



## An unusual complication following caudal epidural steroid injection : A case report

Brinda Vihari SOMANCHI, Saeed MOHAMMAD, Raymond ROSS

*From the Spinal Unit, Salford Royal Hospital, Salford, United Kingdom*

**The authors present a case in which paraplegia developed following administration of caudal epidural steroid injection (ESI) and discuss the different pathophysiological mechanisms involved. The authors strongly recommend that 0.5% bupivacaine should be used with caution for caudal epidural injection.**

**Keywords:** caudal epidural injection ; bupivacaine ; corticosteroids ; paraplegia.

---

### INTRODUCTION

The authors would like to report a case of paraplegia following a caudal epidural steroid injection (ESI). This case report discusses not only various complications of ESI in general, but also the specific pathophysiological mechanisms implicated in the development of paraplegia after epidural injection in particular.

### CASE REPORT

A 56-year-old otherwise fit and well female presented to Accident and Emergency department with severe right sided leg symptoms. The clinical examination and subsequent MR scan confirmed a right sided L5/S1 disc prolapse with S1 nerve root compression but no distal neurological deficit. A caudal epidural injection was advised.

The procedure involved image guided placement of an 18 gauge epidural needle through the sacral

hiatus under local anaesthesia, with the patient in prone position. An epidural catheter was fed through the needle and was advanced upto the L5/S1 disc space. An epidurogram was obtained to confirm the location of the catheter in relation to the epidural space. A total of 20 ml of the drug containing a mixture of Triamcinalone and Bupivacaine (0.5%) was injected after confirming a dry tap. In the recovery room, we noticed that she developed profound hypotension and bilateral grade zero power in the lower limbs within 20 minutes from the time of epidural injection. The level of the temporary neurological deficit reached up to the T12 dermatome.

Fluid resuscitation was immediately commenced. The consultant anaesthetist suggested that the weakness could be due to a possible spinal anaesthesia. An urgent MR scan was arranged to rule out formation of a spinal haematoma or another space occupying lesion. Her lower limb neurology was closely

---

■ Brinda Vihari Somanchi, MD, Spinal fellow.

■ Saeed Mohammad, MD, Consultant Spinal Surgeon.

■ Raymond Ross, MD, Consultant Spinal Surgeon.

*Spinal Unit, Salford Royal Hospital, Salford, United Kingdom.*

Correspondence : Brinda Vihari Somanchi, Flat 3, Squires court, Salford M5 5AD, United Kingdom.

E-mail : [brindavihari2001@yahoo.com](mailto:brindavihari2001@yahoo.com)

© 2008, Acta Orthopædica Belgica.

---

monitored. MR scan did not show any evidence of a haematoma.

Subsequently, the patient regained full sensory function in both lower limbs in 16 hours and full motor function in 20 hours following the procedure.

## DISCUSSION

Epidural steroid injection is recommended in patients with radicular pain or pain suggestive of radiculopathy (16). The value of caudal epidural steroid injections (ESI) in treatment of low back pain and sciatica is controversial (3). The rationale for administration of ESIs is based on the assumption that inflammation of the spinal nerve root causes radicular pain and the epidural corticosteroids relieve this pain, allowing time for healing and physical therapy. It is believed that ESIs are mainly effective in treating acute radiculopathy at intermediate term follow-up, even though it was found to have no long-term benefit (17). Absolute contraindications to ESI include systemic infection, local infection at the site of the planned injection, bleeding disorder or anticoagulant therapy, allergy to glucocorticoids, and patient refusal (5).

Although epidural steroid injection is a common tool of "conservative" therapy in patients with radicular pain (16), it is not inherently benign (13). Several rare complications have been reported in the literature. They include local discomfort, infection, steroidal side effects, dural puncture, postdural puncture headache (PDPH), epidural haematoma, and nerve injury (1). Other rare complications include increased back pain, facial flushing, vasovagal reactions, episodes of nausea, increased leg pain (6) and even transient blindness (18). Most complications are more related to the invasiveness of the procedure than to the injection itself (14).

The most common technical complication of ESI is inadvertent dural puncture, which has an incidence as high as 7% (2). PDPH occurs in 20% to 50% of all dural punctures (12). Paraplegia following administration of epidural injection has been reported in the literature but varied pathophysiological mechanisms were suggested. Tripathi *et al* (16) reported a case in which an accidental "intracord injection" of steroid solution during epidural block

using fluoroscopy in a conscious patient, caused paraplegia. The patient reported paraesthesia in the legs during injection (16). McLain *et al* (13) reported a unique case of transient, profound paralysis after ESI "without fluoroscopy control", which resolved over a 2-3 hours period. In their opinion the period of recovery was consistent with an acute but brief compressive injury and inconsistent with an anaesthetic effect. They proposed three possible mechanisms (a) inadvertent thecal penetration during injection may have produced an atypical anaesthetic block; (b) loculation of the injected fluid may have caused a transient compressive lesion; or (c) intrathecal injection may have produced an iatrogenic arachnoid cyst. In our patient recovery took over 15 hours which does not fit into any of the mentioned mechanisms.

