CASE REPORTS

Awake Laminotomy and Discectomy using Dexmedetomidine as Anesthetic

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Lumbar discectomy is the most common surgical procedure performed in the United States for patients having back and leg symptoms. The vast majority of the procedures are elective and are performed under general anesthesia. This is a reported case of a 40 year old woman with worsening symptoms of L5-S1 disc herniation unresponsive to conventional therapies. The use of Dexmedetomidine was discussed with the patient, explaining the advantage of motor and sensory testing during the surgery and immediate patient feedback. Awake laminotomy and discectomy could be performed as an ambulatory procedure, since the use of Dexmedetomidine as the main anesthetic represents a safe and convenient alternative to general anesthesia in this patient with lumbar disc herniation.

Key words: Dexmedetomidine, Alpha2-agonists, Discectomy, Laminectomy, Ambulatory

Lumbar discectomy is the most common surgical procedure performed in the United States for patients having back and leg symptoms; the vast majority of the procedures are elective and are performed under general anesthesia (1).

Case Report

This is a case report of a 40 year-old woman with worsening symptoms of L5-S1 disc herniation unresponsive to conventional therapies. Patient was scheduled for awake laminotomy and discectomy of affected disc. The use of Dexmedetomidine was discussed with the patient, explaining the advantages of motor and sensory testing during the surgery and immediate patient feedback.

Dexmedetomidine infusion was started at 0.8 mcg/kg/hr. Patient was placed in the prone position. Forty-five minutes after the infusion had begun a right paramedian incision was done. During the laminotomy, the infusion of Dexmedetomidine was increased to 1 mcg/kg/hr. Before closing the lamina, the rate of the infusion was decreased to 0.5 mcg/kg/hr. At the end of the surgery, the infusion of Dexmedetomidine was discontinued, after having lasted exactly two hours. Motor testing of lower extremities was performed during, and at the end of the surgery, and the patient was awake and able to walk, giving us immediate feedback that she was relieved of pain. She also reported being comfortable during the procedure. Then, the patient placed herself on the stretcher with minimal assistance, and was taken to the post anesthesia care unit with stable vital signs. After 48 hours in the ward, the patient was discharged with normal muscle strength and no neurological deficits.

Discussion

Dexmedetomidine is a short-acting, highly selective and potent alpha2-adrenergic agonist, working through activation of central nervous system alpha2 receptors, with several desirable pharmacologic properties, including sedation, anxiolysis, hypnosis, analgesia, amnesia, antisialagogue effects, and a unique respiratory-sparing effect (2-4). The sedative effect produced by Dexmedetomidine has a different quality than that produced by other intravenous anesthetics in that it resembles a physiologic sleep state through activation of endogenous sleep pathways (2). This property gave us the advantage of performing motor testing during the operation, and the patient was able to provide immediate feedback that her right leg paresthesia had disappeared.

Due to the prone position required for the surgical procedure, airway patency and respiratory depression were a concern. We were able to keep a patent airway, by carefully titrating the anesthetic to an adequate level without causing excessive sedation. Dexmedetomidine also has minimal ventilatory effects because one of its sites of action is the locus ceruleus, which is known to play a

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role in both respiratory control and sleep modulation; and because Dexmedetomidine converges on the natural sleep pathway to exert its sedative effects, whereas natural sleep does result in ventilation modulation (5).

Dexmedetomidine, has been associated with hemodynamic adverse effects such as bradycardia and hypotension (4). An initial hypertensive response usually occurs when using high doses given at a fast rate, secondary to stimulation of the peripheral alpha2-receptors (4). However, the patient's blood pressure and heart rate remained stable during the procedure, and the initial hypertensive response did not occur.

Lumbar disc herniations from intervertebral disc degeneration are common in elders (6), who also might have other co-morbidities. Therefore awake procedures would offer more benefits and fewer complications related to general anesthesia in this population.

This patient could be discharged in 24 hrs or less. A shorter hospital stay would represent a savings both to the patient and the hospital.

Conclusions

Awake laminotomy and discectomy could be performed as an ambulatory procedure, since the use of Dexmedetomidine as main anesthetic represented a safe and convenient alternative to general anesthesia in this patient with lumbar disc herniation.

Resumen

La disectomía lumbar es el procedimiento quirúrgico más frecuente en Estados Unidos para pacientes con síntomas de espalda y piernas. La gran mayoría de estos procedimientos son electivos y se realizan bajo anestesia general. Este es el caso de una mujer de 40 años de edad con empeoramiento de los síntomas de herniación del disco de L5-S1, que no responde con tratamiento convencional. El uso de Dexmedetomidina fue discutido con la paciente, explicándole la ventaja de poder realizar monitoreo sensorial y motor durante la cirugía así como de ofrecer retroalimentación inmediatamente. Las laminectomías y discectomías con el paciente despierto pudieran realizarse de forma ambulatoria ya que el uso de Dexmedetomidina representa una alternativa segura y conveniente al uso de anestesia general en estos pacientes.

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