



## Case Report

# Persistent cauda equina syndrome after cesarean section under combined spinal-epidural anesthesia: a case report<sup>☆</sup>

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**Abstract** A 29-year-old pregnant woman was delivered by cesarean section under a combined spinal-epidural anesthesia. Thirty hours after an uneventful surgery, she complained of weakness in her lower extremities and developed fecal and urinary incontinence. Lumbosacral magnetic resonance imaging showed thickening and clumping of cauda equina nerve roots at L2-3 level, consistent with the diagnosis of arachnoiditis. The patient was included in an intense rehabilitation program with a diagnosis of cauda equina syndrome. Most of the symptoms resolved within a few days, but right side foot drop persisted for 2 years after the procedure. Because there was no other etiologies being noticed, we hypothesized that the hyperbaric bupivacaine neurotoxicity was likely to be the cause for this neurologic deficit.

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## 1. Introduction

Serious neurologic complications after intrathecal anesthesia are rare but extremely distressing [1]. We here report a case of persistent cauda equina syndrome in the absence of any predisposing factors after uneventful combined spinal and epidural anesthesia with hyperbaric bupivacaine.

## 2. Case report 34

A 29-year-old, 160-cm, 61-kg, American Society of Anesthesiologists I, and gravida 1 para 0 parturient was admitted

to the hospital in her 38th week of pregnancy for her first cesarean delivery for breech presentation. No history of radicular pain or back pain was reported, nor was the presence of preexisting neurologic disorder. And the patient was not a diabetic. All the routine preoperative test results were within normal limits. With the patient in the right lateral decubitus position, the skin was cleaned twice using swabsticks impregnated with disinfectant of 0.2% iodine, 65% ethanol, and 0.45% chlorhexidine acetate combination. The swabsticks are contained in a disposable anesthesia package. The package (made by LvJian medical supplies Co, Ltd in Haining, Zhejiang Province, China) contains all the items needed, such as epidural needles, epidural catheter, syringe, gloves, gauze, etc. The skin was dried with sterile gauze. Epidural needle was placed at L2-3 on the first attempt by an experienced anesthesiologist wearing a sterile gloves, mask, and hat, using an aseptic technique. Then, a 25-G Whitacre pencil-point tip needle (Becton Dickinson and Company) was inserted, clear cerebrospinal fluid flow was observed, and 0.5% hyperbaric bupivacaine (contains 8% glucose) 2 mL was injected intrathecally in approximately 12

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seconds. The container of the bupivacaine was unsterile glass ampoule; before breaking open the ampoule, 70% alcohol was used to wipe the neck of the ampoule, but no needle filter was used. After injection of bupivacaine, an epidural catheter was then positioned 4 cm into the epidural space oriented in the cephalad direction. There was no paraesthesia or back pain or any other signs of nerve irritation during needle placement or drug injection into the subarachnoid space. After the anesthesia, the patient was positioned supine with left lateral tilt. The sensory block rose to T6, and C section was carried out for 30 minutes uneventfully with the patient in the supine position. No intraoperative analgesics or other drugs were required. Intraoperatively, her blood pressure was maintained within 20% of baseline. The surgical procedure was completed without incident, and the estimated blood loss was 300 mL. She was discharged to the ward after the operation. After an uneventful test dose, patient-controlled epidural analgesia was maintained with an infusion of mixed solution (0.1% ropivacaine and 1 µg/mL sufentanil) at a basal rate of 2 mL/h, the bolus of 2 mL, and the lock out time was 20 minutes.

The next day of the operation, the patient felt nothing abnormal in the day. But that night at approximately 30 hours postpartum, the patient got up to urinate and felt a sudden weakness on her right leg. And soon, the weakness increased. Furthermore, the left leg also felt weakness. The epidural catheter was removed immediately. Neurologic assessment confirmed bilateral sensory motor deficit of both the limbs with impaired sensation to pinprick in the perineal region. She developed fecal and urinary incontinence 6 hours later. A clinical diagnosis of cauda equina syndrome was made. Lumbosacral magnetic resonance imaging (MRI) performed immediately revealed thickening and clumping of cauda equina nerve roots at L2-3 level and L5-S1 intervertebral disc degeneration with slightly prominent, which is consistent with the diagnosis of arachnoiditis (Figure). There was no epidural abscess, hematoma, or spinal canal stenosis. The patient was managed conservatively on heavy doses of steroids [2]: methylprednisolone 500 mg intravenously guttae daily for 3 days, then reduced to 80 mg intravenously guttae daily for 10 days. The patient underwent a rehabilitation program of hyperbaric oxygen chamber, using traditional Chinese medicine and acupuncture. Four weeks later, the sensation of the 2 lower limbs recovered gradually. Electromyography showed neurogenic damage, involving bilateral lower extremities L5-S1 roots; L3-L4 was also involved in the right. Approximately 2 months postoperatively, the patient could void normally and had recovered bowel function. Seven months later, the patient still could not walk normally. A repeat MRI revealed similar with the first one. After 2 years of rehabilitation, a moderate right side steppage gait persisted, and foot drop still existed.

### 3. Discussion

An overview from randomized trials has shown that regional anesthesia reduces the risk of venous thromboem-



**Figure** Lumbosacral MRI showed thickening and clumping of cauda equina nerve roots at L2-3 level consistent with the diagnosis of arachnoiditis.

bolism, pulmonary embolism, myocardial infarction, bleeding complications, pneumonia, respiratory depression, and renal failure [3,4]. However, although very rare, there are also several complications related to regional anesthesia. One of the most important of these is neurologic complications. Fortunately, serious and permanent neurologic complications related to the use of neuraxial anesthesia in the obstetric population are rare events [5-8]. The exact incidence of permanent neurologic complications is difficult to determine but has been quoted to be between 0.3 and 1.2 per 100,000 [4]. Cauda Equina Syndrome is a well-known but rare complication of spinal-epidural anesthesia [9-14]. Cauda Equina Syndrome is characterized by varying degree of saddle anesthesia, sphincter dysfunction resulting in fecal incontinence, urinary retention, and paraplegia [15]. Damage to nerve roots of cauda equina after spinal anesthesia may occur due to compression, inflammation, stretching secondary to abnormal position, direct trauma, and spinal ischemia or as a result of neurotoxicity of local anesthetics [12,16,17].

In our patient, lumbosacral MRI revealed no spinal stenosis and no compression on the cauda equina nerve roots. And the patient had no paraesthesia or back pain during

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