar epidural injections. *Arch Phys Med Rehabil* 2000; 81:1045-50.

4. Chandra RV. Computed tomography guidance for spinal intervention: basics of technique, pearls, and avoiding pitfalls. *Pain physician* 2013; 16:369-77.