Development of Complex Regional Pain Syndrome after a Snake Bite: A Case Report

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The occurrence of CRPS after a snake bite was very rare, only two cases were reported worldwide. Here we report a case that the 44-year-old female patient bitten by snakes CRPS type 1 was treated consecutive intravenous regional block, lumbar sympathectomy and antiepileptic drug therapy, also discuss the possible pathophysiology. (Korean J Pain 2014; 27: 68-71)

Key Words:
complex regional pain syndromes, snake bite.

Complex regional pain syndrome (CRPS) is defined as a series of symptoms such continuous pain, allodynia, hyperalgesia, vasomotor abnormality, usually after an injury or trauma [1]. It is completely unaware whether CRPS is caused by the nerve damage or a soft tissue injury. In recent years, pathophysiology of various mechanisms is thought to involve in the development of CRPS [2]. The occurrence of CRPS after snake bite was very rare, only two cases were reported worldwide [3,4]. De Mos et al. suggested that pathology of the autonomic and somatic nervous system, as well as the roles of neurogenic inflammation, hypoxia, and the contribution of psychological factors were involved [5]. This case is a rare example of CRPS after snake bites, we are to describe the possible pathophysiology at this condition and course of treatment.

CASE REPORT

A 44-year-old woman without any specific medical history presented to the emergency room of our hospital after a snake bite, (Agkistrodon assurienensis, Chinese viper) near the right lateral malleolus, in a parking lot three months before being referred to the pain clinic. At that time, the patient complained of severe edema up to the right femoral region, acute pain, abdominal pain, muscle pain, double vision, dizziness, and nausea. Agkistrodon halys antivenin (6,000 IU) was intravenously injected, followed by the administration of antitetanus immunoglobulin, an antihistamine, a steroid, and antibiotics. At the time of the injury, the Visual Analogue Scale (VAS) pain intensity score was 100/100 (the patient felt as if her foot was exploding). The score gradually reduced up to 4 days after...
the injury as the swelling decreased.

When the patient was referred to our pain clinic during the 3rd month after the injury (Fig. 1), she had static allodynia on the 2nd, 3rd, and 4th digits of the right foot along with repetitive pain that felt like needle stabs. The patient also exhibited hyperalgesia in the entire foot as well as constant tingling sensation the upper lateral malleolus. The pain worsened during walking: she experienced stiffness and edema with a VAS intensity of approximately 50/100 on the lateral sole and the top of the foot in addition to pain in the foot at the slightest exertion, such as walking up or down the stairs. The patient felt a sickly cold sensation in the heel that was alleviated by using a hot or cold pack. An electrophysiologic study performed at the end of 1st month after the injury indicated findings suggestive of damage to the right superficial peroneal nerve or around peripheral nerve; however, no abnormal features were observed in a 3-phase bone scan or on thermographic examination.

On the first day of the visit, an intravenous regional block was performed with 40 cc of 0.5% mepivacaine and 30 mg of ketorolac. In addition, 300 mg/day of gabapentin was administered in three divided dose. The constant tingling sensation and pain the upper lateral malleolus completely disappeared but she sporadically felt tingling pain near the bite area. The pain during walking decreased to a VAS intensity of 20/100, but the cold sensation in the heel persisted. On the 3rd day, when performing a secondary intravenous regional block with 40 cc 0.5% mepivacaine and 30 mg ketorolac, the patient developed urticaria in the entire calf with severe pain on the bite site and in the stiff and painful regions during walking. Therefore, dexamethasone 5 mg was injected through the same intravenous route as the mepivacaine injection. The severe pain diminished immediately after the injection.

The next day, the patient had minimal pain, when relaxed, and experienced pain with a VAS intensity of 15/100 on the lateral dorsal part of the foot while wearing shoes and walking. However, the sickly cold sensation was still present in the heel. On the 5th day, a lumbar sympathetic ganglion block was performed on the 2nd and 3rd vertebrae. The cold sensation in the heel reduced for 2–3 days after the block but returned at the same level as before; therefore, we decided to perform a sympathectomy using alcohol. The preoperative temperature of both heels was almost the same (left heel, 31.1°C; right heel, 31.0°C), 2 ml of contrast medium and 2 ml of 4% lidocaine were injected in the sympathetic ganglia at the L2 and L3 level. After a 10-min wait to confirm the absence of motor weakness and other abnormalities, 3 ml of 99% alcohol was injected on each side. The foot temperature at 15 min after the injection indicated a difference of 3.3°C between the left (32.1°C) and right (35.4°C) side, and the patient felt a burning sensation on her foot.

The cold sensation in the heel completely disappeared 2 days after the sympathectomy. The following day, the patient was discharged with a VAS score of 10/100 and similar levels of pain while walking and relaxing. The dose of gabapentin was increased to 600 mg tid. The decrease in the pain was maintained during the 2-month follow-up period. A reduced dose of gabapentin (300 mg tid) was administered for the next 2 months. When the pain disappeared, administration of the drug (gabapentin 300 mg tid) as well as follow-up were discontinued.

**DISCUSSION**

Complex regional pain syndrome (CRPS), characterized by continuous pain regardless of the inducing stimulus, manifests as at least 3 of 4 categories including sense, vascular mobility, edema, and motor function, and it is diagnosed as such when >2 positive symptoms of the 4 categories mentioned above are present [1]. In the present case, the patient complained of hyperalgesia, allodynia, edema, and decreased range of motion after receiving a noxious stimulus due to the snake bite. Physical examina-