Published in final edited form as:

Reg Anesth Pain Med. 2013 March ; 38(2): 171–172. doi:10.1097/AAP.0b013e318283475b.

Continuous Interscalene Nerve Block following Adhesive Capsulitis Manipulation

Nisha Malhotra, MD [Assistant Clinical Professor of Anesthesiology], Sarah J. Madison, MD [Assistant Clinical Professor of Anesthesiology], Samuel R. Ward, PT, PhD [Associate Professor of Radiology, Orthopedic Surgery, and Bioengineering], Edward R. Mariano, MD [Associate Clinical Professor of Anesthesiology], Vanessa J. Loland, MD [Assistant Clinical Professor of Anesthesiology], and Brian M. Ilfeld, MD, MS [Professor of Anesthesiology]

Department of Anesthesiology, University of California, San Diego, San Diego, California

To the Editor: We report on a prospective series of patients who were treated with a 3-day ambulatory perineural local anesthetic infusion in addition to the customary single-injection brachial plexus block for shoulder manipulation, using specific prospectively-defined endpoints. Shoulder adhesive capsulitis may be treated with manipulation under anesthesia to physically break up scar tissue associated with the joint capsule. After manipulation, frequent intensive range-of-motion exercises are critical to prevent recurrence of pathology.^{1,2} Unfortunately, shoulder motion following manipulation is often painful, greatly limiting adherence to the exercise regimen and resulting in a return of capsular adhesions.³ While treating shoulder pain with continuous interscalene nerve blocks has been studied previously following invasive surgical procedures in the immediate postoperative period,⁴ their application in non-surgical patients—and any longer-term, post-infusion effects on range-of-motion—remain uninvestigated.

Methods

Following IRB (University California San Diego, San Diego, California) approval and written informed consent, baseline range-of-motion measurements were recorded in subjects undergoing shoulder manipulation for refractory adhesive capsulitis. Subsequently, interscalene perineural catheters were inserted, and mepivacaine 1.5% (40 mL) with epinephrine 2.5 µg/mL was injected *via* the catheters.⁵ Following the manipulation, subjects were randomized to receive an infusion of perineural ropivacaine 0.2% or normal saline in a double-masked fashion (basal 8 mL/h, bolus 4 mL, lockout 30 min, reservoir volume 1000 mL). The infusions were provided at home, using an electronic portable infusion pump (ambIT PCA, Summit Medical, Salt Lake City, Utah) for 3 days. Prospectively defined endpoints included pain, opioid use, and shoulder abduction range-of-motion immediately after and the day following manipulation, as well as at 6 and 12 weeks. The study was originally powered for 30 subjects (clinicaltrials.gov NCT00875862). However, enrollment ceased prematurely after the sole surgeon performing these procedures left our medical center, and not all endpoints (eg, pain scores at 6 and 12 weeks) were collected from subjects or reported in this report.

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Results

All subjects (n=4) had a successful catheter insertion and single-injection interscalene block. Pain, opioid use, and awakenings due to pain were lower/less in the ropivacaine group (Table 1) while abduction was improved (Fig. 1).

Conclusions

In this pilot study, a 3-day ambulatory continuous interscalene nerve block appeared to improve both short- and long-term outcomes following shoulder manipulation for refractory adhesive capsulitis. If these results are confirmed in a large randomized, controlled trial, it will be one of only a few examples in which a continuous peripheral nerve block results in post-infusion benefits for a non-surgical patient population.

Acknowledgments

Financial Support: National Institutes of Health (Bethesda, MD) grants GM077026 (P.I.: Dr. Ilfeld) from the National Institute of General Medical Sciences, HD050837 (P.I.: Lieber; sub-award P.I.: Dr. Ilfeld) from the National Institute of Child Health and Human Development *via* the National Skeletal Muscle Research Center; the Department of Anesthesiology at the University of California, San Diego (San Diego, California); and an unrestricted research grant from Summit Medical (Salt Lake City, Utah). The contents of this letter are solely the responsibility of the authors and do not necessarily represent the official views of these entities.

REFERENCES

1. Brue S, Valentin A, Forssblad M, Werner S, Mikkelsen C, Cerulli G. Idiopathic adhesive capsulitis of the shoulder: a review. *Knee Surg Sports Traumatol Arthrosc.* 2007; 15:1048–1054. [PubMed: 17333122]
2. Murnaghan JP. Adhesive capsulitis of the shoulder: current concepts and treatment. *Orthopedics.* 1988; 11:153–158. [PubMed: 3281152]
3. Yamaguchi K, Sethi N, Bauer GS. Postoperative pain control following arthroscopic release of adhesive capsulitis: a short-term retrospective review study of the use of an intra-articular pain catheter. *Arthroscopy.* 2002; 18:359–365. [PubMed: 11951193]
4. Ilfeld BM. Continuous peripheral nerve blocks: A review of the published evidence. *Anesth Analg.* 2011; 113:904–925. [PubMed: 21821511]
5. Mariano E, Loland V, Ilfeld B. Interscalene perineural catheter placement using an ultrasound-guided posterior approach. *Reg Anesth Pain Med.* 2009; 34:60–63. [PubMed: 19258989]

Figure 1.

Passive glenohumeral abduction expressed as a percent change of pre-manipulation value (observed / baseline). Negative values represent a loss in range of motion.

Table 1

Average pain (Numeric Rating Scale: 0–10), oral opioid use (oxycodone), and number of awakenings due to pain.

Average Pain at Rest	Ropivacaine	Placebo
Evening of Manipulation	0.0	6.5
Post-Manipulation Day 1	0.0	5.0
Post-Manipulation Day 2	0.0	5.5
Post-Manipulation Day 3	0.0	7.0
Post-Manipulation Day 4	1.5	6.0
Average Dynamic Pain		
Evening of Manipulation	0.0	6.5
Post-Manipulation Day 1	1.8	6.5
Post-Manipulation Day 2	1.0	6.0
Post-Manipulation Day 3	1.0	7.0
Post-Manipulation Day 4	3.5	6.0
Oxycodone (tablets)		
Day of Manipulation	0.0	0.5
Post-Manipulation Day 1	0.5	1.0
Post-Manipulation Day 2	0.0	4.5
Post-Manipulation Day 3	0.0	6.0
Post-Manipulation Day 4	0.0	5.0
Wake-ups (insomnia =10)		
Night of Manipulation	0.0	1.5
Post-Manipulation Night 1	0.0	1.0
Post-Manipulation Night 2	0.0	1.0
Post-Manipulation Night 3	0.0	1.0