Stoll *et al* (15) reported a case of myelopathy developed in an otherwise fit and healthy male eight days after ESI due to development of epidural haematoma formation. They mentioned that epidural haematoma formation is a common complication after ESI in patients with coagulation disorders, though their case represents an exception to that. Cases of paraplegia have been reported after transforaminal steroid injection in which either an anatomical variation of artery of Adamkiewicz (10) or vascular injury leading to an infarction of the spinal cord (9,11) were implicated in the pathophysiology. Development of an epidural abscess has been implicated as one of the causes for neurological deficit after ESI (7).

Craig *et al* (8) reported a case of severe flaccid paraplegia after administration of epidural injection for labour and delivery, which took 16 months to recover. They attributed this to the 1.5% benzyl alcohol preservative contained in a 0.9% saline solution used for post delivery epidural injection. But the solution that was used in our case did not contain such chemicals. Bilir *et al* (4) reported a case of cauda equina syndrome after epidural injection of triamcinolone and bupivacaine, which developed 3 hours after injection and resolved completely after eight hours. They proposed that it is most probably due to the anaesthetic effect of the injection and suggested that continued vigilance for neurologic deterioration after epidural steroid

injections is important. In our patient, the same mixture was used but the strength of bupivacaine used was 0.5%. We assume that the 0.5% strength could have been the underlying reason for the patients to develop paraplegia not only within shorter time after the procedure but also for a prolonged duration of the anaesthetic effect.

### CONCLUSION

The surgeon and the patient should be made aware that transient paraplegia is a possible complication after caudal epidural injection. We strongly recommend that 0.5% bupivacaine should be used with caution for caudal epidural injection.

### REFERENCES

- Abram SE.** Treatment of lumbosacral radiculopathy with epidural steroids. *Anesthesiology* 1999 ; 91 : 1937-1941.
- Abram SE, O'Connor TC.** Complications associated with epidural steroid injections. *Reg Anesth* 1996 ; 21 : 149-162.
- Banaszkiewicz PA, Kader D, Wardlaw D.** The role of caudal epidural injections in the management of low back pain. *Bull Hosp Jt Dis* 2003 ; 61 : 127-131.
- Bilir A, Gulec S.** Cauda equina syndrome after epidural steroid injection : a case report. *J Manipulative Physiol Ther* 2006 ; 29 : 492. e1-3.
- Bosscher HA, Glitin MG.** Epidural steroid injections. In : Raj PP, ed. *Textbook of Regional Anesthesia*. Churchill Livingstone, New York, NY, 2002 : pp 687-702.
- Botwin KP, Gruber RD, Bouchlas CG et al.** Complications of fluoroscopically guided caudal epidural injections. *Am J Phys Med Rehabil* 2001 ; 80 : 416-414.
- Cooper AB, Sharpe MD.** Bacterial meningitis and cauda equina syndrome after epidural steroid injections. *Can J Anaesth* 1996 ; 43 : 471-474.
- Craig DB, Habib GG.** Flaccid paraparesis following obstetrical epidural anesthesia : possible role of benzyl alcohol. *Anaesth Analg* 1977 ; 56 : 219-221.
- Glaser SE, Falco F.** Paraplegia following a thoracolumbar transforaminal epidural steroid injection. *Pain Physician* 2005 ; 8 : 309-314.
- Houten JK, Errico TJ.** Paraplegia after lumbosacral nerve root block : report of three cases. *Spine J* 2002 ; 2 : 70-75.
- Huntoon MA, Martin DP.** Paralysis after transforaminal epidural injection and previous spinal surgery. *Reg Anesth Pain Med* 2004 ; 29 : 494-495.
- Jankowski CJ.** Complications of regional anesthesia. In : Raj PP. *Textbook of Regional Anesthesia*. New York, NY : Churchill Livingstone ; 2002 : pp 829-852.
- McLain RF, Fry M, Hecht ST.** Transient paralysis associated with epidural steroid injection. *J Spinal Disord* 1997 ; 10 : 441-444.
- Snarr J.** Risk, benefits and complications of epidural steroid injections : a case report. *AANA J* 2007 ; 75 : 183-188.
- Stoll A, Sanchez M.** Epidural hematoma after epidural block : implications for its use in pain management. *Surg Neurol* 2002 ; 57 : 235-240.
- Tripathi M, Nath SS, Gupta RK.** Paraplegia after intracord injection during attempted epidural steroid injection in an awake patient. *Anesth Analg* 2005 ; 101 : 1209-1211.
- Wilson-MacDonald J, Burt G, Griffin D, Glynn C.** Epidural steroid injection for nerve root compression. A randomised, controlled trial. *J Bone Joint Surg* 2005 ; 87-B : 352-355.
- Young WF.** Transient blindness after lumbar epidural steroid injection : a case report and literature review. *Spine* 2002 ; 27 : E476-E477.