

The use of opioids in a pregnant woman with lumbar disc herniation: A case report

Emi Matsumoto, MD
Kazuaki Yoshimura, MD
Eiichiro Nakamura, MD
Toru Hachisuga, MD
Masamichi Kashimura, MD

ABSTRACT

It is not easy to diagnose lumbar disc herniation during pregnancy due to the limitation of the examinations and it is also difficult to control the severe pain during this time. A pregnant woman with lumbar disc herniation was transferred to our hospital at the 23rd week of gestation. The pain was successfully controlled with opioids and epidural anesthesia. At the 35th week of gestation, she delivered a girl weighing 2316 g smoothly with an Apgar score of 8/9 without neonatal abstinence syndrome from morphine. In this case, opioid administration was found to be useful for perinatal care with lumbar disc herniation.

Key words: opioid rotation, pregnancy, lumbar disc herniation, neonatal abstinence syndrome

INTRODUCTION

More than 50 percent of all pregnant women suffer from lower back pain during pregnancy.¹ The etiology of lower back pain in pregnancy is multifactorial. The etiology and the pathophysiology are poorly understood. Although lumbar disc herniation is important in a differential diagnosis, the diagnosis tends to be delayed due to the limitations of the examinations possible during pregnancy. In the case of lumbar disc herniation, if a patient complains of severe pain in early pregnancy, it is very difficult to control the pain until the sufficient gestational weeks for fetal extrauterine life for the reasons mentioned below. Non-steroidal anti-inflammatory drugs (NSAIDs) are forbidden during pregnancy² and long term usage of epidural catheter

increases the risk of infection. Although oral opioid is an analgesic, potential and relatively safer than the NSAIDs for pregnant women, only a few cases have been reported. However, on a world-wide scale, opioid usage is thought to be a very useful option for pain control during pregnancy.³ We present here a case, where opioids were used successfully on a pregnant woman with lumbar disc herniation.

CASE (FIGURE 1)

A 32-year-old Japanese woman (gravida 2 para 1) arrived at a hospital other than our own at 10 weeks of gestation complaining of intolerable lower left extremity pain. At 12 weeks of gestation, the pain increased to sharp pain, beginning in the left buttock and radiating to the left anterior thigh (the area of L4 nerve root). The patient also showed symptoms of paresthesia and atrophy of the thigh. Although she was prescribed acetaminophen, pentazocine, and steroids for her pain, those analgesics showed little effect. Therefore, she was transferred to our hospital at 23 weeks of gestation. Magnetic resonance imaging (MRI) was performed for further evaluation, which revealed degenerative disk disease with a lateral disc herniation at L4/5. Neurological findings showed the disturbance of left L4 nerve root, ie, (1) Left femoral nerve stretch test was positive. (2) Hyperalgesia was detectable in the L4 dermatome of the left leg by pin prick test. (3) Loss of strength in the left iliopsoas and quadriceps. (4) Patellar reflex was absent only in the left leg. We started to use the epidural anesthesia with 0.2 percent of Ropivacaine at 5 ml/h and 8 mg of dexamethasone per day. We

