

# Postoperative pain management strategies for a 14 year old presenting for a shoulder arthroscopy and possible labral repair

Arjunan Ganesh, MBBS and Lynne G. Maxwell, MD  
The Children's Hospital of Philadelphia and University of Pennsylvania  
School of Medicine  
Philadelphia, PA

## Objectives:

- 1) Understand the innervation of the shoulder and the anatomy of the interscalene block
- 2) Discuss the various options (including advantages and disadvantages) for postoperative pain management following arthroscopic procedures on the shoulder
- 3) Review the controversies surrounding the performance of the interscalene block (ISB) under general anesthesia.
- 4) Discuss the various techniques used to perform ISB and the role of ultrasound.
- 5) Discuss potential complications and the follow up of these patients.

## Description of case:

A 14 year old 48 kg boy (ASA I), with a history of dislocation of the left shoulder, presents for a left shoulder arthroscopy and labral repair under general anesthesia. PSH includes an ACL repair a year ago at another hospital. A morphine PCA was used for postoperative pain control. Severe nausea and vomiting was a complication.

The boy's dad mentions that he (the dad) had recently undergone a similar procedure and that his postoperative pain was very well controlled by a catheter in his neck that "blocked the nerves to his shoulder". He requests the same for his son if possible. The boy's dad, however, quickly adds that he did not enjoy placement of the catheter as it took a long time and was painful sometimes. He hopes that his son can have the catheter placed while he is asleep. You happen to work at a center where continuous ISBs are performed.

- 1) How will you obtain informed consent?
- 2) Will you discuss other alternatives for postoperative pain management? If so, why and what are they?

You decide to perform continuous ISB.

- 1) Will you do it awake and sedated or under general anesthesia? Why?
- 2) What is the nerve supply of the shoulder?
- 3) What equipment will you need?

You have decided to perform the block under general anesthesia. The patient is now in the OR.

- 1) Will you intubate the patient?
- 2) Describe the procedure. How will you document it on the chart?
- 3) What local anesthetic will you use and why? Will you add epinephrine?
- 4) What are the potential complications? How can you avoid them?

The catheter has been placed and bolused with the local anesthetic. You have decided to avoid using opioids if the block was successful. 30 minutes later, the surgeon makes the incision for the anterior port placement. The patient's heart rate goes up from 60/min to 102/min.

- 1) What could be the reasons? Do you think that your block is working? What will you do?

The surgery proceeds and over the next 5 minutes the heart rate settles down to 65/min and stays that way until completion of the procedure. The patient is extubated in the OR uneventfully and taken to the PACU. 10 minutes later the patient is fully awake and looks anxious.

- 1) How will you determine if your block was successful?
- 2) What neurological exam will you perform?

The patient complains of a little uneasiness with his breathing. Pulse oximetry reads 99% on room air.

- 1) How will you proceed?

Another 30 minutes pass by. The patient looks very comfortable and is on a continuous infusion of local anesthetic via the interscalene catheter. He is taking liquids, has no nausea/vomiting and is requesting solid food. His only complaint is that he cannot open his left eye completely. The surgeon comes by and remarks "He is looking great. Can I send him home?"

- 1) What will be your response?
- 2) Why is he unable to open his left eye well?
- 3) If you decide to send the patient home, what instructions will you provide to the patient and his parent(s) and how will you monitor?
- 4) How long do you plan to continue the infusion and why? Do you have to bring the patient back for catheter removal?

## References:

1-12

1. Benumof JL: Permanent loss of cervical spinal cord function associated with interscalene block performed under general anesthesia. *Anesthesiology* 2000; 93: 1541-4
2. Chao D, Young S, Cawley P: Postoperative pain management for arthroscopic shoulder surgery: interscalene block versus patient-controlled infusion of 0.25% bupivacaine. *Am J Orthop* 2006; 35: 231-4
3. Dadure C, Capdevila X: Continuous peripheral nerve blocks in children. *Best Pract Res Clin Anaesthesiol* 2005; 19: 309-21
4. Dalens B: Some current controversies in paediatric regional anaesthesia. *Curr Opin Anaesthesiol* 2006; 19: 301-8
5. Delaunay L, Souron V, Lafosse L, Marret E, Toussaint B: Analgesia after arthroscopic rotator cuff repair: subacromial versus interscalene continuous infusion of ropivacaine. *Reg Anesth Pain Med* 2005; 30: 117-22
6. Ilfeld BM, Enneking FK: Continuous peripheral nerve blocks at home: a review. *Anesth Analg* 2005; 100: 1822-33
7. Ilfeld BM, Vandenborne K, Duncan PW, Sessler DI, Enneking FK, Shuster JJ, Theriaque DW, Chmielewski TL, Spadoni EH, Wright TW: Ambulatory Continuous Interscalene Nerve Blocks Decrease the Time to Discharge Readiness after Total Shoulder Arthroplasty: A Randomized, Triple-masked, Placebo-controlled Study. *Anesthesiology* 2006; 105: 999-1007
8. Ilfeld BM, Wright TW, Enneking FK, Morey TE: Joint range of motion after total shoulder arthroplasty with and without a continuous interscalene nerve block: a retrospective, case-control study. *Reg Anesth Pain Med* 2005; 30: 429-33
9. Klein SM, Nielsen KC: Brachial plexus blocks: infusions and other mechanisms to provide prolonged analgesia. *Curr Opin Anaesthesiol* 2003; 16: 393-9
10. Schwemmer U, Papenfuss T, Greim C, Brederlau J, Roewer N: Ultrasound-guided interscalene brachial plexus anaesthesia: differences in success between patients of normal and excessive weight. *Ultraschall Med* 2006; 27: 245-50
11. van de Putte P, van der Vorst M: Continuous interscalene block using a stimulating catheter: a review of the technique. *Acta Anaesthesiol Belg* 2005; 56: 25-30
12. Giaufre E, Dalens B, Gombert A: Epidemiology and morbidity of regional anesthesia in children: a one-year prospective survey of the French-Language Society of Pediatric Anesthesiologists. *Anesth Analg* 1996; 83: 904-12