

practice. Decreasing the dose of bupivacaine from a 0.25% bolus/0.125% maintenance (as in the method of Thorp *et al.*¹) to a 0.1125% bolus/0.03–0.06% maintenance combined with opioid, Naulty *et al.* found a significant reduction of cesarean section rate to 10%.² Recently, two reports from Chestnut *et al.* described cesarean section rates of 18% and 19% for nulliparous women receiving oxytocin and epidural analgesia early and late in labor³ and 10% and 8% for nulliparous women in spontaneous labor given epidural analgesia early and late in labor.⁴ Similar to the local anesthetic regimen used by Thorp *et al.*, Chestnut *et al.* injected 0.25% bupivacaine followed by bupivacaine infusion of 0.125% and no opioid.^{3,4}

The overall incidence of cesarean section at our hospital, where 3,000 deliveries per year occur, had been 10%, with epidural treatment limited to some patients with hypertensive disorders of pregnancy. Since 1993, the introduction of routinely available epidural analgesia into general use for labor, as "early" as possible for each patient, the historical overall cesarean section rate at our hospital has increased to 12%, a *preliminary* change of statistical significance by chi-square analysis (fig. 1). This is less than any other major obstetrics center in Missouri; this is clinically acceptable. Our loading and maintenance doses of bupivacaine are 0.125% combined with epidural opioid, often butorphanol or fentanyl.

That Thorp *et al.*'s 45 nulliparous patients receiving intravenous meperidine and promethazine had but one cesarean section (2.2%) is impressive.¹ A specific comparison of the "best" dilute amide plus opioid labor epidural remains unavailable. Nevertheless, we are not

ready to refrain from offering epidural analgesia to nulliparous women in labor, with and without oxytocin augmentation.

Daniel B. Gould, M.D.
Department of Anesthesiology
St. Louis Regional Medical Center
5535 Delmar Boulevard
St. Louis, Missouri 63112

References

1. Thorp JA, Hu DH, Albin RM, McNitt J, Meyer BA, Cohen GR, Yeast JD: The effects of intrapartum epidural analgesia in nulliparous labor: A randomized, controlled, prospective trial. *Am J Obstet Gynecol* 169:851–858, 1993
2. Naulty JS, March MG, Leavitt KL, Smith R, Urso PR: Effects of changes in labor analgesia on practice outcome (abstract). *ANESTHESIOLOGY* 77:A979, 1992
3. Chestnut DH, Vincent RD Jr, McGrath JM, Choi WW, Bates JN: Does early administration of epidural analgesia affect obstetric outcome in nulliparous women who are receiving intravenous oxytocin? *ANESTHESIOLOGY* 80:1193–1200, 1994
4. Chestnut DH, McGrath JM, Vincent RD, Penning DH, Choi WW, Bates JN, McFarlane C: Does early administration of epidural analgesia affect obstetric outcome in nulliparous women who are in spontaneous labor? *ANESTHESIOLOGY* 80:1201–1208, 1994

(Accepted for publication October 4, 1994.)

Anesthesiology
82:312–313, 1995
© 1995 American Society of Anesthesiologists, Inc.
J. B. Lippincott Company, Philadelphia

In Reply:—I appreciate Gould's interest in our two studies.^{1,2} Using the "catastrophe theory," Gould observed that a substantial increase in the use of epidural analgesia was associated with a slight increase in the cesarean section rate in his hospital. Others have used similar methodology to demonstrate that the introduction of an epidural analgesia service did not result in an increased cesarean section rate in their hospital.^{3–6} Likewise, others have observed that good obstetric management (e.g., active management of labor, peer review of cesarean section rates for individual physicians, trial of labor after previous cesarean section) results in a *decreased* cesarean section rate, despite the *increased* utilization of epidural analgesia.^{4–6}

Gould did not acknowledge that our technique for epidural analgesia was identical to that used by Thorp *et al.*⁷ Nonetheless, the cesarean section rate for patients in spontaneous labor in our study² was substantially less than the cesarean section rate for similar women who received epidural analgesia in the study performed by Thorp *et al.*⁷

I agree with Gould that epidural analgesia is not a generic procedure. It is possible that, under certain circumstances, epidural

analgesia may increase the risk for cesarean section in selected patients. The study by Thorp *et al.*⁷ was limited by several factors. First, the authors enrolled a small number of patients. How many times did they "peek" at their data during the performance of the study? Second, Thorp *et al.*⁷ included indigent patients only. Given the strength of Thorp's convictions regarding the effect of epidural analgesia on the cesarean section rate, it is curious that he and his colleagues did not enroll private patients in their study. Third, Thorp *et al.*⁷ did not clearly identify the method of randomization. Specifically, it is unclear that the sealed envelopes were sequentially numbered. Fourth, the authors of the study—who obviously were not blinded to the group assignment—assumed responsibility for decisions regarding the method of delivery.

Anesthesiologists should carefully evaluate the potential effects of epidural analgesia on the progress of labor and method of delivery. We should identify those techniques that provide the most effective analgesia with the least adverse effect on the progress of labor and method of delivery. Unfortunately, Thorp *et al.*⁷ have substantially overestimated the potential contribution of epidural analgesia to the "cesarean section epidemic."⁸ As a result, they have performed a disservice to current and future pregnant women. Their results do not reflect outcome at a variety of other medical centers in the United States and abroad. Thorp *et al.*⁷ have caused some women to experience an inordinate fear of epidural analgesia. Further, their study may encourage third-party payers to deny reimbursement for labor analgesia, in the absence of a so-called "medical indication."

