

**Salviz EA, Xu D, et al. Continuous Interscalene Block in Patients Having Outpatient Rotator Cuff Repair Surgery: A Prospective Randomized Trial.** Anesth Analg 2013;117:1485–92.

Design: Randomized clinical trial

Study Question: In patients undergoing arthroscopic rotator cuff repair, is there a difference in postoperative pain between anesthesia with continuous interscalene block (CISB), single injection interscalene block (SISB), and general anesthesia (GA)?

Population/sample size/setting:

- 63 patients (22 men, 41 women, mean age 55) who had elective arthroscopic repair of the supraspinatus tendon at Columbia University in New York City
  - o The original enrollment cohort was 71 patients
- Eligibility criteria were age at least 18, ASA physical status I to III (healthy, mild systemic disease, or severe disease, but not “severe systemic disease which is a constant threat to life”), and BMI $\leq$ 35
- Exclusion criteria were open shoulder procedures, difficulty understanding the instructions for the anesthesia pump, allergy to local anesthesia, significant neurologic, psychiatric, or cognitive disorders, and chronic opioid use

Main outcome measures:

- All patients were premedicated with IV midazolam 2 mg and fentanyl 50 mcg
- All patients received 1000 mg acetaminophen intraoperatively
- Randomization was into one of three groups: continuous interscalene block (CISB, n=20), single injection interscalene block (SISB, n=23), and general anesthesia (GA, n=20)
  - o For SISB and for CISB, the placement of the local anesthesia was done with both ultrasound and nerve stimulation to ensure placement between the upper and middle trunks of the brachial plexus
  - o SISB group had 20 ml of 0.5% ropivacaine injected through a 5 cm 22-gauge insulated block needle
  - o CISB group had placement of a 5 cm 18 gauge needle over which a non-stimulating catheter was advanced and the needle was withdrawn, and they also were given 20 ml of 0.5% ropivacaine; then the catheter was secured and covered with sterile tape
    - After surgery was complete, the CISB group had a continuous infusion of 0.2% ropivacaine 5 ml/hr with patient-controlled boluses of 5 ml with a 60 minute lockout period

- The interscalene catheters were removed at the ambulatory surgery site 48 hours after surgery (the usual procedure is to have the patient remove the catheter at home)
  - The GA group had induction of anesthesia with propofol, fentanyl, and rocuronium and ventilation with 100% oxygen at a flow rate of 8 liters/min
- The primary outcome was defined in terms of pain on postoperative day 7, where group differences in the pain numerical rating scale (NRS) were recorded
  - Both the NRS and the proportion of patients with NRS<4 were compared between groups
  - The study data were collected by research fellows blinded to group allocation, and were collected at the hospital until discharge home and then by telephone through the entire postoperative week on days 1, 2, 3, and 7
  - The CISB group also had data recorded for the first 48 hours
- On postoperative day 7, the CISB group had significantly more patients with NRS less than 4 (74%), compared to 17% in the SISB group and 42% in the GA group; NRS between 4 and 7 was reported by 21% of the CISB group, 70% of the SISB group, and 37% of the GA group
- On the first two postoperative days, the use of narcotics was lower among the CISB patients than among the SISB or the GA patients, as defined by the percentage taking at least one dose of analgesia
  - On day 1 the use of narcotic analgesia was reported by 60% of the CISB group, 96% of the SISB group, and by 90% of the GA group
  - On day 2 the use of narcotic analgesia was reported by 65% of the CISB group, 91% of the SISB group, and by 95% of the GA group
  - On day 3 the use of narcotic analgesia was reported by 85% of the CISB group, 91% of the SISB group, and by 95% of the GA group
  - On day 7 the use of narcotic analgesia was reported by 63% of the CISB group, 70% of the SISB group, and by 72% of the GA group
- Both the SISB and CISB groups were able to bypass the postoperative anesthesia care unit (PACU) compared to the GA group (1 CISB patient, 3 SISB patients, and all 20 GA patients spent time in the PACU)
  - Similarly, the ISB patients were discharged home faster than the GA patients: a mean of 94 min for CISB, 115 min for SISB, and 302 min for GA
- No lasting complications occurred in any of the treatment groups; most infusion pumps had 20 to 60 ml of residual anesthetic at the time of catheter removal

Authors' conclusions:

- Both CISB and SISB result in significantly faster discharge home and greater postoperative analgesia compared to GA
- CISB results in sustained analgesic benefit through the first week compared to SISB

Comments:

- The comparison of CISB to SISB and GA during the first 48 hours was not done in the same way; the CISB group had its data tracked during that time, and paid a visit to the ambulatory surgery department at the end of 48 hours; the SISB and GA groups were followed by telephone only, creating a risk of bias for data collected and comparisons made in the first 48 hours
  - o The comparisons with respect to narcotic use are therefore susceptible to a degree of bias from the CISB group having more contact with the health care staff than the other groups
  - o The narcotic use after 48 hours is not different between the three groups; most patients are still using some narcotics at the 7 day evaluation
- There was a departure from usual practice in having the CISB group attend the ambulatory surgery department for removal of the catheter, which is usually removed at home; this makes the external validity of the study questionable
- The comparison of ISB to GA was done in the hospital and the time to discharge could have been influenced by staff knowledge of the type of anesthesia given, but the decision to discharge home is not likely to have been greatly biased thereby, and it is to be expected that general anesthesia takes longer to recover from than regional anesthesia
- There is a small anomaly in Table 2, where 19 of 20 CISB patients bypassed the PACU, meaning that one CISB patient spent time in the PACU
  - o The time in the PACU is 20 minutes with a standard deviation of 31 minutes; with a single observation, there should be no standard deviation at all
- The greater proportion of CISB patients with low pain scores at 7 days is less susceptible to risk than the observations in the first 48 hours, but the rate of narcotic use at that time is very similar to that for SISB and for GA

Assessment: adequate for some evidence that interscalene regional anesthesia at the time of elective arthroscopic rotator cuff repair results in faster hospital discharge than general anesthesia. Adequate for some evidence that continuous ISB for 48 hours is associated with somewhat greater pain relief at the seventh postoperative day than single injection ISB, but there is little if any difference in the use of narcotics at that time between continuous and single injection anesthesia