

# Foot drop after spinal anesthesia for cesarean section: a case report

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**Objective:** Spinal anesthesia is the preferred anesthetic technique for cesarean section. Neurological complications are very rare and often transient after spinal anesthesia.

**Case report:** In the present case, a 37-year-old woman was considered eligible for cesarean section due to fetal distress. She underwent spinal anesthesia with a 25-gauge pencil-point spinal needle. In the sitting position, 3 mL of 0.5% bupivacaine was injected following free flow of cerebrospinal fluid. The cesarean delivery was uneventful without severe and significant hemodynamic changes. After recovery, the patient complained of tingling and stiffness in the left leg, accompanied with movement disorders and foot drop. Lumbar magnetic resonance imaging was normal. After receiving 500 mg intravenous methylprednisolone daily for 72 hours, she was discharged from the hospital with no particular problems.

**Conclusion:** Foot drop is a neurological disorder, which occurs following natural childbirth and spinal anesthesia due to direct needle trauma or local anesthetic toxicity. This complication is transient and usually resolves within a few days. In our patient, the neurological complication appeared after labor and anesthesia recovery, which was treated by corticosteroids and anti-inflammatory drugs, with no particular side effects.

**Keywords:** foot drop, cesarean section, spinal anesthesia

## Introduction

Neurological complications following regional anesthesia are uncommon. The prevalence of these complications is estimated to be 0–36 per 10,000 epidural anesthesia cases and about 35 per 10,000 spinal anesthesia cases.<sup>1,2</sup> These complications occur in 20% of postpartum women, with only 0.2% being clinically significant.<sup>3</sup> Generally, a few neurological complications are reported after cesarean section.<sup>4</sup> Subarachnoid block is a common and safe method for the delivery of the anesthetic. In a 2-year study by Scott and Tunstall, neurological disorders were reported in eight out of 14,856 deliveries with spinal anesthesia (0.054%), all of which were transient.<sup>5</sup> Moreover, in one study, neurological disorders were reported in 24 cases, with a prevalence of 0.06% after spinal anesthesia and 0.02% after epidural anesthesia.<sup>6</sup>

Foot drop arises from lumbosacral trunk injury and damage to the common fibular nerve. The symptoms of this neurological disorder, which often occurs in mothers of short stature with fetal macrosomia, include unilateral movement disorders of the ankles with sensory impairment or paresthesia; however, this type of complication is rare after cesarean section.<sup>7</sup> Herein, we present a case of foot drop following spinal anesthesia for cesarean delivery. We obtained written informed consent from the patient

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for publication of her case details and as per the specifications of the journal.

## Case presentation

A 37-year-old woman (G1P0AB0L0) with 181 cm height and 88 kg weight presented to our clinic for cesarean section due to fetal distress. She had no history of cardiopulmonary, nervous, or sensory motor problems before the cesarean section. The preanesthetic examination indicated the following results: a body temperature of 36.5°C, 17 breaths/min, 78 beats/min, and a blood pressure of 120/80 mmHg. Moreover, preoperative routine coagulation results were normal (international normalized ratio=1).

On fetal ultrasonography, cephalic presentation and a normal anterior placenta (grade II) were reported (amniotic fluid index, 105 mm; estimated fetal weight, 3,150 g). The spinal anesthesia was performed after obtaining the mother's consent. She was initially monitored in terms of electrocardiography, peripheral capillary oxygen saturation, and noninvasive blood pressure. Then, 500 mL of 0.9% normal saline was administered. Spinal anesthesia was induced in the sitting position, using a 25-gauge pencil-point spinal needle. The needle was inserted into the L3–L4 space and, after withdrawal of the cerebrospinal fluid, 3 mL of 0.5% bupivacaine was injected. Following needle removal, her position was immediately changed to the supine position.

Spinal anesthesia was induced without any incidents, pain, or paresthesia at the time of needle insertion or local anesthetic injection. After 5 minutes and attaining an upper sensory level of T4, the cesarean section was performed without any significant blood pressure changes on ~40 minutes. During operation, we infused 1,500 mL of 0.9% saline again with 700 mL hemorrhage. The patient had no significant hypotension, and we did not inject vasopressor. After 90 minutes, the nerve block was on T10 level, and on 2.5 hours, the patient had no foot anesthesia and could move and flex her knees.

