

# **Iatrogenic Lumbar Spinal And Cord Myelomalacia Syringomyelia As- Aq Complicacy Of Spinal Anaesthesia**

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## **Abstract**

Due to its rarity, iatrogenic spinal cord damage during spinal anaesthesia subsequent to lumbar puncture is a somewhat less well-known phenomenon. Syrinx development or myelomalacia of the lumbar spinal cord due to direct cord damage is extremely rare. We present five patients who had this consequence, which resulted in a variety of neurological impairments, and whose MRI revealed myelomalacia or syrinx in the conusepiconus region. During follow-up, some of our patients showed symptomatic partial to complete recovery. As a result, practitioners must be aware of the risk of lumbar puncture during spinal anaesthetic and proceed with caution to avoid neurological problems.

## **Introduction**

Because of the minimal risk of complications, spinal anaesthesia is the most extensively used and relatively safe regional anaesthetic for caesarian sections and other lower abdominal operations. Serious complications such as post-lumbar puncture headache and arachnoiditis are uncommon, but direct spinal cord injury leading in myelomalacia and syrinx development with either transitory or chronic problems is even more uncommon. We present the case of five individuals who had direct spinal cord injury during attempted lumbar spinal anaesthesia, resulting in a variety of sensory and autonomic impairments.

## **Materials and methods**

In the last ten years, our Neurology outpatient clinic has encountered five comparable cases. All of these patients had varied degrees of paralysis and sensory abnormalities, as well as bladder and bowel issues. The onset of symptoms occurred at the same time as the use of a spinal needle for lumbar anaesthesia. Soon after the lumbar puncture, all of these patients had intense shooting pain in their backs that spread downward. When these individuals came in with chronic complaints, they were submitted to a dorso-lumbar spine MRI examination. These patients were also followed up on to see how their disease progressed and how they responded to various neuropathic pain medications.

## **Cases**

### **Case 1:**

After 4 months of caesarian section, a 32-year-old woman appeared. From the day of surgery, there was burning pain in the left lower limb distribution in the L3-S1 dermatome, as well as a foot drop on the left side. Following the removal of Foley's catheter on the second post-operative day, she suffered urinary retention, which was treated with re-catheterization. She gradually regained bladder control, but when she was discharged from the hospital on the tenth day after surgery, she had urine urgency and intermittency in addition to the motor-sensory problems listed above. On the affected side, the ankle reflex was gone, while the knee reflex was present. At L1 level, imaging of the lumbar spine revealed asymmetrical left sided cystic myelomalacia (syrinx). Pregabalin and a foot drop splint were used to control her neuropathic pain. Symptomatic treatment for urinary complaints was also used. She was told to keep an eye on her and follow up.

### **Case 2:**

A 43-year-old woman underwent hysterectomy under spinal anaesthesia two months ago due to irregular uterine haemorrhage. She reported discomfort and tingling paresthesia in her left lower limb along the S1-S2 distribution right after spinal anaesthesia. She noticed a loss of sensation in the S1 dermatome on the same side. There is no evidence of a motor deficiency or bladder involvement. All of the reflexes were retained. Her discomfort was not responding to medication, so she was referred here. T2 hyperintensity at the L1 level was seen on an MRI of the lumbar spine, indicating myelomalacic alterations. Her neuropathic pain was treated with a variety of medications (gabapentin and amitriptyline). She was supposed to be observed and followed up on.

