CASE REPORT

Cauda equina syndrome after repeated spinal attempts: A case report and review of the literature

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ABSTRACT

Spinal and epidural blocks are widely used for cesarean section. Spinal hematoma causing cauda equina syndrome is a rare complication after spinal anesthesia (SA), but can lead to severe neurological deficit. It is usually associated with difficult SA and requires surgical decompression in most of the cases.

Key words: *Cesarean section, cauda equina syndrome, spinal anesthesia*

INTRODUCTION

Regional anesthesia for caesarean section is generally held to be inherently safe. Spinal and epidural blocks are used widely. Cauda equina syndrome (CES) rarely occurs, but is serious and potentially catastrophic disorder that can arise after neuraxial anesthesia. The frequency of CES after central regional blocks cannot be determined based on existing literature; only a few definitive case reports of CES exist, and fewer in parturient. We describe a rare case of CES after attempted difficult spinal anesthesia (SA) for caesarean section.

CASE REPORT

A 24 years primigravida was referred to our institution from peripheral health center for failed SA. Patient had a history of polio paralyzing right leg in the childhood. She was planned for caesarean section at 38 weeks due to cephalopelvis disproportion. In our institute, the vitals, general physical and systemic examination were unremarkable and obstetrical examination revealed term pregnancy with cephalic presentation and normal fetal heart rate. There were scars of multiple needle pricks in back at L3-L4 level. Routine investigations including coagulation profile were normal. Patient was operated upon under general anesthesia and an alive female baby weighing 2.8 kg was delivered. On the 5th postoperative day, she complained of numbness and tingling sensation in her normal left lower limb, her rest of the neurological examination was normal. She was informed about the need for spinal imaging if her complaints persists. Patient was discharged on request on 7th postoperative day as tingling subsided. On 10th postoperative day, patient reported in an emergency department with sudden onset of fecal and urinary incontinence. Immediate neurological consultation was taken, and magnetic resonance imaging (MRI) was ordered.

Magnetic resonance imaging revealed epidural hematoma at multiple levels extending from L3 to S1 [Figures 1-4]. Patient was operated upon, and hematoma was evacuated. Postoperative period was uneventful. On follow-up after 3 months, she had partial recovery. Patient was advised follow-up in neurosurgery but she never turned up after 3 months.

DISCUSSION

We reported a case in which patient developed CES due to spinal hematoma after difficult spinal. CES has been recognized as a rare, devastating complication of SA since Ferguson and Watkins[1] focused attention on this

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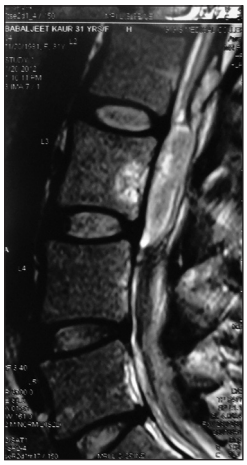

Figure 1: Collection in anterior epidural space at L3 level with edema in L3 vertebral body

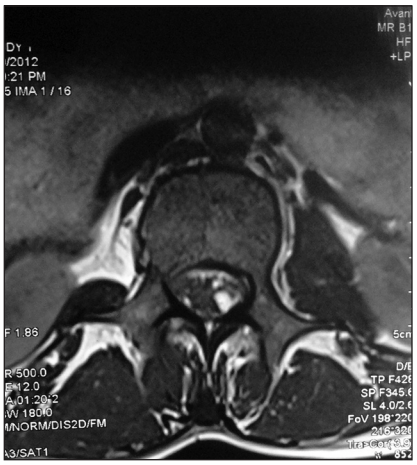

Figure 2: Collection in posterior epidural space at L5-S1 level

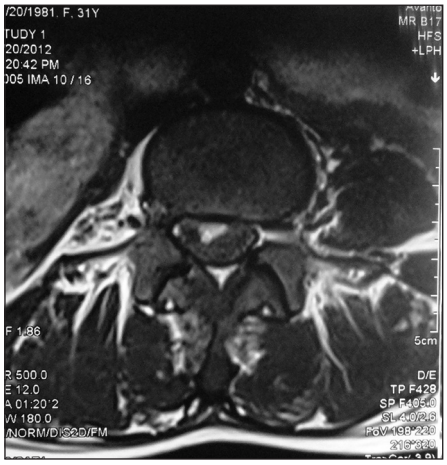

Figure 3: Collection in anterior epidural space at L3-L4 level

Figure 4: Multiple-echo data image combination sequence is showing blooming in the collection at L3 level suggestive of hemorrhage