Following the cesarean section and recovery from spinal anesthesia, the patient reported tingling and paresthesia of the left lower limb. Upon examination, the right dorsiflexion was normal, whereas the left dorsiflexion was reduced to the II/V level. The right plantar flexion was normal, whereas the left plantar flexion was reduced to II/V. The patient complained of foot drop, and her left ankle was immobile with reduced leg muscle strength (II/V). Other than the left foot drop, there were no other sensory and motor symptoms in upper left leg. Sensory and motor examinations were normal in the right

leg. Lumbar magnetic resonance imaging (MRI) results were reported to be normal. The electromyography (EMG) showed reduced conduction velocity, besides increased latency and frequency in the lumbar region.

A 500 mg intravenous methylprednisolone was prescribed daily for 3 days and was gradually reduced over the next days. The patient's foot drop was resolved in about 72 hours. She had no other problems and was discharged 3 days after cesarean section. After 1 week, she referred no related signs to the clinic, and the neurological examination was normal.

## Discussion

Spinal anesthesia is commonly used for cesarean delivery. The most common side effects of this method include hemodynamic changes, nausea and vomiting, back pain, and headache. Neurological complications following spinal anesthesia are rare and transient, with a prevalence of about 3.5%.<sup>1</sup> So far, rare cases of permanent neurological complications have been reported. The most common causes of these complications include direct needle trauma and local anesthetic-induced neurotoxicity.

In one study, 24 out of 71,053 patients with neuraxial blocks had neurological complications.<sup>6</sup> Paresthesia due to needle placement or injection and repeated attempts were major contributors of lumbosacral nerve injury.<sup>8,9</sup> Moreover, in another study, two-thirds of patients with neurological complications experienced pain during needle placement or local anesthetic injections. Needle size, anesthetic dose, and local anesthetic type have been shown to be effective in the development of neurological complications. Moreover, there are variations in the natural anatomical status of the spinal conus. Therefore, when it is located lower in the spinal cord, neurological complications are more common.

Foot drop is normally associated with common peroneal nerve damage, radiculopathy, relative sciatic nerve lesions, lumbosacral lesions, or cauda equina syndrome.<sup>10</sup> Other causes include epidural hematoma, epidural abscess, meningitis, and anterior spinal artery syndrome. In a long-term retrospective study, 17 out of more than 10,000 patients with spinal blockade had permanent neurological complications for up to 1 year.<sup>11</sup> Neurological paralysis in labor is three to four times more common after regional anesthesia. This postpartum injury occurs due to pressure between the fetal head and sacral trunk, which is the result of an inappropriate lithotomy position.

Neurological complications following spinal anesthesia are due to direct needle or catheter trauma, besides direct

intraneural injection of the local anesthetic. These complications may develop as radiculopathy of a single nerve root and are often transient.<sup>1,12</sup> In one study, the prevalence of neurological complications was nearly one in 1,000 cases.<sup>1</sup> Moreover, in a case report, neurological complication was seen in knee replacement surgery after combined spinal and epidural anesthesia. Pain and paresthesia were attributed to the needle insertion, not drug injection.<sup>13</sup>

Differential diagnosis of foot drop should be performed to detect complications of the central and peripheral nervous systems by conducting neural and EMG evaluations, as well as MRI studies, to investigate space-occupying lesions. Intense and long-term hemodynamic changes are among the factors, which cause spinal cord ischemia and spinal artery thrombosis, involved in neurological complications. In the present case, no specific hemodynamic changes were observed during surgery or spinal blockade. In some studies, a long-lasting lateral position was the cause of sciatic neuropathy.<sup>14,15</sup> But in our report, surgery lasted less than half an hour, and the patient was not in the lateral position for a long time.

The onset, recovery time rate, and extent of neurological symptoms vary among patients. In a study by Auroy et al on 103,000 patients with spinal blockade, all neurological problems initiated within 48 hours, and recovery took from 2 days to 3 months.<sup>6</sup> In our case, the complication appeared immediately after recovery from spinal anesthesia and the patient recovered after 72 hours.

In conclusion, we described the case of a patient who experienced unilateral foot drop after spinal anesthesia. This neurological complication appeared after cesarean section and was treated by corticosteroids and anti-inflammatory drugs, with no particular side effects.

## Disclosure

The authors report no conflicts of interest in this work.

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