

Beneficial Impact of Epidural Anesthesia on Recovery After Outpatient Arthroscopy

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Summary: The ideal outpatient anesthetic provides analgesia, is readily reversible, has minimal complications, and allows for a prompt hospital discharge. Iatrogenic side effects, such as nausea/vomiting and pain, however, may hamper patient recovery and delay discharge. The influence of anesthesia [general (G) versus epidural (E)] was assessed in 260 patients (G = 181, E = 79) undergoing ambulatory knee arthroscopic surgery. Patients were studied before discharge and on follow-up (24 h) to evaluate the effect of the anesthetic technique. Discharge times were shorter in the E group (159 ± 6 min SEM E, compared with 208 ± 8 min SEM G), as was the incidence of pain (24.1% versus 49.7%), and nausea/vomiting (8.9% versus 32%) before discharge. Patient satisfaction was equal in the two groups. Our study shows that in select patients, epidural anesthesia is a viable alternative to general anesthesia for knee arthroscopy, offering the advantages of fewer side effects and earlier discharge times. **Key Words:** General anesthesia—Epidural anesthesia—Outpatient surgery—Side effects—Discharge times.

The major goals of outpatient anesthesia are the administering of a safe anesthetic with minimal side effects coupled with a timely hospital discharge. However, after anesthesia in ambulatory patients, such complications as somnolence, pain, and nausea/vomiting may hamper recovery, resulting in unscheduled hospital admission, a prolonged stay, and decreased patient satisfaction. Because of the high

incidence of these side effects, general anesthesia has been documented to be the primary factor associated with unexpected hospital admission after outpatient surgery (1).

Regional anesthesia has been advocated for ambulatory surgery patients because it is less likely to produce iatrogenic complications that can prolong hospital stay (2,3). Epidural anesthesia, in particular, is well suited for lower extremity procedures, such as knee arthroscopies, where surgical anesthesia and postoperative analgesia can be achieved through low-level blocks. When combined with light levels of sedation, this technique allows patients to participate in the surgery by viewing the procedure on a monitor, if they are so inclined. However, there have been few studies comparing regional anesthesia with general anesthesia in the outpatient setting (3-6). In addition, none have prospectively evaluated discharge times, incidences of postoperative side effects, or patient acceptance.

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This article reports the results of an experimental investigation of human subjects. The project was approved by the Human Investigation Committee. The work was presented in part by Bernard R. Bach, Jr., M.D., at the 1991 Arthroscopy Association of North America Meeting in San Diego, California, and by Samuel M. Parnass, M.D., at the 1990 American Society of Anesthesiologists' meeting in Las Vegas, Nevada.

This study was designed to evaluate prospectively general and regional anesthesia in patients scheduled for ambulatory knee arthroscopy by comparing discharge times, incidences of side effects, and overall patient satisfaction.

MATERIALS AND METHODS

With approval from the institutional review board, 260 consecutive ambulatory surgery patients scheduled for knee arthroscopy over a 24-month period were prospectively evaluated. Patients received either epidural or general anesthesia, at the discretion of the anesthesia team (unrelated to the study) after consultation with patients. General anesthesia was induced with thiopental and succinylcholine and maintained with isoflurane and nitrous oxide in oxygen with narcotic supplementation. Data regarding anesthetic technique and drug use was collected intraoperatively. After transfer to the Post Anesthesia Care Unit (PACU), data collection was continued by the PACU nurse. The presence of nausea/vomiting, pain, itching, and urinary retention was recorded, as was any treatment required for these symptoms. The amount of time spent in the PACU was documented, and patients were then transferred to the second-stage Outpatient Recovery Room (OPRR), where the OPRR nurse recorded further information. The same parameters were evaluated, and a linear analogue pain score and responses to questions regarding the incidence of sore throat, muscle aches, back pain, and headache were also recorded. The discharge time from the OPRR was noted.

On the first postoperative day, the OPRR nurses called patients as an extension of routine postoperative follow-up. The questions previously asked in the OPRR were repeated, and new information was elicited regarding dizziness, the amount of pain medication needed, and whether pain was greater than expected. Patients were also asked to rate their ability to walk and the quality of their overall anesthetic experience, each on a scale of 1 to 10. Moreover, they were asked if they would request the same anesthetic should they require similar surgery in the future.

Age, height, weight, and discharge times were compared using a Student's *t* test. Ambulation, morphine equivalence, and satisfaction ratings were evaluated with the Mann-Whitney U-test. All other

data were analyzed using χ^2 . Significance was set at $p \leq 0.05$.

RESULTS

Two hundred sixty consecutive patients undergoing knee arthroscopies were prospectively evaluated: 181 underwent general anesthesia, and 79 received epidural anesthesia. The groups were comparable in height, weight, gender, and length of surgery; however, on average, those receiving epidural anesthesia were older than those receiving general anesthesia (Table 1). Lidocaine was used in 86% of the epidural cases, while the remainder were evenly divided among mepivacaine, 2-chloroprocaine, and bupivacaine. The range of fentanyl used for i.v. supplementation in the epidural group was between 50 and 450 μg , with an average of $119.64 \pm 9.77 \mu\text{g}$. When midazolam was used for i.v. supplementation, the dose ranged between 1 mg and 14 mg, with an average of $4.26 \pm 0.35 \text{ mg}$.

The number of cases lost to follow-up ($n = 50$, 19.2%) was evenly distributed between groups: 15 from the epidural group (19.0%) and 35 from the general group (19.3%). An equal number of patients in each group received an intraarticular bupivacaine instillation. Two patients were admitted to the hospital for more extensive surgery (one from each group) and were subsequently excluded from follow-up analyses.

The incidence of side effects and discharge times from the PACU and OPRR are shown in Table 2. Patients who received epidural anesthesia were discharged earlier from both the PACU and OPRR, with a total discharge time of $159 \pm 6 \text{ min}$ in the epidural group versus $208 \pm 8 \text{ min}$ in the general group. In the PACU, there was a lower incidence of pain and nausea/vomiting in the epidural group, and fewer patients required analgesic treatment. This

TABLE 1. Demographic data

| Variables | Type of anesthesia | | p value |
|--------------------------------------|------------------------|------------------------|---------|
| | Epidural | General | |
| Number of patients | 79 | 181 | |
| Height (inches) ^a | 69 ± 0.6 | 69 ± 0.4 | 0.63 |
| Weight (kg) ^a | 79 ± 2.2 | 69 ± 0.6 | 0.92 |
| Gender | Male 65% Female 35% | Male 65% Female 35% | 0.94 |
| Age (years) | 37.9 ± 1.4 | 33.2 ± 1.1 | 0.01 |
| Length of surgery (min) ^a | 73.6 ± 4.14 | 74.3 ± 2.79 | 0.89 |
| Intraarticular bupivacaine | 63.3% | 64.1% | 0.91 |

^a Data reported as mean \pm SEM.