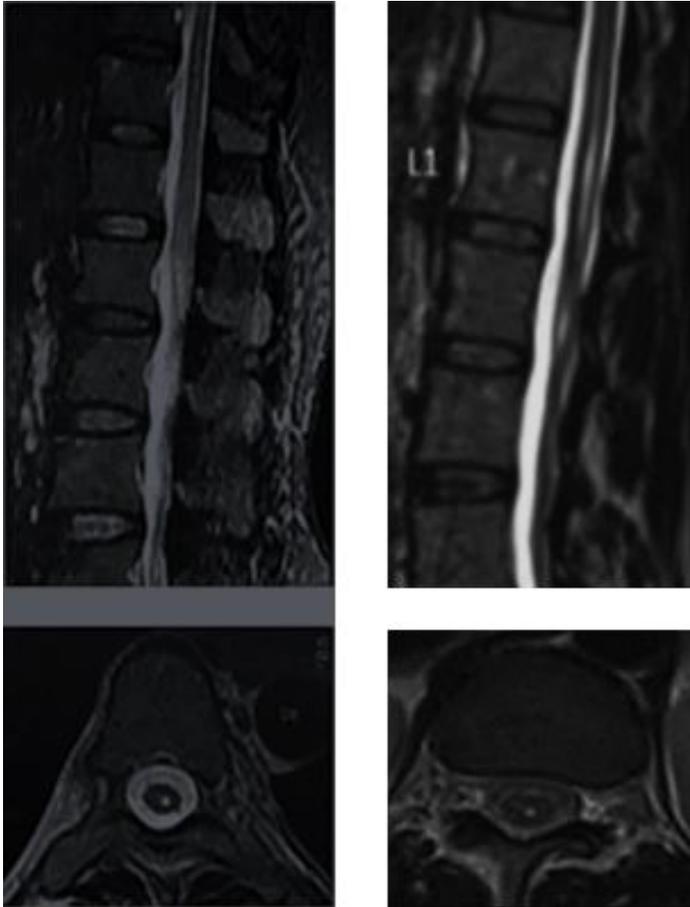


Figure: The lumbar MR scans of the first and second patients were shown on the right side and left side of the picture, respectively. As a result of injury to the spinal cord produced by lumbar puncture needle and administration of local anaesthetic agent, sagittal and axial T2 weighted MRI revealed cystic myelomalacia or syrinx inside the material of the conus–epiconus area of the spinal cord.

### Case 3:

A 32-year-old primipara woman was scheduled for a caesarian section because to a transverse lying. She felt intense shooting pains in both lower limbs extending from the back when the needle was inserted. When the anaesthetic took effect, the pain went away for a while but reappeared later. She was told not to move her left lower limb for a few days and reported pain radiating from the L4-L5 dermatomes, as well as diminished feeling. Foot drop on the same side was 4/5, as was power at both the left knee and ankle. At the left knee, reflexes were missing, while at the left ankle, they were decreased. An MRI of the lumbocascral spine revealed asymmetrical left-sided localised cystic myelomalacia/syrinx development at the level of the L1 spine. In the following 6-12 months, her weakness and hypoaesthesia improved, but she still had dull aching pain, which

was eased to some extent by a combination of carbamazepine and gabapentin. After nearly three years, her pain symptoms were completely gone.

#### **Case 4:**

This patient, a 35-year-old woman, had a caesarian section while under spinal anaesthesia. There were no perioperative issues because the block was enough. She couldn't move her left lower limb on the first postoperative day. She experienced hyperalgesia in the L5, S1, and S2 dermatomes on the left side. On the afflicted side, power in the knee flexors and plantar flexors was 3/5. Both the left knee and ankle have reduced reflexes. T2 weighted MRI imaging of the lumbosacral spine revealed asymmetric and left-sided cystic myelomalacic alterations in the D12-L1 region, but no epidural or disc protrusion. She made significant progress over the next six months, with her weakness and hyperalgesia disappearing.

#### **Case 5:**

A 45-year-old woman had a hysterectomy due to severe uterine haemorrhage. She experienced considerable agony extending from her back downwards during spinal anaesthesia, which worsened with the injection of an aesthetic medication. She felt radiating pain from the L3 dermatome downwards, as well as bilateral hyperalgesia. On evaluation, there was a right-side impairment in position sense but no motor deficiency. There were no abnormal reflexes or bladder/bowel involvement. In axial T2 weighted images, MRI of the lumbosacral spine revealed T2 hyper intensity in the D12-L1 area s/o focal myelomalacic alterations, which was restricted to the right side. She improved over the next six months as her pain meds were gradually reduced.

