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SHORT REPORT

Intravenous Dexmedetomidine Sedation For Spinal Anesthesia in the Prone Knee-Chest Position For Lumbar Laminectomy Surgery

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Lumbar disc hernia is a frequent pathology whose treatment is essentially surgical. Therefore, either general anesthesia with intubation and controlled ventilation or neuraxial blocks such as epidural or spinal are required.

Although spinal anesthesia has been proved to be superior or an alternative to general anesthesia for lumbar laminectomy (1-3), general anesthesia remains the first choice for most of the anesthesiologists because of the potential for inadvertent increases in sensomotory blockade and the difficulty of managing cardiopulmonary complications or inducing general anesthesia in cases of failures (4).

However, there is still controversy over the use of i.v. sedation during spinal anesthesia especially for operations performed in the prone knee-chest position (5). The present case report describes the administration of i.v. dexmedetomidine sedation for spinal anesthesia in the prone knee-chest position.

Case Report

A 38-year-old woman suffering from backache and left leg pain was scheduled to undergo laminectomy under spinal anesthesia because of a difficult intubation history during her previous cesarean section. Her physical examination was unremarkable except for hypoesthesia at L_5-S_1. All her laboratory results including prothrombin (12.6 s) and activated prothromboplastin time (25 s) were within the normal range. On the preoperative visit, the Mallampati score was evaluated between III and IV. When the patient was consulted by an otorhinolaryngologist, the vocal cords were evaluated as normal with a highly placed epiglottis. On arrival in the operating room, heart rate (HR), noninvasive arterial blood prsessure (BP), and peripheral oxygen saturation (SpO_2) were monitored. Preoperative arterial BP was 130/70 mmHg, HR was 80 beat min-1 with a sinus rhythm and SpO_2 was 95% while breathing room air. Preloading with i.v. 500 ml of Ringer's lactate solution was done and midazolam 1 mg i.v. was administered to relieve anxiety. Then the patient was turned to prone and 3 L min^{-1} of nasal oxygen supplementation was started by a face mask beginning from the preparation for spinal block induction. Following skin disenfection by iodine, 2 ml of 2% lidocaine was infiltrated into the skin. A 26 Gauge (G) pencil point Atracaun spinal needle with introducer was inserted in the midline at the L3-4 interspace in the operative prone knee-chest position. After several needle advances and failed dural punctures confirmed by the absence of cerebrospinal fluid (CSF) in the aspiration, the patient was turned to the lateral decubitus position and a new trial for midline lumbar puncture was performed with a 22 G Quincke spinal needle at the same interspace. On the first trial, clear CSF reflux was achieved and 2.5 ml of 0.5% bupivacaine (5 mg ml^{-1}) plus 12.5 µg fentanyl (25 µg ml^{-1}) were injected in the subarachnoid space. Sensorial block and anesthesia levels reached T_6 and T_8, respectively. Before surgeons were allowed to start the operation, 1 µg kg^{-1} i.v.

dexmedetomidine was infused in 10 min as the initial loading dose followed by 0.2 μg kg^{-1} h^{-1} infusion for maintenance until the end of the operation. Forty-five minutes after the onset of infusion, HR decreased to 42 beat min^{-1} which was immediately treated with atropine i.v. 0.5 mg, when HR returned to its baseline value. The operation lasted 2.5 h. The patient was observed for 1 h in the post anesthesia care unit (PACU) and the block regressed to T_{12} during the first 10 min follow-up.

The patient was discharged on the 2nd postoperative day after an uneventful postoperative course. Postoperative analgesia was provided by meperidin 50 mg i.m. when necessary. There were no complaints either at the time of discharge or on check-up 1 month after the operation.

We are the first to present successful management of i.v. supplementation of dexmedetomidine; an alpha-2 receptor agonist having potent sedative, anxiolytic and analgesic properties without significant ventilatory depression (6), in a patient scheduled to undergo lumbar laminectomy surgery under spinal anesthesia to provide intraoperative sedation in the prone knee-chest position.

Spinal anaesthesia has been shown to be an effective alternative to general anaesthesia for elective lumbar spine surgery with a reduced rate of minor complications in a study including 611 patients (2). Light i.v. sedation with various drugs in patients under spinal anaesthesia in the prone position has been administered (1,5). Recently, dexmedetomidine versus propofol used for intraoperative sedation were compared for surgical procedures performed under regional anesthesia such as epidural, spinal or peripheral blocks (7), but intravenous dexmedetomidine for intraoperative sedation has not been used during spinal anesthesia in the prone position.

