Anesthesia for cesarean section for achondroplastic dwarf: A case report

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This case report discusses the preanesthesia plan, actual anesthesia administration, and the postanesthesia course involving a gravid achondroplastic dwarf. The need for discussion of all anesthesia options when planning the anesthesia care associated with uncommon disorders and pregnancy is illustrated.

Key words: Achondroplasia, anesthesia, pregnancy, cesarean section.

Introduction

A 24-year-old woman, gravida 1, para 0, was examined at 32 weeks' and 6 days' gestation with a single fetus for preanesthesia consultation. The patient was an achondroplastic dwarf, and the obstetrical plan was to perform a cesarean section at approximately 38 weeks' gestation.

The patient's pregnancy had been uneventful, with a 25-lb weight gain. Previous surgery included a tonsillectomy at approximately 2 years of age, which was uneventful. There was no family history of anesthesia or surgical complications. Both the patients' parents are of normal physical stature and condition. The patient's history included no relevant conditions, and she was taking prenatal vitamins and had no known allergies.

The physical examination revealed a cooperative patient who was 48 inches tall and weighed 150 lbs. The patient had exaggerated lumbar lordosis but with remarkable flexion. There was no evidence of cervical spine instability. Her maxilla was small, but there was good mandibular range of motion. The patient had some evidence of osteochondrodysplasia, by report, in bone growth and cartilage development, involving the limbs. The patient denied any cervical or lumbar neurologic symptomology, presently or in the past (Table 1).

Results of the patient's diagnostic fetal ultrasound at 32 weeks' gestation were within normal limits. However, because of constricted bony pelvis, the obstetric staff believed cesarean section was the approach of choice. The patient was knowledgeable about her condition and history. Before discussion of anesthesia options, the patient stated she wanted to be awake during the surgical procedure and wanted to be treated as any other patient in a similar situation.

All anesthesia options were described to this patient. The technical difficulty of regional anesthesia and the complications associated with achondroplasia and pregnancy were discussed thoroughly. Concerns with general anesthesia and the complications associated with achondroplasia were similarly reviewed (Table 2).

Table 1. Associated major abnormalities in dwarfism

- Atlantoaxial instability
- Spinal stenosis
- Airway and facial abnormalities
- Thoracic dystrophy
- Pectus carinatum
- Scoliosis, kyphosis, lordosis
- Cardiac abnormalities
- Hydrocephaly
- Mental retardation
- Seizure disorders
- Tracheal compression during head and neck flexion

Table 2. Major anesthetic considerations

- Preanesthetic evaluation of the airway and neck stability
- Maintenance of a neutral neck position during manipulations
- Small endotracheal tube and difficult airway cart availability
- Careful documentation of preoperative neurologic deficits
- Spinal stenosis; vertebral misalignment may complicate a regional approach
- Postoperative ventilatory problems are common
- Specific drug contraindications are not apparent
- Meticulous technique and attention to detail are most important

The patient agreed to a spinal anesthetic. She understood there were no guarantees and that there was a risk of high spinal or failed regional block, requiring conversion to general anesthesia.

Case summary

At 39 weeks' gestation the patient was admitted for elective cesarean section. The anesthesia plan again was completely reviewed, and she wanted to continue as planned. The patient had taken nothing by mouth for 10 hours before arriving at the hospital.

The patient was taken to the operating room at 8:30 AM and given a 500-mL fluid bolus of 6% hetastarch in 0.9% sodium chloride injection (Hespan, DuPont Pharma, Wilmington, Del). Electrocardiogram leads, a blood pressure cuff, and a pulse oximeter were attached, and, after baseline data were recorded, the patient was placed in the sitting position for a spinal anesthetic.

A Gertie Marx, (International Medical Development, Inc. USA, Park City, Utah) 24-gauge, pencil-point spinal needle was placed at L3-L4 without paresthesia, and 11 mg of spinal bupivacaine, 0.75% in dextrose, with 25 μg of fentanyl and 0.3 mg of preservative-free morphine sulfate solution was injected. The patient remained sitting after injection for 45 seconds and was then placed in a supine position with a wedge placed under the right hip. The sensory anesthesia level was determined to be T4, and the patient was prepped and draped. Before incision, the anesthesia level again was determined and found to be T4. The surgical delivery was somewhat difficult, due to fetal size.

The patient delivered a viable boy at 9:02 AM with Apgar scores of 8 at 1 minute and 9 at 5 minutes. The patient was given oxytocin and cefotetan disodium 1 g after the umbilical cord was clamped. The patient required no other medication throughout the procedure. The anesthetic was uneventful, with systolic blood pressure ranging from 120 to 104 and diastolic from 70 to 50; the oxygen saturation remained at 99% with 2 L of oxygen throughout. The heart rate ranged from 80 to 90 beats per minute, and the respirations remained normal.

The patient was taken to the postanesthesia care unit at 9:35 AM, and she was awake and in stable condition. Her urine output was 550 mL, and the estimated blood loss was 800 mL; 2,600 mL of fluid was administered.

The patient complained of a slight feeling of nausea approximately 45 minutes postoperatively and was given 4 mg of ondansetron hydrochloride intravenously. She was discharged from the postanesthesia care unit at 10:45 AM in stable condition with no complaints.

The patient's blood pressure, oxygen saturation, and electrocardiographic activity were monitored continuously for the first 12 hours after surgery. The patient required no pain medication until 8:00 AM the next day, and an oxycodone-acetaminophen combination drug was given orally. The patient and neonate were discharged from the hospital on postoperative day 4.

Discussion

Bupivacaine for spinal anesthesia has a dose range of 7.5 mg to 15.0 mg. We have found in our institution that the usual and customary dose of

spinal bupivacaine for cesarean section is 12 mg. The dose of medication for spinal anesthesia is lowered slightly for unusually short patients and raised slightly when the block is placed with the patient in the sitting position.[1] We have found, as reported in much of the literature,[2] 25 μg of fentanyl placed in the solution enhances the efficacy of the local anesthetic. Preservative-free morphine sulfate (Duramorph) was used in the solution for postoperative pain control. We have found that 0.3 mg works well.

Regional and general anesthesia present risks for patients with achondroplastic dwarfism, as shown in Table 2. A complete history and physical examination can help reduce the risks. Inspection of the range of motion of the head and neck, assessing potential airway difficulties, and considering neurologic and respiratory complications before administration of the anesthetic is essential (see Table 1). The plan for general or regional anesthesia should be based on each individual case and judged on the merits of each case. Fluid bolus may not be well tolerated with regard to regional anesthesia. Intubation difficulties and increased risk of aspiration are important considerations. The benefits of postoperative pain management with morphine should be considered carefully against the risks. Patients with achondroplastic dwarfism should be examined early in the prenatal period to establish a safe anesthesia plan tailored to their individual needs.

REFERENCES

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