In conclusion in interstitial lung disease, an unfavorable physiological position increases shunting with an increase in arterial CO$_2$ and widening of arterial alveolar gradient. Prone position is a useful alternative and may improve the ventilation perfusion ratio. An extra corporeal lung device, novalung may be helpful.

Zulfiqar Ali, Talib Khan, Sumaya Syed, Bashir Ahmad Dar, Syed Amir Zahoor
Department of Anesthesiology, Division of Neuroanesthesiology, 1Department of Anesthesiology, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, Jammu and Kashmir, India

Address for correspondence: Dr. Zulfiqar Ali, Department of Anesthesiology, Division of Neuroanesthesiology, Sher-i-Kashmir Institute of Medical Sciences, Srinagar - 190 011, Jammu and Kashmir, India. E-mail: zulfiqaraliiii@yahoo.com

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Unusual delayed presentation of cauda equina syndrome after failed spinal anesthesia

Sir,

Regional anesthesia is safe and commonly used method in obstetric surgery, but sometimes it can cause rare and devastating neurological complication even in uncomplicated cases. We report delayed presentation of
cauda equina syndrome in a healthy obstetric patient after failed spinal attempt.

A 31-year-old female, 2\textsuperscript{nd} gravida with 38 weeks gestation in labor was referred for lower segment caesarean section to our tertiary care center after failed spinal anesthesia attempt at peripheral hospital. After obtaining relevant history and reviewing routine investigations including hemogram, platelet count and coagulation profile, no abnormality was noted. On physical examination of back, multiple puncture marks in the lumber region with no visible swelling was documented. In view of the above findings as well as patient's request, surgery was planned and carried out under standard general anesthesia with rapid sequence induction. Patient was observed perioperatively and discharged on 4\textsuperscript{th} day without any complaints. On 7\textsuperscript{th} postoperative day, patient reported in emergency with complaint of impaired bladder/bowel control along with numbness and weakness in both lower limbs. Neurological workup confirmed impaired sensory and motor function in both lower limbs with the perineal area. Repeat investigations including coagulation profile showed normal study. Immediately magnetic resonance imaging lumbosacral spine was obtained which revealed subdural collection with an extradural extension at L3-L4 level causing significant cord compression with clumping of roots [Figure 1]. Patient was urgently taken up for emergency decompressive laminectomy and the hematoma evacuated from L3-L4 level. Improvement in patient's sign and symptoms was noted 48 h postoperatively. Patient was discharged after 10 days with the return of bladder/bowel control and sensory motor improvement in lower limbs along with advice of follow-up twice weekly. Patient fully recovered by 6 weeks.

A very few cases have reported association of spinal anesthesia with cauda equina syndrome which is typically characterized by varying degree of saddle anesthesia, sphincter dysfunction and paraplegia.\cite{1} In this case, we could only find multiple attempts to put spinal anesthesia and pregnancy as a confounding factor that could have led to slow hematoma formation leading to delayed presentation of cauda equina syndrome. Although bleeding disorders are the greatest risk factors for the development of spinal hematoma, these were conspicuously absent in our patient.\cite{2,3} Other causes like direct trauma to spinal cord, intraneural injection and neurotoxicity\cite{4} were unlikely causes as the treating doctor in peripheral center was unable to get in to subarachnoid space as per record and even patient did not report any neurological symptoms till 7\textsuperscript{th} postoperative day.

In conclusion, always consider a possibility of delayed presentation of cauda equina syndrome with multiple attempts of spinal anesthesia. We strongly suggest strict vigilance to be maintained in patients with multiple spinal attempts irrespective of a normal coagulation profile or any other confounding factor.

Kewal Krishan Gupta, Gurpreet Singh, Amanjot Singh, Mukesh Kumar

Department of Anaesthesiology and Intensive Care, GGS Medical College and Hospital, Faridkot, Punjab, India

Address for correspondence: Dr. Kewal Krishan Gupta, House No. 204, Medical Campus, Faridkot - 151 203, Punjab, India. E-mail: doc_krishan31@yahoo.co.in

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Figure 1: Magnetic resonance imaging lumbosacral spine — showing collection at L3-L4 level

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