

Case Report

Lumbar spinal epidural hematoma after chiropractic manipulation: A case report

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ABSTRACT

Lumbar epidural hematoma is a very rare condition and can cause permanent neurological deficit needing urgent investigation and prompt intervention. We present here a case of lumbar epidural hematoma after chiropractic manipulation therapy for low back pain without any obvious predisposing factor. A fairly healthy and lively 72-year-old woman was admitted to our hospital because of grade 4 paresis after chiropractic manipulation therapy. She had no history of anticoagulation therapy. Magnetic resonance imaging (MRI) showed a spinal epidural hematoma with dural sac compression at the level of L3–L4. Rapid decompression of the spinal channel was performed. On follow-up 4 weeks after surgery, the patient was fully ambulatory and complained only of slight pain at the surgical site. MRI is the most useful method for diagnosing spinal epidural hematoma, the appropriate treatment for patients with neurological deficits being surgical decompression. Practitioners of chiropractic manipulation therapy should be aware of spinal epidural hematoma as a possible complication and should exercise caution in subgroups of patients on antithrombotic medication. Spinal epidural hematoma is a potentially reversible cause of neurological deterioration if diagnosed early and treated promptly.

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1. Introduction

Chiropractic manipulation is widely used for the treatment of neck pain and low back pain. Serious complications after spinal manipulation therapy are rare, and are most often seen in the cervical region.¹ Spinal epidural hematoma is one of these rare conditions and can cause permanent neurological deficit, so it is a emergent condition needing urgent investigation and prompt intervention. Common causes of spinal epidural hematoma include spinal injury and invasive spinal procedures such as lumbar puncture, epidural anesthesia, or myelography; it can also be spontaneous. More than one-third of reported cases have been associated with anticoagulation therapy.² We present a case of lumbar epidural hematoma after chiropractic manipulation therapy for low back pain without the risk factor of anticoagulation therapy.

2. Case report

A fairly healthy and lively 72 year-old woman was admitted to our hospital because of progressing weakness and numbness of the left leg after chiropractic manipulation therapy. Before admission,

she had had a 2-month history of low back pain. The patient had sought lumbar manipulation therapy from her chiropractor to relieve her symptoms, and had had two appointments in 3 days (about 1 week prior to her admission).

However, during the second session of manipulation therapy, about 6 days prior to her admission, she had felt an immediate worsening of her symptoms along with radiation of the pain to her left leg. She also experienced numbness in the left leg region. Furthermore, she had reduced sensation of her bladder and felt that she was unable to empty her bladder completely. Her symptoms worsened over 3 or 4 days, with a progressive weakness in her both lower extremities.

On admission, the neurological examination showed grade 4 paresis of the lower extremities, along with decreased deep tendon reflexes for both legs. Paresthesia of the L4–L5 dermatome was also noted. The patient had no history of anticoagulation therapy, and her International Normalized Ratio was 0.95. A magnetic resonance imaging (MRI) scan of her lumbar spine region was promptly ordered, which showed a spinal epidural hematoma with dural sac compression at the level of L3–L4 (Fig. 1). Intravenous pulse prednisolone therapy was initiated.

The patient was immediately referred for surgery, and a decompressive partial laminectomy from L3 to L4 was performed, with evacuation of the epidural blood clot. Intraoperatively, posterolateral clotted blood under an ecchymotic ligamentum flavum was found within the epidural space, but no obvious vascular