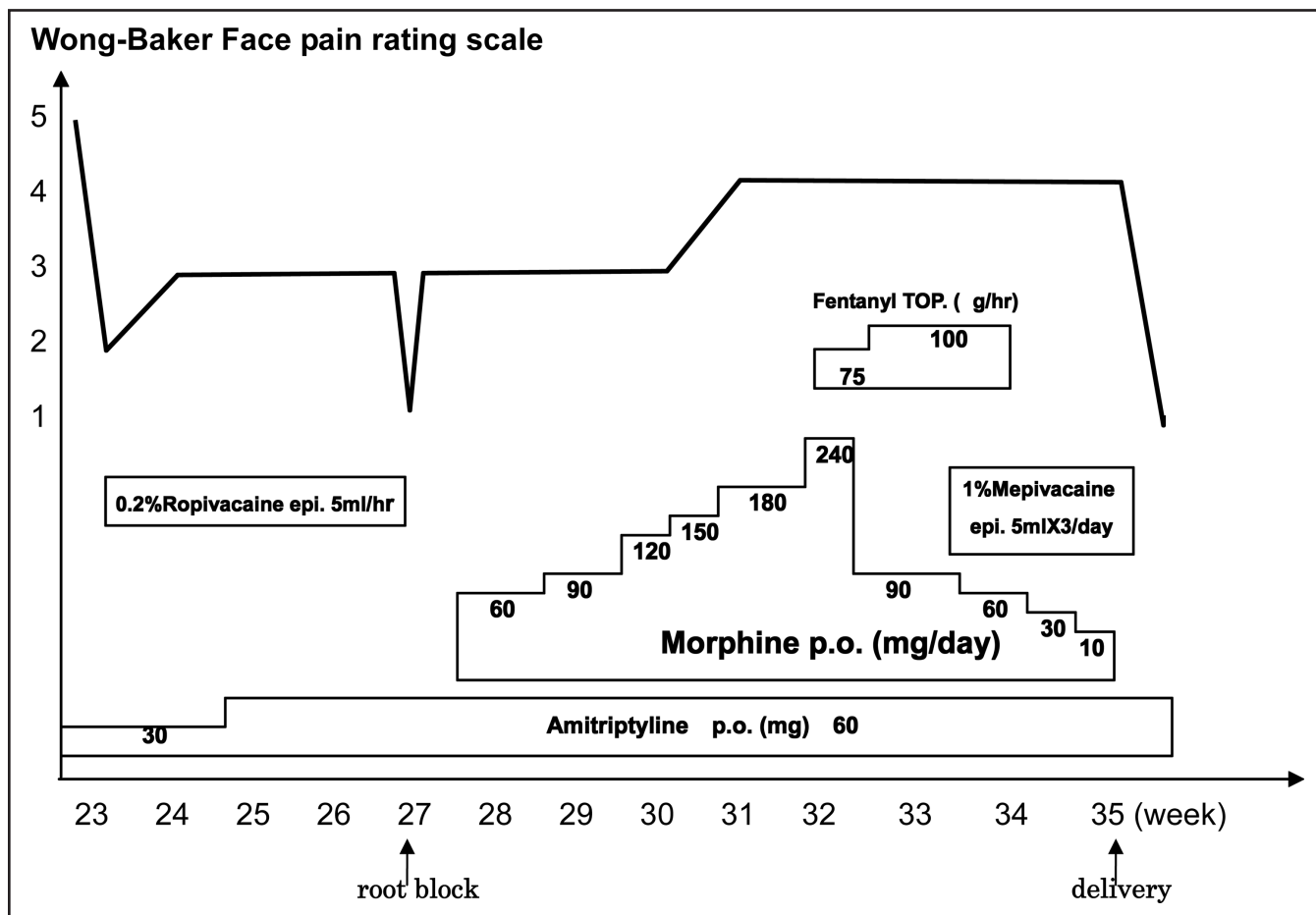


Figure 1. Perinatal course of the case. Total dosage of morphine is the sum of slow-release morphine and immediate-release morphine. The patient daily expressed the amount of pain with the Wong-Baker Faces pain rating scale.⁴ Pain was assigned ratings from 0 to 5, with 0 for no pain and 1 to 5 for increasing intensities of pain. The patient was asked to choose the appropriate face according to her felt pain.

began administration of amitriptyline (30 mg) to improve the pain control. Despite epidural anesthesia and an increase of amitriptyline (up to 60 mg), her pain worsened. Her paresthesia of the left leg continued and sensation of the left foot decreased. Her Wong-Baker Face pain rating scale gradually increased from 2 to 3. The selective nerve root block was chosen for therapy and diagnosis. Her pain was completely relieved for only approximately one full day, which indicated that root block was not eligible as a viable therapy. However, it provided information about the cause of intolerable pain. The cause was the extraforaminal lateral disc herniation at the fourth lumbar-root. At 26 weeks of gestation, we had to remove the epidural catheter (after 3 weeks of usage) to avoid the risk of infection. At this point, we had to find other treatment options for the pain control.

Laminectomy and neurosurgical procedures are not an option during pregnancy, therefore noninvasive

therapy was initiated. We decided to administer morphine orally with informed consent of the patient. At 27 weeks of gestation, we started to use a slow-release type of morphine orally (60 mg) and an immediate-release type of morphine for breakthrough pain. The morphine dosage was increased to 240 mg per day at 31 weeks of gestation, and we changed the oral morphine to topical fentanyl as opioid rotation for better pain control. A fentanyl patch (up to 100 µg/h) was applied topically and the daily dosage of oral morphine was reduced to 90 mg.

At 33 weeks of gestation, an epidural catheter was placed at the L2/3-level, and Mepivacaine (0.05 mg) was administered three times per day. The fetal condition was confirmed to be at a reassuring status by cardiotocogram and ultrasound sonography, and we planned induction of vaginal delivery at 35 weeks of gestation. A girl weighing 2316 g was delivered without complications with an Apgar score of 8/9 at 1/5

minutes after delivery, respectively. The baby, in a stable condition, was transferred to a neonatal intensive care unit for further monitoring. There were no signs of respiratory depression or opioid abstinence syndrome from morphine. After the delivery, the patient's pain level decreased dramatically and adequate pain relief was possible with administration of only 400 mg per day of oral acetaminophen. The reason for this dramatic relief of pain is presumed to be the combination of the return to a normal spinal posture and the reduction of intra-abdominal pressure. This combination seems to have assisted in the reduction of her hernia related pain. One week after delivery, the mother and child were discharged from the hospital without any further complications.

