

INTERSCALENE BLOCK AND OTHER ARTICLES ON ANESTHESIA FOR ARTHROSCOPIC SURGERY NOT QUALIFYING AS EVIDENCE

Hughes MS, Matava MJ, et al. Interscalene Brachial Plexus Block for Arthroscopic Shoulder Surgery. A Systematic Review. JBJS Am 2013;95:1318-24.

Design: Systematic review of controlled clinical trials of interscalene brachial plexus block (ISBPB) for arthroscopic shoulder surgery

Reason not to cite as evidence: Although the review summarizes the results of 10 studies of ISBPB in the setting of arthroscopic shoulder surgery, the studies were too diverse to allow more than a narrative review of results of the studies. In addition, studies comparing single-shot ISBPB with continuous infusion pumps were excluded from the review, and this comparison is of special importance for the shoulder guideline.

Ullah H, Samad K, Khan FA. Continuous interscalene brachial plexus block versus parenteral analgesia for postoperative pain relief after major shoulder surgery (Review). Cochrane Database of Systematic Reviews 2014, Issue 2. Art. No.: CD007080

Design: Systematic review of randomized clinical trials comparing ISBPB with parenteral analgesia for open (non-arthroscopic) shoulder surgery

Reason not to cite as evidence: only two trials met inclusion criteria, and these trials were not of sufficient quality to allow the authors to draw reasonable conclusions about ISBPB compared to parenteral analgesia for major shoulder surgery

Ciccone WJ, Busey TD, et al. Assessment of Pain Relief Provided by Interscalene Regional Block and Infusion Pump After Arthroscopic Shoulder Surgery. Arthroscopy 2008;24(1):14-19

Design: randomized clinical trial

Brief summary of findings:

- 92 patients randomized to 4 treatment groups, but only 76 completed the study
- All had arthroscopic procedures for subacromial decompression and possible rotator cuff repair, all done under general anesthesia
- 76 patients randomized to postoperative analgesia with 30 ml ropivacaine delivered by ISBPB only (n=20), disposable balloon infusion pump with a 48 hour supply of 0.5% bupivacaine only (n=19), ISBPB plus bupivacaine pump (n=19), and ISBPB plus saline solution pump (n=18)
- Postoperative VAS scores were similar for all four groups except at 1 and 2 hours postoperatively

- VAS scores for the bupivacaine pump at 1 and 2 hours were greater than for the other three groups
- VAS scores at 1 hour were also worse for the ISBPB group than for the group with ISBPB plus saline pump
- Medication use in the recovery room was greater with the bupivacaine pump only than for the ISBPB groups
 - In the bupivacaine pump only group, 13 patients took fentanyl and 15 took oral narcotics
 - In the ISBPB only group, 1 took fentanyl and 3 took oral narcotics
 - In the ISBPB plus bupivacaine pump group, 2 took fentanyl and 2 took oral narcotics
 - In the ISBPB plus saline pump group, none took fentanyl and 3 took oral narcotics

Reasons not to cite as evidence:

- The reporting of the VAS scores is presented in tabular form only, without a tabular display of data, and ANOVA is used for comparing groups
 - ANOVA reports p values without effect sizes, making it of little value in estimating how effective different interventions are in comparison to one another
- There is a Table 3, which shows no group differences in oral narcotics over the 7 days of observation; however, the units are not reported (but could be milligrams of unspecified drugs)

Frederickson MJ, Ball CM, Dalglish AJ, Analgesic Effectiveness of a Continuous Versus Single-Injection Interscalene Block for Minor Arthroscopic Shoulder Surgery. Reg Anesth Pain Med 2010;35:28-33

Design: randomized clinical trial

Brief summary of results:

