Complex Regional Pain Syndrome Type I in a 10-Year-Old Soccer Player

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Occasionally, athletes may complain of pain or other symptoms that are out of proportion or inconsistent with preceding events. Complex Regional Pain Syndrome (CRPS) Type I is a condition considered rare in children, but it may be unrecognized and misdiagnosed in the pediatric community. Because children who develop this condition may not be immediately identified by clinicians, it is important that physicians and athletic trainers are familiar with the clinical presentation of CRPS Type I.

Case Report

The patient was a ten year-old Caucasian female, height 140 cm (55 in.) and mass 31.8 kg (70 lb.) who played recreational club soccer. She complained of severe pain, a sensation of cold, and unwillingness to bear weight on the left foot and lower leg.

History

The patient had been playing indoor soccer two to three times weekly over the 3-month period preceding the onset of symptoms. Approximately 2 to 3 weeks after transition to the spring outdoor season, she complained of pain on the plantar surface of the first metatarsaphalangeal (MTP) joint of the left foot, which was similar to that associated with sesamoid inflammation or turf toe. She could not recall any incident that might have caused an acute injury to the area. She was initially treated with ice packs for 15 minutes every two hours.

Over the next 48 hours, the patient complained of increased pain over the first MTP joint, mild to moderate pain throughout the plantar surface and medial aspect of the foot, localized swelling around the first MTP joint, and a sensation of cold throughout the foot. She also stated that the pain increased when weight bearing. Although the foot was being treated with contrast baths, two days later the patient had an unexplained, sudden, and significant increase in her symptoms including allodynia (i.e., pain from a stimulus, which is not normally painful or that is disproportionate to...
the applied stimulus) and hyperesthesia of the foot and ankle. There was also intermittent blue discoloration of the foot, especially in the region of the third and fourth toes. In addition, the athlete developed “shiny” skin on the foot and distal lower leg with intermittent mottling. She was unable, or unwilling, to actively or passively plantar flex or dorsiflex the first MTP joint because of her pain. She was immediately taken to her pediatrician for evaluation.

Physical Examination and Diagnostic Testing

The athlete presented her pediatrician with severe pain in the “ball” and plantar surface of the left foot and limited active range-of-motion of the MTP joint. She also complained of pain during passive dorsiflexion and plantar flexion of the MTP joint and she was unwilling to bear weight. Physical examination revealed tenderness on the medial and plantar surfaces of the region of the first MTP joint. The skin of the left foot was cool to the touch. Occasionally, her toes were slightly cyanotic, but would spontaneously return to a pink coloration. Femoral and dorsalis pedis pulses were normal and there was no edema. She was diagnosed as having Reflex Sympathetic Dystrophy (RSD). The physician ordered the continuation of contrast bath therapy.

That evening, her symptoms increased and the toes again became cyanotic. The patient stated that her foot felt cold. She was taken to the emergency room, where plain radiographs of the foot and ankle were obtained and interpreted as normal. She was placed in a posterior splint, instructed to avoid weight bearing, and prescribed ibuprofen 200-300 mg twice daily for pain.

The athlete was subsequently seen by a vascular specialist, pediatric anesthesiologist/pain specialist, and an orthopedic surgeon. Her clinical presentation at this time was consistent with the initial examination. Clinical evaluation by the pain specialist also included measurement of her skin temperature on the dorsal surface of both feet. There was a 7.2°C difference in surface temperature between feet, with the affected foot being 24.2°C and the unaffected side being 31.4°C.

Ultrasonography and Doppler tests did not reveal any vascular abnormalities. Blood tests included a Complete Blood Count (CBC), platelet count, Prothrombin Time (PT), and Partial Thromboplastin Time (PTT) for clotting and coagulation, a blood chemistry screen, Erythrocyte Sedimentation Rate (ESR), C-Reactive Protein (CRP) for systemic inflammation and Lyme titers, all of which were normal. A Technetium bone scan of her feet was ordered, both of which were normal.

Diagnosis

Complex Regional Pain Syndrome Type I.

Treatment

This young athlete’s treatment regimen included daily physical therapy consisting of desensitization using various tactile stimuli, passive and active range-of-motion exercises, transcutaneous electrical nerve stimulation, and increased weight bearing. She was initially prescribed Tylenol with codeine for pain. This provided limited help with sleeping but did not provide significant overall pain relief. The pediatric pain specialist prescribed Neurontin at an elevated dosage of 900 mg per day until symptoms were controlled, followed by a regular daily dosage of 100 mg in the morning, 100 mg at midday, and 300 mg at bedtime. Additionally, 5% lidocaine transdermal patches were placed over the area of the MTP joint of the left foot as needed by the patient to assist in pain control.

After two weeks of treatment that included a home program of contrast baths, desensitization with cotton balls and sandpaper stroking, and range-of-motion exercises, the patient’s pain, allodynia, and hyperesthesia decreased dramatically to almost no symptoms. She progressed to full weight bearing and returned to activities of daily living (ADL) as tolerated over the following two and one half weeks. At the end of this period, she was functionally tested and demonstrated no deficits in strength, agility, or sport-related activities, and she returned to full activity. The patient had a follow-up physical examination two months after the onset of the symptoms, at which time she presented no signs or symptoms, suggesting that she had recovered from the syndrome.

Discussion

Complex Regional Pain Syndrome Type I (CRPS-I; formerly designated as Reflex Sympathetic Dystrophy) is defined as “continuous pain in a portion of an extremity after trauma, which may include fracture, but does not involve a major nerve, and is associated with sympathetic hyperactivity.” It is a regional neuropathic pain problem that may affect one or more