

## CASE REPORTS

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## Anesthesia for Cesarean Section in a Pituitary Dwarf

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PROVIDING anesthesia for parturient patients with dwarfism is an uncommon problem faced by anesthesiologists. We describe the anesthetic management for cesarean section in a patient with pituitary dwarfism.

### Case Report

A 29-yr-old healthy primiparous woman (height, 124.75 cm [4 ft, 1 in]) was seen at 36 weeks' gestation for anesthetic consultation before elective cesarean section. Her parents were of normal stature, and her other siblings were taller than 5 ft. At physical examination, she was short but normally proportioned. Her height was in the fiftieth percentile for a 7-yr-old girl, and her weight was 35.2 kg (prepregnancy weight, 27.2 kg). Mouth opening, dentition, and tongue size were proportionately normal with a Mallampati class II airway.<sup>1</sup> Neck flexion and extension were normal. Her spine was proportionately short with normal curvatures and had easily palpable lumbar interspaces. Laboratory studies revealed an abnormally low level of growth hormone, but all other endocrinologic studies and blood glucose levels were normal. Uterine ultrasonography performed at 36 weeks revealed a normally proportioned fetus with an estimated fetal weight of 2,932 g. Continuous lumbar epidural anesthesia was planned for cesarean delivery at 39 weeks' gestation.

Just before surgery, 1 l lactated Ringer's solution was administered,

and routine monitors were placed. The epidural space was identified at a depth of 3 cm, and a 20-gauge multiorifice epidural catheter was placed easily using an 18-gauge Tuohy needle. After administration of a negative test dose of 2 ml lidocaine, 2%, with 1:200,000 epinephrine, 12 ml of this anesthetic mixture with 50 µg epidural fentanyl was titrated to provide surgical anesthesia. A T3 sensory level was achieved with this dose. After delivery of a 2,580-g normal-appearing infant, 2 mg epidural morphine was administered. The patient required three doses of intravenous nalbuphine in the first 10 h postoperatively for analgesia, and her recovery was uneventful.

### Discussion

This is the first report describing the anesthetic management for cesarean section in a woman with pituitary dwarfism. *Dwarfism* is defined as the failure to achieve a height of 4 ft 10 in (148 cm) at maturity.<sup>2</sup> Dwarfism affects 20,000-100,000 people in the United States, and more than 100 types of dwarfism exist.<sup>3</sup>

People with pituitary dwarfism, who have a human growth hormone (hGH) deficiency, appear child-like even as adults, with normally proportioned limbs and trunk. During pregnancy, the uterus becomes an intraabdominal organ early in gestation, and fetal growth may lead to encroachment on the diaphragm as early as 28 weeks' gestation.<sup>4</sup> Tyson<sup>4</sup> reported a pregnant woman with pituitary dwarfism who, at 30 weeks' gestation, had tachypnea and decreased vital capacity, which progressed to oxygen desaturation and respiratory acidosis at 35 weeks' gestation, necessitating cesarean delivery. The pelvic diameters of persons with pituitary dwarfism usually are only adequate for delivery of a preterm infant.<sup>4</sup>

Berkowitz<sup>3</sup> recently described the anesthetic consid-

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erations for people with dwarfism, with an emphasis on the disproportionate group. General anesthesia administered to people with disproportionate dwarfism may be associated with difficulties in airway management, cervical spine instability, and potential spinal cord trauma with neck extension.<sup>3</sup> However, most people with pituitary dwarfism have a proportionately smaller airway without anatomic abnormalities. A short laryngoscope handle and a range of blades and oral or nasal airways appropriate for a pediatric patient should be available for the patient with pituitary dwarfism. Walts *et al.*<sup>5</sup> addressed the question of appropriate endotracheal tube size in their series of people with disproportionate dwarfism or patients with proportionate small stature, but they were unable to make a recommendation. We suggest that, in adults with pituitary dwarfism, an estimate of proper endotracheal tube size might be made from the patient's height, choosing the appropriate endotracheal tube range for children of normal height. We recommend the use of a cuffed endotracheal tube in pregnant patients with dwarfism to guard against pulmonary aspiration of gastric contents.

Because guidelines for appropriate local anesthetic dosage for regional anesthesia in patients with pituitary dwarfism are lacking, we chose continuous lumbar epidural anesthesia to allow careful titration of the anesthetic level. Our patient was administered surgical anesthesia after delivery of 12 ml local anesthetic (240 mg lidocaine) and 50  $\mu$ g epidural fentanyl. We administered 40 mg lidocaine as a test dose, which would have produced a detectable subarachnoid block with a low risk of an undesirably high or total spinal anesthetic. The 10  $\mu$ g epinephrine administered probably would have caused tachycardia if intravascular because it is a larger

dose on a weight basis than the accepted 15- $\mu$ g dosage used in patients of normal stature.<sup>6</sup> We reduced the dose of epidural morphine from our usual 4 mg to 2 mg, to avoid respiratory depression. The reduced dose is similar to that recommended for pediatric caudal anesthesia for lower abdominal surgery.<sup>7</sup> However, the patient required three doses of nalbuphine for pain relief in the first 10 h postoperatively, which is more than is usually necessary.

In summary, we report a case of epidural anesthesia for cesarean section in a patient with pituitary dwarfism. The normally proportioned dwarf is distinctly different from the more common disproportionate type and has different anesthetic considerations. With respect to anesthetic management, the patient with pituitary dwarfism probably is more similar to a pediatric patient than to a normal-sized adult.

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