Multimodal analgesia in crotalid snakebite envenomation: A novel use of femoral nerve block

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ABSTRACT

Snakebite envenomations occur throughout the United States, with most envenomations resulting from Crotalid bites. These envenomations can result in severe pain despite aggressive analgesia due to effects of venom toxins. We report a case in which we treated a 44-year-old man who sustained a Copperhead (Agkistrodon contortrix) bite to his left hallux. He developed signs and symptoms of progressive local toxicity, including a hemorrhagic bulla at the bite site, foot and lower leg edema, and severe pain from the foot radiating into his groin. His leg compartments were soft and compressible, and his creatine kinase level was normal, so there was not concern for rhabdomyolysis or compartment syndrome. His prothrombin time, activated partial thromboplastin time, and fibrinogen levels were normal, and he had no clinical signs of coagulopathy. He initially presented to an outside facility, where four initial vials of Crotalidae Polyvalent Immune Fab antivenom (CroFab™) were administered. He was transferred to our referral hospital emergency department for management by our medical toxicology service.

Despite receiving multiple doses of intravenous fentanyl, he continued to have burning, 10 out of 10 pain in the left leg. Additionally, we provided intravenous hydromorphone, oral acetaminophen, and ibuprofen, but his pain remained severe. We elected to perform a fascia iliaca compartment femoral nerve block to provide additional analgesia. Under dynamic ultrasound guidance, we injected 20 mL of 0.25% bupivacaine. Perineural fluid spread was visualized on ultrasound. Within 45 min, the patient noted significant pain relief in the upper leg which lasted approximately 8 h. This allowed him to sleep through the night while receiving additional antivenom doses. The patient was admitted to a medical-surgical floor, where he participated in physical therapy the next day and was discharged 48 h after admission to our hospital.

3. Discussion

To our knowledge, regional anesthesia with peripheral nerve block for snakebite envenomation is a novel application. Prior reports documented improved analgesia using a digital block for lionfish envenomation in the finger [2] and a wrist nerve block for platypus envenomation in the hand [3]. Femoral nerve block, especially under ultrasound guidance, is a tool in multimodal analgesia that is growing within the emergency medicine field which obverts or reduces the need for opioids [4]. This technique produces dermatomal anesthesia in the anteromedial upper leg. Although less familiar to emergency physicians, this provides another safe option to treat severe pain in the lower extremity.

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physicians, sciatic nerve block can provide additional anesthesia in the lower leg where needed [5]. We did not perform a digital block of the bitten toe because of local edema and to avoid increasing soft tissue pressure within the toe. A limitation of this technique is decreased ability to monitor pain progression in cases with elevated concern for severe rhabdomyolysis or compartment syndrome. Additionally, risks of this procedure are acknowledged, including intraneural injection and vascular puncture or injection. We advise performing this procedure with cardiac telemetry to monitor for local anesthetic systemic toxicity, with intralipid immediately available.

In conclusion, we demonstrate fascia iliaca compartment femoral nerve block may be a safe, beneficial technique in providing multimodal analgesia in cases of refractory leg pain from Crotalid envenomation.

Declarations of interest

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References