Phantom limb pain in children is not well described but refers to painful sensations following detachment of an extremity. It is known to occur after traumatic or surgical amputation. Phantom limb pain is more likely to occur if the patient experienced pain prior to amputation. We describe the pain management of an unfortunate child at high risk for phantom limb pain who underwent amputation for high grade osteosarcoma four months after the pain began.

**Introduction**

Phantom limb pain in children is not well described but refers to painful sensations following detachment of an extremity. It is known to occur after traumatic or surgical amputation. Phantom limb pain is more likely to occur if the patient experienced pain prior to amputation. We describe the pain management of an unfortunate child at high risk for phantom limb pain who underwent amputation for high grade osteosarcoma four months after the pain began.

**Case Summary**

**Pre-Op:**
- 13 year old male with intractable pain in the left proximal humerus secondary to rapidly growing high grade osteosarcoma
- Pain management with gabapentin, morphine PCA and interscalene catheter x 5 days
- Progression of tumor despite aggressive chemotherapy
- Total daily dose of 80mg of IV morphine with inadequate pain control
- Forequarter amputation planned to help control pain

**Intra-Op:**
- General Anesthesia
- Ultrasound guided interscalene catheter placement
- Ultrasound guided paravertebral catheter placement at T5 threaded to T3 for scapular analgesia

**Post-Op:**
- Interscalene catheter: Ropivacaine 0.2% + clonidine 2 mcg/ml @ 5mL/hr
- Paravertebral catheter: Ropivacaine 0.2% + clonidine 2 mcg/ml @ 6mL/hr
- Morphine dose decreased to 6mg per day
- Catheters discontinued on Post-Op Day 4
- Complained of “shocks where my arm was”
- Gabapentin continued for treatment of neuropathic pain

**One Month Post-Op:**
- Gabapentin 1800mg TID for neuropathic pain
- Morphine discontinued

**Discussion**

Osteosarcomas are notoriously painful lesions that tend to occur in the metaphyses of long bones. The use of regional anesthesia techniques and anticonvulsants like gabapentin are described as alleviating phantom limb pain following an amputation (1). The goal for our patient was palliation and improved quality of life given his prognosis was poor. The use of upper extremity continuous catheters in children is not well described but intuitively would seem to be helpful in the situation we confronted.

Phantom limb pain is a neuropathic phenomenon most common in adults and relatively rare in children that involves both the PNS and CNS. Chronic pain prior to amputation may predict phantom pain after the procedure (2).

A-delta fibers are large myelinated nerves that rapidly convey sharp pain. C fibers are small unmyelinated nerves that slowly transmit pain to the central nervous system (2). Injury to these nerves through disease or trauma such as amputation can result in maladaptation of the CNS. The pathways that served the amputated limb are still present in the central nervous system (cortex, thalamus, brainstem and spinal cord) leading to abnormal sensation felt in the absent limb (2).

A recent retrospective review of children with bony malignancies showed no statistically significant association between age or the presence of pre-amputation pain with phantom limb pain in children.

References:

Intra-op image showing brachial plexus Forequarter Amputation