DISCUSSION

The management of severe pain during pregnancy is difficult when considering the risks and benefits for the mother and fetus. Because of fetal immaturity, especially in the second trimester of pregnancy, it is difficult to induce delivery for the sake of intensive pain control. The pregnancy must be continued until at least around 34 weeks of gestation. Epidural anesthesia is a useful procedure to help control pain during pregnancy without fetal risk. However, because of the risk of infection for this mother due to prolonged maintenance and management of the epidural catheter, we had to remove the catheter after 3 weeks of usage. The catheter was removed at 26 weeks of gestation, thus we had to find another option. NSAIDs are the most popular analgesic potentials and do not influence fetal organ development directly. However, the use of NSAIDs during pregnancy should be avoided because of (A) the isolated closure of the ductus arteriosus, (B) transient renal dysfunction, (C) decreased amniotic fluid volume, and (D) delay of the onset of labor.² Besides NSAIDs, morphine is one of the strongest analgesic potentials and its epidural administration acts locally on the spinal cord and its oral administration raises the peripheral pain threshold but the administration must be closely monitored. In this case, the usage of morphine proved to be safe for the mother and fetus, and was effective in relieving pain until the sufficient gestational weeks for fetal extrauterine life. Tricyclic antidepressants such as amitriptyline are reported to have analgesic effectiveness⁵ and be effective to control severe neuropathic pain.⁶

There are some well-documented clinical reports in the review of Wunsch et al. that pain was successfully controlled by opioids.³ The most common adverse fetal effect among drug abusing mothers is opioid abstinence syndrome. Schneider et al. reported that six neonates from morphine abusing mothers with an average intake of 412 mg (range 250-600 mg) morphine per day had to be hospitalized for 3 weeks due to prolonged opioid abstinence syndrome. When feasible, the weaning off of opioids should begin as early as possible to minimize the severity and duration of postpartum opioid abstinence syndrome. Most infants will show signs of withdrawal syndrome within 48 hours; however, a late onset of withdrawal symptoms up to day 14 postpartum has also been reported.⁷ The duration of the opioid abstinence syndrome shows wide variation and may persist up to 3 months.⁸ Sabatowski et al. reported a similar case of multiple herniated discs whose pain was controlled by oral and epidural administration of opioids between 30 to 37 weeks of gestation.⁹ She was administered oral morphine and epidural fentanyl at the time of cesarean delivery and the neonate required symptomatic treatment with morphine for 3 days to control the abstinence symptoms. Our management of the morphine dosage reduction to zero and the switching to the usage of epidural anesthesia prior to delivery was successful in avoiding opioid abstinence syndrome completely. It was much more difficult to extend gestational age from 23 weeks of gestation in our case.

In addition, switching the opioids (opioid rotation) should be considered for prolonged opioid usage. The placental permeability of drugs is related to its molecular weight, lipophilic and the rate of protein combination. Opioids can easily pass the placenta due to their small molecular weight (ie, 285). Considering that the fetal blood-brain barrier is undeveloped, the translatability of the morphine to fetus is presumed to be high. Therefore, if a high oral dosage of morphine is necessary, administration should be switched to a different form for the purpose of obtaining sufficient pain control with minimal dosage.

In summary, pain control with opioids for pregnant women (until the sufficient gestational age for fetal extrauterine life) is a useful option for improving the fetomaternal prognosis. It is important to consider changing the administration route and the opioid types with the usage of epidural anesthesia to prevent adverse effect for the mother and the fetus.

Emi Matsumoto, MD, Department of Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.

Kazuaki Yoshimura, MD, Department of Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.

Eiichiro Nakamura, MD, Department of Orthopedic Surgery, University of Occupational and Environmental Health, Fukuoka, Japan.

Toru Hachisuga, MD, Department of Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.

Masamichi Kashimura, MD, Department of Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.

REFERENCES

1. Orvieto R, Achiron A, Ben-Rafael Z, et al.: Low-back pain of pregnancy. *Acta Obstet Gynecol Scand.* 1994; 73: 209-214.

2. Rathmell JP, Viscomi CM, Ashburn MA: Management of nonobstetric pain during pregnancy and lactation. *Anesth Analg.* 1997; 85: 1074-1087.

3. Wunsch MJ, Stanard V, Schnoll SH: Treatment of pain in pregnancy. *Clin J Pain* 2003;19:148-55.

4. Whaley L, Wong D: *Nursing Care of Infants and Children*, 3rd ed. St Louis: Elsevier Science, 1987: 1070 p.

5. McQuay HJ, Tramer M, Nye BA, et al.: A systematic review of antidepressants in neuropathic pain. *Pain.* 1996; 68: 217-227.

6. Kalso E, Tasmuth T, Neuvonen PJ: Amitriptyline effectively relieves neuropathic pain following treatment of breast cancer. *Pain.* 1996; 64: 293-302.

7. Schneider C, Fischer G, Diamant K, et al.: Pregnancy and drug dependence. *Wien Klin Wochenschr.* 1996; 108: 611-614.

8. Viscomi CM, Rathmell JP, Pace NL: Duration of intrathecal labor analgesia: early versus advanced labor. *Anesth Analg.* 1997; 84: 1108-1112.

9. Sabatowski R, Radbruch L, Grond S, et al.: Treatment of severe low back pain with opioids during pregnancy in a patient with incomplete tetraplegia. *Acta Anaesthesiol Scand.* 2000; 44: 348-350.