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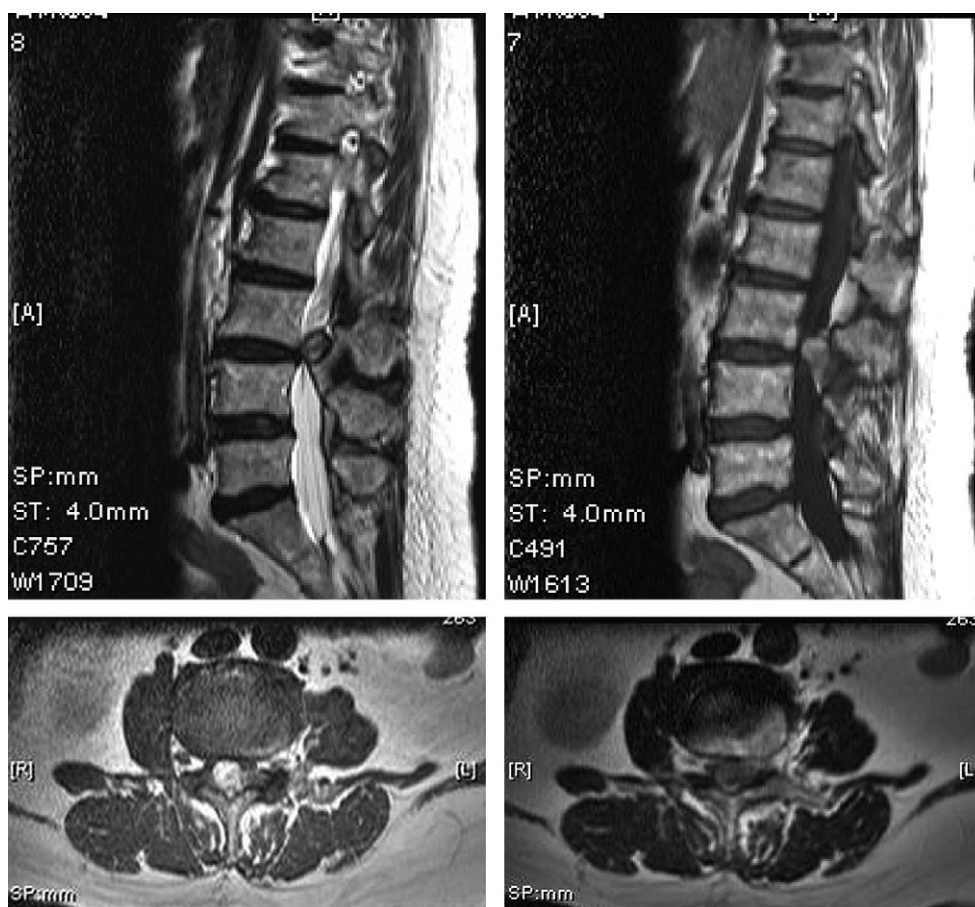


Fig. 1. Magnetic resonance imaging showed a spinal epidural hematoma with spinal cord compression at the level of L3–L4.

malformation was visible (Fig. 2). The histological examination showed blood organizing into a clot.

Postoperatively, the patient gradually regained her strength. At follow-up 4 weeks after surgery, she was fully ambulatory and complained only of slight pain at the surgical site.

3. Discussion

Chiropractic spinal manipulation therapy is widely used in industrialized countries, spinal epidural hematoma being a rare complication of chiropractic manipulation.³ On reviewing the literature, although the true incidence of chiropractic manipulation for spinal disorder remains uncertain, the annual incidence of spinal epidural hematoma has been estimated at 0.1 per 100,000.^{3–5}

Spinal epidural hematomas are usually thought to be caused by trauma, but the exact mechanism by which spinal manipulation therapy might precipitate spinal epidural hematoma is unknown. Recent reports suggested that most cases are spontaneous, although some predisposing factors, including inherited or acquired coagulopathy and spinal vascular malformation, have been identified.

The characteristic symptoms of spinal epidural hematoma usually start with acute neck or back pain, sometimes with radicular paresthesia. The signs and symptoms of neural compression appear within hours, and the paraplegia and loss of sensory function progress. As spinal epidural hematomas develop rapidly and often have serious consequences, early diagnosis and treatment are of the utmost importance.⁶ MRI is the most useful method for diagnosing

spinal epidural hematoma; it can evaluate the location and extent of the hematoma, cord compression, and spinal cord edema.^{6–9}

Although some reports show a spontaneous recovery of spinal epidural hematoma without surgery, the appropriate treatment remains surgical decompression for patients with severe or worsening neurological deficits.^{9–11} The prognosis of neurological

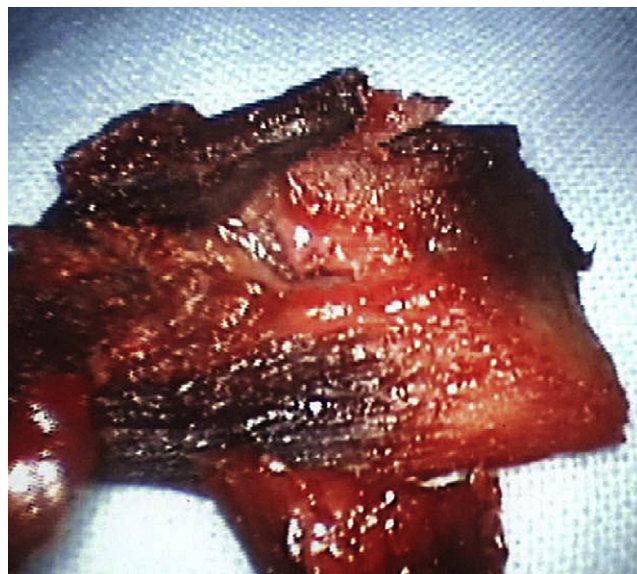


Fig. 2. Ecchymosis of the ligamentum flavum.