The prone position for spinal anesthesia induction is generally used for anorectal procedures to be performed in the prone jackknife position (8). Only may one interesting emergency of spinal anesthesia induction in the prone position for surgery ensuing in the supine position has been reported (9). We planned spinal anesthesia because of a difficult intubation history. We considered inducing spinal anesthesia in the operative prone knee-chest position at the beginning. However, we were unable to perform a lumbar puncture in this position. Therefore, we moved the patient from the prone to the lateral decubitus position and replaced the 26 G pencil point spinal needle with a 22 G Quincke needle. Afterwards we successfully performed the lumbar puncture on the first trial. As soon as we finished the injection of intrathecal drugs, we turned the patient to the operative prone knee-chest position to avoid unilateral block.

There might be several reasons for the unsuccessful induction of spinal anaesthesia in a patient in the prone position (9). In the present case report, the difficulty in positioning the patient on the operating table and inadequate experience could be counted.

Among spinal anesthetic drugs Plain 0.5% bupivacaine is associated with the lowest incidence of supplemental local anesthetic use intraoperatively and it is slightly hypobaric at body temperature (8,10). For that reason, we administered the combination of 2.5 mg plain bupivacaine and 12.5 μg fentanyl and provided a good quality of surgical anesthesia requiring no additional drug until the end of the operation.

We selected i.v. dexmedetomidine for sedation and to relieve the discomfort of the patient in the prone knee-chest position for a 2.5 h operation. While the initial loading dose for i.v. dexmedetomidine we used (1 μg kg^{-1}) was similar, the maintenance dose for intraoperative sedation (0.2 μg kg^{-1} h^{-1}) was almost half the lower limit of the suggested dose (7). However, our patient remained sedated when undisturbed, but was roused readily with stimulation and maintained spontaneous breathing with the present dose regimen.

Despite hypotension and bradycardia, which might occur during ongoing therapy with dexmedetomidine (8), we observed only bradycardia 45 min after the onset of surgery, which immediately responded to i.v. atropine and remained within normal limits throughout the operation.

Spinal anesthesia, which has been proved to be superior or an alternative to general anesthesia for lumbar laminectomy, did not attain its real value because of the patient's discomfort in the prone position. In conclusion, spinal block supplemented with i.v. dexmedetomidine sedation may be beneficial to overcome the discomfort of the patient due to the prone position.

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References

1. Jellish WS, Thalji Z, Stevenson K et al. A prospective randomized study comparing short- and intermediate- term perioperative outcome variables after spinal or general anesthesia for lumbar disk and laminectomy surgery. Anesth Analg 83:559-564, 1996.
2. Tetzlaff JE, Dilge JA, Kodsy M et al. Spinal anesthesia for elective lumbar spine surgery. J Clin Anesth 10: 666-9, 1998.
3. Becq MC, Verdin M, Riegel B et al. Hemodynamic effects of genu-pectoral position during the surgery of lumbar disk herniaiton: spinal anesthesia versus general anesthesia. Agressologie 34: 49-50, 1994.
4. Standl T, Burmeister MA, Hempel V. Is spinal anesthesia for operations in the prone or prone jackknife position suitable? Anaesthesist 48: 572-3, 1999.
5. Laakso E, Pitkanen M, Kytta J, Rosenberg PH. Knee-chest vs horizontal side position during induction of spinal anaesthesia in patients undergoing lumbar disc surgery. Br J Anaesth 79: 609-11, 1997.
6. Aitkenhead AR, Rowbotham DJ, Smith G, Textbook of Anaesthesia, 4th ed, Churchill Livingstone, London, 2001, pp:196
7. Arain SR, Ebert TJ. The efficacy, side effects, and recovery characteristics of Dexmedetomidine versus propofol when used for intraoperative sedation. Anesth Analg 95: 461-6, 2002.
8. Morgan GE, Mikhail MS, Murray MJ, Larson CP. Clinical Anesthesiology, McGraw-Hill, New York, 2002, pp:264.
9. Larsen JR. Emergency spinal anaesthesia in the prone position. Acta Anaesthesiol Scand 41:790-1, 1997.
10. Horlocker TT, Wedel DJ. Density, specific gravity, and baricity of spinal anesthetic solutions at body temperature. Anesth Analg 76:1015-8, 1993.