- 61 patients undergoing arthroscopic shoulder surgery (subacromial decompression, labral repair, or lateral clavicle excision) were randomized in the operating room to single-shot ISBPB with ropivacaine (n=30) or to a continuous infusion pump lasting 48 hours with ropivacaine (n=31)
- Numerical pain scores were lower on day 1 in the continuous group, and tramadol use was lower in the continuous group on both days in the continuous group
- One patient in the single shot group required 2 nights of hospitalization and intravenous opioid for severe pain
- Patient satisfaction was equal in the single shot and continuous infusion groups

Reason not to cite as evidence:

- Although well-planned and executed in several ways, the pain data is not reported in tabular form (box and whisker graphs are used instead), making the effect size estimate not very clear
- The use of tramadol is a pertinent outcome, but is not reported after 2 days, even though the patients were contacted through day 10

- However, the study does contribute to the discussion of single-shot versus continuous anesthetic infusion
 - o The authors point out that patients with a low pain threshold may have declined to participate in the study because of a preference for a continuous infusion; this could lead to an underestimation of the effectiveness of the continuous infusion
 - o They note that the continuous infusion option may entail considerable need for patient education in how to manage and later remove the device, and that this may have an effect of reducing patient overall satisfaction
 - o They also make a reasonable suggestion that patients who have previously experienced prolonged postoperative pain, or patients who are anxious, could be considered for the continuous infusion as part of an individualized approach to postoperative analgesia

Oh JH, Rhee K-Y, et al. Comparison of Analgesic Efficacy between Single Interscalene Block Combined with a Continuous Intra-bursal Infusion of Ropivacaine and Continuous Interscalene Block after Arthroscopic Rotator Cuff Repair. Clinics in Orthopedic Surgery 2009;1:48-53.

Design: Randomized clinical trial

Brief summary of results:

- 58 patients undergoing unilateral arthroscopic rotator cuff repair were randomized to continuous interscalene block with ropivacaine (CISB, n=32) or to a single shot interscalene block accompanied by a continuous intralesional (intra-bursal) ropivacaine infusion with the catheter introduced through one of the arthroscopic portals at the end of surgery ((ISB-IB, n=26); each intervention lasted 48 hours
- The level of postoperative VAS pain was similar in the two groups, except at 1 hour after surgery, when the CISB group experienced greater pain than the ISB-IB group
- The ISB-IB group had fewer complications in the 48 hours of the study
 - o Catheters came out accidentally in 7 of the CISB patients but in only 1 of the ISB-IB group
 - o Half of the CISB group complained of motor weakness in the upper extremities during the infusion, and 10 CISB patients complained of sensory disturbance for more than 2 hours after completing the infusion; one patient had ptosis and 2 experienced nausea
 - o However, there were no remarkable complications in the ISB-IB group

Reasons not to cite as evidence:

- As with other studies, VAS pain scores are presented without numerical data and without standard deviations
- The 1-hour VAS score difference may not be a characteristic of the CISB intervention itself, and may have been prevented if a slightly larger dose of ropivacaine had been given when the block was done
- The difference in reported complication rates is of clinical relevance, but it is simply stated that “there were no remarkable complications” in the ISB-IB group; actual data are not given

- The lack of blinding could account for some of the differences in rates at which the groups complained of postoperative symptoms
- However, there is a plausible biological mechanism for the intra-lesional infusion to have fewer neurological complications than the brachial plexus infusion, and a single occurrence of ptosis in the CISB group is consistent with the known risks of ISBPB

Webb D, Guttman D, et al. Continuous Infusion of a Local Anesthetic Versus Interscalene Block for Postoperative Pain Control After Arthroscopic Shoulder Surgery. *Arthroscopy* 2007;23(9):1006-1011.