deficits mainly relates to preoperative neurological status, early diagnosis and surgical intervention.^{12,13}

In our case, the patient was not receiving anticoagulant therapy, and had no history of trauma or other predisposing factors. Although neither facet joint destruction nor other ligamentary disruption was noted during surgery, we thought that the spinal epidural hematoma might have been caused by rupture of thin-walled veins in the epidural venous plexus as a result of hypermotion or sudden changes in venous pressure during the chiropractic manipulation. Therefore, a potential causal relationship between spinal epidural hematoma and chiropractic manipulation seems reasonable in our case.

The patient was fully ambulatory on follow-up 4 weeks after surgery. We felt that rapid decompression of the spinal cord and incomplete paraplegia preoperatively were the major factors contributing to a satisfactory result for our patient.

An unusual aspect in this case is that the spinal epidural hematoma occurred in the lumbar region. Reviewing the previous reports, only one case of lumbar epidural hematoma related to chiropractic manipulation therapy has been discussed.¹ To our knowledge, our case may be the first documented case of lumbar epidural hematoma without predisposing factors reported as a complication of chiropractic manipulation of the spine.

Practitioners of chiropractic manipulation therapy should be aware of spinal epidural hematoma as a possible complication and should exercise caution in subgroups of patients on antithrombotic medication, as their risk may be higher. Spinal epidural hematoma is a potentially reversible cause of neurological deterioration if diagnosed early and treated promptly.

References

1. O. Solheim, J.V. Jorgensen, O.P. Nygaard. Lumbar epidural hematoma after chiropractic manipulation for lower-back pain: case report. *Neurosurgery* 61 (1) (2007) E170–E171.
2. S. Harik, M. Raichle, R.D. Feis. Spontaneous remitting spinal epidural hematoma in a patient on anticoagulants. *N Engl J Med* 284 (1971) 1355–1357.
3. J.M. Whedon, P.B. Quebada, D.W. Roberts, T.A. Radwan. Spinal epidural hematoma after spinal manipulative therapy in a patient undergoing anticoagulant therapy: a case report. *J Manipulative Physiol Ther* 29 (7) (2006) 582–585.
4. S. Holtas, M. Heiling, M. Lonntoft. Spontaneous spinal epidural hematoma: finding at MR imaging and clinical correlation. *Radiology* 199 (1996) 409–413.
5. E. Ernst. Prospective investigations into the safety of spinal manipulation. *J Pain Symptom Manage* 21 (2001) 238–242.
6. H.P. Yu, S.W. Fan, H.L. Yang, T.S. Tang, F. Zhou, X. Zhao. Early diagnosis and treatment of acute or subacute spinal epidural hematoma. *Chin Med J (Engl)* 120 (15) (2007) 1303–1308.
7. C.R. Gundry, K.B. Heithoff. Epidural hematoma of the lumbar spine: 18 surgically confirmed cases. *Radiology* 187 (1993) 427–431.
8. M. Boukobza, J.P. Guichard, M. Boissonet, B. George, D. Reizine, F. Gelbert, J.J. Merland. Spinal epidural hematoma: report of 11 cases and review of the literature. *Neuroradiology* 36 (1994) 456–459.
9. A. Matsumura, T. Namikawa, R. Hashimoto, T. Okamoto, I. Yanagida, M. Hoshi, K. Noguchi, et al. Clinical management for spontaneous spinal epidural hematoma: diagnosis and treatment. *Spine J* 8 (3) (2008) 534–537.
10. C.C. Liao, S.T. Lee, W.C. Hsu, L.R. Chen, T.N. Lui, S.C. Lee. Experience in the surgical management of spontaneous spinal epidural hematoma. *Neurosurgery* 100 (2004) 38–45.
11. W. Borm, K. Mohr, U. Hassepass, H.P. Richter, E. Kast. Spinal hematoma unrelated to previous surgery: analysis of 15 consecutive cases treated in a single institution within a 10-year period. *Spine* 29 (2004) E555–E561.
12. S.M. Hussenbocus, M.J. Wilby, C. Cain, D. Hall. Spontaneous spinal epidural hematoma: a case report and literature review. *J Emerg Med* (2009 Jan 5) Epub.
13. J.J. Shin, S.U. Kuh, Y.E. Cho. Surgical management of spontaneous spinal epidural hematoma. *Eur Spine J* 15 (6) (2006) 998–1004.