

# A Case Series: Complex regional pain syndrome 1 and migraines in children

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**Introduction:** Complex regional pain syndrome type 1 (CRPS) is a clinical syndrome characterized by pain, edema, and vasomotor dysfunction, precipitated by an injury, surgery, or vascular event. Migraine is the most common acute and recurrent headache syndrome in children. We found no reports describing an association between migraine headaches and CRPS 1 in children. We report a series of four patients who presented meeting diagnostic criteria for both migraine and CRPS 1, and speculate on common mechanisms.

## Case Reports:

Case 1: An 11-year-old boy with basilar migraines presented with bilateral lower extremity CRPS 1. He was admitted for physical therapy, facilitated by continuous epidural analgesia. His migraines are controlled with amitriptyline, rizatriptan, and phenytoin.

Case 2: A 15-year-old girl with migraines controlled on amitriptyline developed pain on the dorsum of the right foot extending to the ankle and right knee pain. She was started on gabapentin and physical therapy; amitriptyline was continued for migraine prophylaxis.

Case 3: An 11-year-old girl with an ankle injury requiring casting and immobilizing presented with left foot pain and calf atrophy. She also developed chronic daily migraines that did not respond to ibuprofen or acetaminophen. She responded to physical therapy and gabapentin, continuing amitriptyline and zolmitriptan for migraine prophylaxis.

Case 4: A 15-year-old girl presented with left foot pain after a calcaneous biopsy and casting. She also had recurrent headaches that began with her menses at age 10. Two IV regional blocks with lidocaine and clonidine were performed enabling her to ambulate without crutches. Her migraines are controlled with ibuprofen and amitriptyline.

	Case 1	Case 2	Case 3	Case 4
Age of Onset	11 years old	15 years old	11 years old	11 years old
CRPS 1				
Precipitating Event	Severe Migraine	None	Left ankle fracture	Left foot osteomyelitis
Pain	Pins and Needles, Cramping, Burning	Stabbing, Burning, Tingling, Numb, Throbbing	Sharp, Burning, Throbbing	Throbbing, Sharp, Shooting
Allodynia	Yes	Yes	Yes	Yes
Location	Bilateral lower legs	Right foot, Right knee	Left ankle	Left foot to mid calf
Temperature and Color Changes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Previous History of CRPS	Yes	Yes	No	Yes
Neuropathic Pain	Herpes zoster at age 7	None	Left facial nerve palsy-resolved	None
Age of Onset of Migraine	10 years old	13 years old	11 years old	10 years old
Type of Migraine	Basilar	Frequent episodic	Frequent episodic	Frequent episodic
Family History of Migraine	Yes	Yes	Yes	Yes

**Discussion:** The connection between migraines and CRPS has not been explored. Are the symptoms of migraine and CRPS in these four children independent events or does the presence of one condition predispose the patient to the other? The temporal relationship between migraine and CRPS symptoms in these four children suggests common pathophysiological

mechanisms. The prior history of CRPS in three of the children along with positive family histories of migraine suggests an innate susceptibility to both central and peripheral nerve abnormalities. Dysfunction of the autonomic nervous system is also considered to be involved in the clinical findings of both migraines and CRPS. Localized neurogenic inflammation might be involved in CRPS and migraine. Calcitonin gene-related peptide (CGRP) is a 37 amino acid neuropeptide expressed in central and peripheral nervous systems including the nerves of the trigeminal ganglion. Blair et al. reported elevated serum concentrations of CGRP in CRPS patients. Elevation of CGRP levels in external jugular venous blood is found in patients with either common or classic migraine. We suspect that both migraine headache and CRPS 1 share pathways that are not yet well defined.

**References:**

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