#### **Discussion**

During spinal anaesthesia, the incidence of temporary neurological signs and symptoms such as paraparesis, mono paresis, discomfort, and hyperalgesia ranges from 0.01 percent to 6.8 percent (2-4). Direct intraneural injection is commonly blamed for these effects. Persistent neurological impairments are uncommon (0.01–0.8%), and the reason is unknown (1). We describe five individuals who had direct spinal cord injuries as a result of attempted lumbar spinal anaesthesia, resulting in a variety of sensory impairments. We had already reported the first three cases (Pradhan S, et al.). (5) Another instance of this nature has been reported from our institute. That case was a 46-year-old woman who was operated on for intestinal obstruction under spinal anaesthesia and developed Charcot knee two weeks later as a result of lumbar spinal cord syringomyelia, a spinal anaesthesia complication. (6) LP is usually performed below Tuffier's line, an imaginary line that runs across the L4 spinous process and connects the superior parts of the posterior iliac crests. Accidental spinal needle insertion into higher intervertebral spaces can injure the spinal cord, especially if the cord is low lying. These kinds of injuries are more likely to occur in elderly individuals, especially women (7). Females have a greater BMI, and palpating the tuffier's line through varying degrees of subcutaneous fat in obese females is challenging. The

specific cause of these injuries during lumbar puncture is unknown. Direct injury to the spinal cord can occur as a result of a needle puncture or the noxious effect of an anaesthetic substance injected directly into the cord. The anaesthetic agent's pressure effect, combined with its chemical reaction, might cause vascular impairment in the corresponding portion of the cord, compounding the injury. Other causes of myelomalacia/syrinx production include arachnoiditis, viral spondylodiscitis, and the development of an arachnoid cyst. (5) In our cases, these causes were ruled out because the symptoms appeared shortly after the lumbar puncture. In the early stages, an MRI of the conus area revealed no signs of arachnoiditis. Furthermore, direct damage rather than generalised arachnoiditis can explain focal unilateral syrinx development restricted to the conus area. As a result, we believe that these syringes were created only as a result of direct needle injury to the cord. When epidural or spinal blockage causes immediate neurological symptoms, an MRI of the dorso-lumbar spine should be performed to rule out epidural hematoma, prolapsed disc, and subdural hematoma, as well as the possibility of urgent surgical intervention. Although an MRI was not performed during the acute phase in these cases, subsequent imaging did not reveal any abnormalities, and the course of sickness was rather static or improving, as opposed to the expected deterioration in neurosurgical situations. All of our examples, as well as a few previously published cases, share a few common characteristics. Anteroposterior involvement of conus with preservation of cord volume despite myelomalacia, and sudden back pain with radiation to bilateral lower limbs on insertion of the spinal needle with increase in pain during the injection of anaesthetic agent, peak unilateral motor sensory deficits as soon as the anaesthetic effect got over, and anteroposterior involvement of conus with preservation of cord volume despite myelomalacia, favour direct injury to the spinal cord either by needle or As a result, these clinical and radiological characteristics aid in the diagnosis of myelomalacia caused by direct cord damage. (1) On follow-up, the majority of our cases recovered to a large extent within a variable time period. In contrast to some prior reports of lasting disabilities following spinal cord injury caused by lumbar puncture, this is a positive finding. The only pharmacological therapy helpful in acute spinal cord therapy is high dosage methylprednisolone therapy within eight hours, according to a Cochrane analysis published in 2012. The benefits of this type of therapy have also been demonstrated to last for up to 48 hours. However, none of our patients received a steroid study. All of the patients were treated with caution, relying on medicines and rehabilitation. Our study had a fundamental flaw in that we didn't do follow-up imaging to determine the exact state of the syrinx. Another disadvantage in all of these cases was that we didn't know the specific location or intensity of spinal anaesthesia. This could be due to a lack of sufficient documentation (anaesthesia note during procedure) and the fact that all of these individuals had surgery at a district level hospital.

## **Conclusion**

This case series of five patients clearly demonstrates post-lumbar puncture produced conus-epiconus/myelomalacia or syrinx development as a result of direct cord injury, resulting in a variety of neurological deficits. As a result, clinicians should be aware of this potentially fatal complication of lumbar puncture, and suspected patients should be exposed to dorso-lumbar spine

imaging tests and methylprednisolone trials. Future high-resolution MRI studies, particularly spinal cord tractography, conducted soon after the ictus and during follow-up would disclose more information about its origin.

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