syndrome in 1937. The CES refers to a characteristic pattern of neuromuscular and urogenital symptoms that results when diffuse injury occurs across the lumbosacral nerve roots, producing varying degrees of three specific symptoms: Saddle anesthesia, sphincter (bowel and bladder) dysfunction, and paraplegia.[2]

The causes of CES include direct or indirect trauma, infection, and spinal cord compression. In addition, a wide range of iatrogenic causes are reported including manipulation, ischemia to spinal cord,[3] direct toxicity from injected local anesthetic agents (concentrated hyperbaric 5% lidocaine) for SA and postoperative complications, e.g., hematoma.[4] Spinal hematomas as seen in our case appears more frequently in patients undergoing platelet antiaggregation treatments or on low molecular weight heparin and in diseases involving coagulopathy.[5-7] Drug-induced thrombocytopenia is another factor associated with spinal hematomas.[8] The development of a spinal hematoma following a so-called "clean" puncture is rare, appearing more frequently in difficult[9,10] and repeated[11] punctures.

Wildförster *et al*.[12] described a case in which 70 years male developed CES due to spinal hematoma. Patient was on anticoagulant therapy due to supraventricular block but was off the anticoagulant therapy when spinal block was given.

Cauda equina syndrome after SA after caesarean section is rarely described entity and after extensive search only few cases are found. In the case described by Jain *et al*.,[13] patient received SA for lower segment caesarean section (LSCS) and three attempts were made before successful anesthesia. CES occurred following uneventful SA. MRI showed thickening and clumping of cauda equina nerve roots at L2-L3 level suggestive of arachnoiditis. There was no epidural abscess, hematoma or spinal canal stenosis. The patient was managed conservatively on heavy doses of steroids. Lower limb weakness gradually improved over 3 months (Grade 2 motor power). In our case, patient received multiple attempts (the exact number not mentioned in the record) for SA in the peripheral hospital and patient was finally operated upon under general anesthesia for LSCS.

In another case,[14] SA was given while intending epidural anesthesia for LSCS and needle induced injury of dilated epidural veins caused epidural hematoma. Patient was successfully managed conservatively as she didn't consent for decompression surgery.

Urgent MRI is the diagnostic modality of choice in suspected cases of CES. Any patient with signs and symptoms of acute CES should undergo emergent MRI imaging or computerized tomography myelography studies to identify the level of compression and to establish the craniocaudal extent and dorsoventral location of the hematoma. CES following spinal hematoma is considered a surgical emergency because if left untreated it can lead to permanent loss of bowel and bladder control and paralysis of the legs. The risk of poor functional outcome is greater in cases in which surgical decompression is delayed for several hours after neurological deficits have occurred. Research has shown that an intradural pressure higher than 70 mmHg is associated with residual neurological deficit in patients with CES.[15] The anatomic location of the hematoma also influences the prognosis that is, whether it is confined to an intradural space, or it is a subarachnoid hemorrhage. Subarachnoid hemorrhage has a worse prognosis because of the negative effects of bleeding on the neural structures. Moreover, the presence of blood in the cerebrospinal fluid may produce a fibroproliferative reaction of the leptomeninges, resulting in arachnoid fibrosis. Some authors have asserted that acute spinal subdural hematoma (ASSH) confined to the lumbar level can be successfully managed by percutaneous drainage, but it is often impossible to remove solid blood clots in this way.[16] Spontaneous resolution of ASSH has been also reported in very rare cases.[17] and there are case reports[14] where conservative management has been done successfully.

CONCLUSION

This case report emphasize the need that practitioners should be aware of neurologic complications of spinal-epidural anesthesia, even in those patients where general anesthesia has been given finally after attempted spinal-epidural anesthesia. Early detection and treatment of the complications are important to minimize the risk of adverse outcome.

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