Design: randomized clinical trial

Brief summary of results:

- 56 patients undergoing arthroscopic surgery for rotator cuff repair, glenohumeral debridement, subacromial decompression, and other indications were randomized to a single shot ISBPB with bupivacaine (n=29) or 48 hour continuous infusion with bupivacaine delivered by a patient-controlled pump which was removed by the patient
- For VAS pain, no statistically significant differences in scores were identified over the 7 days of evaluation; the pain pump group had better VAS scores in the first 4 days, but this was not statistically significant
- No differences were identified in either ibuprofen or Percocet use over the 7 days of evaluation
- No complications were reported over the 7 days of observation
- Costs were equal between the two groups, and Workers' Compensation patients did as well as non-WC patients on both cost and pain

Reasons not to cite as evidence:

- As with other studies, there is graphic but not tabular display of pain scores
 - o Figure 1 does make it appear that the single shot group had considerably more pain on day 3 with a sudden spike which disappeared on day 4; this may be only an oddity, but was not discussed by the authors
 - o However, the study does make a contribution to the discussion of single shot versus continuous infusion for postoperative analgesia
 - The use of Percocet, while reported only graphically, does appear to be very similar between groups, and displays data out to 7 days rather than only 2 days as with Frederickson et al 2010
 - Postoperative opioid use is an outcome of special importance, and the data from this study stand in contrast to Frederickson but is similar to what was reported by Ciccone et al 2008
 - o Evidence regarding opioid use with single shot versus continuous infusion must be seen as very uncertain

Additional references:

Solomon DJ, Navaie M, et al. Glenohumeral Chondrolysis After Arthroscopy: A Systematic Review of Potential Contributors and Causal Pathways. *Arthroscopy* 2009;25:1329-1342.

Busfield BT, Romero DM . Pain Pump Use After Shoulder Arthroscopy As a Cause of Glenohumeral Chondrolysis. *Arthroscopy* 2009;25:647-652.

Bailie DS, Ellenbecker TS Severe chondrolysis after shoulder arthroscopy: A case series. *J Shoulder Elbow Surg* 2009; 18: 742-747

Winkler T, Suda AJ, et al. Interscalene versus subacromial continuous infusion of ropivacaine after arthroscopic acromioplasty: A randomized controlled trial. *J Shoulder Elbow Surg* 2009;18;566-572.

Design: Randomized clinical trial

Brief summary of results:

- 40 patients (20 men, 20 women, mean age 53) undergoing arthroscopic acromioplasty for shoulder tendinosis (rotator cuff tears excluded) were randomized to one of two treatments for control of postoperative pain: interscalene (IS) anesthesia through an interscalene catheter placed at the end of surgery, and subacromial (SA) anesthesia through a catheter in the subacromial space at the end of surgery
- Pain VAS scores trended lower for the first 43 hours after surgery in the IS group for both rest and exercise pain, and significantly so at 8 and 12 hours after catheter placement
- Use of additional analgesics during the first 43 hours did not significantly differ between groups

Reasons not to cite as evidence:

- As is common to many other studies of the same subject, pain scores are only presented graphically and differences are reported in terms of p values rather than effect sizes with confidence intervals
- While VAS scores in the first 48 hours after surgery are appropriate outcomes to be concerned about, their reporting alone in an unblinded study does not allow for a clear evidence statement in favor of IS over SA anesthesia at the time of acromioplasty
- The findings of Oh et al 2009 (above) appeared to favor the subacromial (intrabursal) infusion over the interscalene infusion; Oh was studying patients with rotator cuff repairs and not of acromioplasty for rotator cuff tendinosis; the findings do not conflict with one another, but a consistent statement of which form of anesthesia is most effective would be very difficult to justify, and the choices of the surgeon and anesthesiologist may be left open

Overview of above information:

There does not appear to be sufficient high-quality evidence to make an evidence statement concerning the effectiveness of different interventions for postoperative analgesia after either open or arthroscopic shoulder surgery. However, there does not appear to be evidence favoring a 48 hour continuous interscalene block over a single injection block for arthroscopic surgery. In addition, although a continuous infusion does require an investment of time in patient education when outpatient shoulder surgery is done. In addition, Oh 2009, while not warranting an evidence statement, does warrant an information statement that the subacromial infusion of anesthetic into the operated area is reported to result in fewer inadvertent removals of the catheter, and infusion of anesthetic away from the region of the brachial plexus may avoid neurological complications arising from the intervention.