The Use of a Continuous Peripheral Nerve Catheter and Elastomeric Infusion Pump to Successfully Facilitate Outpatient Rehabilitation in a Seven-Year Old Child with Refractory Upper Extremity Complex Regional Pain Syndrome

Austin T, Franklin A
Vanderbilt University Medical Center, Nashville, TN, USA

The goal in management of children with complex regional pain syndrome (CRPS) is to facilitate early restoration of function(1). Though physical therapy is the cornerstone of treatment of CRPS in both the adult and pediatric population, the ability of consistent physical therapy regimens to restore function in children appears to be greater, possibly due to the plasticity of their nervous systems(2). We present the youngest patient ever reported thus far who successfully underwent aggressive outpatient rehabilitation with the aid of a continuous peripheral nerve catheter and disposable elastomeric infusion pain pump(3). A healthy 7-year-old female sustained a forearm supracondylar fracture that required operative fixation. Her recovery was complicated by compartment syndrome and she underwent extensive forearm fasciotomy. She subsequently developed rapidly progressive CRPS of this extremity as manifested by severe allodynia, distal cyanosis, loss of forearm hair, and nail bed changes. These issues caused significant functional limitations including withdrawal from school and behavioral changes. Her symptoms progressed despite multimodal pharmacological management as well as desensitization therapy. Development of hand contractures resulted in the inability to participate in physical therapy. Plans for interventional therapy had to take into consideration significant socioeconomic challenges including the fact that the child lived four hours away. Therefore, we performed an ultrasound-guided stellate ganglion block and also placed an ultrasound-guided supraclavicular brachial plexus catheter under the same general anesthetic. The catheter was then connected to an elastomeric pump that delivered an infusion of dilute ropivacaine and clonidine to provide sympathetic blockade with minimal sensory effects and no motor blockade. After discharge to home, she underwent a twice-daily physical/occupational therapy regimen with home self-therapies every four hours. After four days, the parents discarded the disposable pump and the patients catheter was removed at her one-week follow up clinic visit. There was complete resolution of allodynia and her vasomotor changes were nearly resolved. She soon underwent a second round of single bolus sympathetic and brachial plexus blockade under the same anesthetic for a plastic surgery scar revision. After this procedure, the patient had complete resolution of her CRPS symptoms and returned to school. She remains symptom free at the time of this writing. Interventional management of pediatric CRPS poses unique challenges not encountered in the adult population. We have demonstrated that outpatient continuous nerve blockade may be a safe, cost-effective management strategy in children as young as seven years old with refractory disease.