Postop Management of Peripheral Nerve Blocks

As the department of anesthesia gains more experience with peripheral nerve blocks, we will be expanding the use of regional anesthesia for acute pain management. The following information will hopefully help in the postop management of patients who have received blocks.

Regional anesthesia can provide pre-emptive as well as postoperative analgesia. Ideally the duration of the regional anesthesia should match the duration of pain of the surgery. However the ideal scenario does not occur. We currently have a mix of single shot blocks that require transition to narcotics when the blocks wear off as well as continuous catheters. Until we can master a consistent success with continuous catheters, the single shot technique will be preferred (especially in the teaching situation). The future promises an expanding the use of continuous catheters both for inpatients as well as for outpatients.

Preamble: All patients who are candidates for regional blocks should receive Vioxx preop, and continue to receive Vioxx postop until analgesia is no longer required. All unsuccessful blocks will be identified in the PACU. Patients with failed blocks will receive appropriate alternate route of analgesics. We are currently trialing various stimulating catheters to help us better predict the success of the block in patients receiving continuous catheter infusions.

Single shot blocks: The most common single shot block used is the interscalene blocks for shoulder surgery. These blocks last between 12-16 hours. Frequently, the patients start to experience pain in the early mornings (3am!) and are encouraged to use their iv PCA bolus as soon as they have sensation in the blocked extremity. Long acting oxycontin should be started the morning after surgery, with oxycodone for breakthrough pain. Once po analgesics are effective, the patients can be weaned off the iv PCA.

Future plans:

The duration of the single shot blocks can be prolonged by up to 12 hours with the addition of clonidine. However, clonidine is not available in Canada without individual HPB special request – insurmountable paper work! The addition of sufentanil to the local anesthetic appears to prolong the analgesia and will be explored. This may allow the patient to remain comfortable until the sunrises and allow a smoother transition to oral analgesics.

Continuous catheters should solve the problem of inadequate duration, however it is presently technically challenging, and interscalene catheters tend not to remain in situ for longer than 48 hours. If they do remain intact, consider weaning POD3.

Continuous catheters:

Ropivacaine is used for all continuous infusions. There are presently 2 delivery systems for the continuous catheters.

1. *Baxter pumps.* These are the same pumps as those used for epidural infusions and allow for PCA modality. Continuous infusion rates of 0.2% ropivacaine usually start at 5ml/h with PCA boluses of 5ml q30 min prn. Just like the epidural solutions, the rates can be titrated to optimize analgesia.

2. *Elastomeric pumps*. These pumps work by the deflation of the elastomeric balloon to deliver a CONSTANT rate of infusion. They are also known as "baby bottle", or "Baxter infusors". Variable rates are available in the market, but we have chosen the pump that delivers solution at a fixed rate of 5ml/h to minimize error in the delivery systems. The optimal concentration appears to be 0.3% to ensure analgesia in the majority of patients. These pumps are ideally suited for home delivery. In certain circumstances, they will also be used in the inpatient setting. Since the rate of delivery cannot be adjusted in these pumps, inadequate analgesia should be treated with adjunctive po/iv analgesics.

Femoral catheters

The use of femoral catheters for total knee surgery significantly decreases the amount of narcotics required and improves rehabilitation postoperatively. Although in theory the catheter may be advanced to the level of the lumbosacral plexus thereby rendering total analgesia to the knee, our experience to date shows solid analgesia to the area innervated by the femoral nerve (great for physiotherapy), but patient can complain of posterior knee discomfort. The latter usually responds to 10 to 20 mg Oxycontin bid. Patients should be instructed to use the PCA bolus prior to physiotherapy to optimize range of motion.

It is important to minimize motor block as it interferes with ambulation. Some patients have persistent motor block beyond day 5 – day of discharge per orthopedic care map, requiring transfer to short term rehab facility which defeats the purpose of expedited recovery. Once physio achieves 90 degree range of motion (usually around POD2), or sooner if profound quadriceps weakness is present, continuous infusion should be discontinued. At this point, the PCA bolus may be increased to 10ml to facilitate physio.

Doctor the patient is in pain!

All patients on the ward with continuous catheters should have a *proven functioning* catheter. Most likely causes of loss of analgesia are:

1. *Technical problem*. Check and ensure pump and infusion tubings are properly functioning and patent.

2. *Inadequate dose*. Increase rate of infusion.
3. *Catheter extruded*. Check catheter length at skin and compare to anesthetic record.
4. *Posterior knee pain*. Use oxycontin for posterior knee pain.

On receiving such a call, re-establish analgesia with a bolus of local anesthetic (suggest 0.5% marcaine 5-10ml) and proceed to above steps1, 2 & 3.

Patients on the elastomeric pump who are experiencing inadequate analgesia despite properly functioning pump and patent tubing should receive po/iv analgesic supplements and continue with the pump until empty.

Doctor, patient has numb limb

Sensory blockade in the region innervated by the nerve plexus suggests effective analgesia. The sensory blockade can be very dense initially if high concentrations of local anesthetics are used at the start of surgery. This should decrease after day 1. Personnel should be reminded to protect the limb from pressure injuries while a dense sensory blockade exists.

New onset sensory block is more concerning. Consider D/C local anesthetic until blockade resolves to assess the reversibility of the block versus neuropathy.

Doctor, patient cannot move leg

Some quadriceps weakness is expected with the initial bolus of local anesthetic as well as with the continuous infusion. The continuous infusion should be stopped when profound motor weakness is present.

Note that sciatic nerve injury can occur in 2-5% of total hip arthroplasty and is unlikely related to the femoral catheter. It is important to communicate such findings with the surgeons and determine the need for further investigations such as imaging to rule out hematoma that may need to be decompressed.

Weaning

All catheters should be continued for a <u>minimum</u> of 48 hours. The duration of infusion should be adjusted to match the duration of analgesia requirement for the particular type of surgery. Weaning should proceed as per protocol – laminated copy is available on the ward in the APS binder.