* Larson DD: The effect of initiating an obstetric anesthesiology service on rate of cesarean section and rate of forceps delivery (abstract). Proceedings of the Annual Meeting of the Society for Obstetric Anesthesia and Perinatology, 1992.

Let us not forget the joint statement of the American Society of Anesthesiologists and the American College of Obstetricians and Gynecologists:

There is no other circumstance where it is considered acceptable for a person to experience severe pain, amenable to safe intervention, while under a physician's care. Maternal request is a sufficient justification for pain relief during labor.

David H. Chestnut, M.D.

Alfred Habeeb Professor and Chairman of Anesthesiology
Professor of Obstetrics and Gynecology
University of Alabama at Birmingham School of Medicine
619 South 19th Street
Birmingham, Alabama 35233-6810

References

1. Chestnut DH, Vincent RD Jr, McGrath JM, Choi WW, Bates JN: Does early administration of epidural analgesia affect obstetric outcome in nulliparous women who are receiving intravenous oxytocin? *ANESTHESIOLOGY* 80:1193-1200, 1994

2. Chestnut DH, McGrath JM, Vincent RD, Penning DH, Choi WW, Bates JN, McFarlane C: Does early administration of epidural analgesia affect obstetric outcome in nulliparous women who are in spontaneous labor? *ANESTHESIOLOGY* 80:1201-1208, 1994

3. Gribble RK, Meier PR: Effect of epidural analgesia on the primary cesarean rate. *Obstet Gynecol* 78:231-234, 1991

4. Iglesias S, Burn R, Saunders LD: Reducing the cesarean rate in a rural community hospital. *Can Med Assoc J* 145:1459-1464, 1991

5. Socol ML, Garcia PM, Peaceman AM, Dooley SL: Reducing cesarean births at a primarily private university hospital. *Am J Obstet Gynecol* 168:1748-1758, 1993

6. Robson M, Boylan P, McParland P, McQuillan C, O'Neill M: Epidural analgesia need not influence the spontaneous vaginal delivery rate (abstract). *Am J Obstet Gynecol* 168:364, 1993

7. Thorp JA, Hu DH, Albin RM, McNitt J, Meyer BA, Cohen GR, Yeast JB: The effects of intrapartum epidural analgesia in nulliparous labor: A randomized, controlled, prospective trial. *Am J Obstet Gynecol* 169:851-858, 1993

8. Thorp JA: Obstetricians and epidural analgesia (letter). *Am J Obstet Gynecol* 170:1837-1838, 1994

(Accepted for publication October 4, 1994.)

Anesthesiology

82:313-314, 1995

© 1995 American Society of Anesthesiologists, Inc.

J. B. Lippincott Company, Philadelphia

Desflurane Can Be Used to Achieve Smooth and Rapid Induction of Anesthesia

To the Editor:—Inhalation induction of anesthesia commonly is employed in the younger child and, with practice, the technique is quick, smooth, and minimally traumatic psychologically. In the adult population, it may be used as an alternative when there is danger of losing airway control with intravenous induction. In the adult, however, induction time may be prolonged and associated with coughing, straining, or laryngospasm, particularly in the patient with "irritable airways" due to smoking, chronic respiratory infection, or other causes.

For inhalation induction, halothane is considered the agent of choice, because it is less of an airway irritant than the other available agents.¹ Desflurane, because its blood-gas partition coefficient is less than one-fifth that of halothane, has the theoretical advantage of a very short induction time. Unfortunately, because it is also a potent airway irritant, it leads to an unpleasant induction associated with breath-holding, coughing, increased secretions, and laryngospasm.^{2,3}

We recently were requested to provide anesthesia to a 62-yr-old man with a class IV airway compounded by stridor caused by granulation tissue growth in the sub- and supraglottic regions. He had undergone radiation treatment to his neck for a laryngeal tumor with consequent fibrotic limitation of neck extension and a recent resection of 3.5 cm of his trachea just distal to the cricoid cartilage. He also had a history of sleep apnea.

Because of the uncertainty of visualizing the glottis, we planned to have the surgeon perform direct laryngoscopy with the patient

awake and on successful identification of the larynx and suspension of the scope to induce general anesthesia intravenously. The surgeon then planned carbon dioxide laser resection of the lesions during jet ventilation without an endotracheal tube.

We elected to sedate the patient and topically anesthetize his upper airway in preparation for laryngoscopy. We accomplished this by giving 0.2 mg glycopyrrolate as an antisialagogue and had the patient breathe nebulized 4% lidocaine followed by a dense 4% lidocaine mist delivered by flowing oxygen at 6 l/min through an atomizer, which was activated on inspiration by occluding a hole precut in the oxygen delivery tube. However, because of increased sensitivity to sedative medications, often associated with sleep apnea, the patient became somnolent and combative after 100 µg fentanyl and 2 mg midazolam administered intravenously over 10 min. We, therefore, had to change anesthetic technique. Because with the aid of forward jaw thrust, unobstructed spontaneous respirations were obtained, we switched to inhalation induction with desflurane, reasoning that it would be quick and safe, because his airway should be protected from irritation by the lidocaine anesthesia. Induction was smooth, and adequate anesthesia for surgical laryngoscopy was rapidly achieved. Jet ventilation was successfully commenced, and muscle relaxation was added.

We have since used desflurane to induce anesthesia rapidly and smoothly after topically anesthetizing the airway in three additional patients with pathology somewhat similar to the one described. By