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Case Report

Serial Stellate Ganglion Blocks for Intractable Postherpetic Itching in a Pediatric Patient: A Case Report

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Background: While intractable itching may be rarely associated with postherpetic neuralgia, it can have catastrophic complications if present.

Method: We highlight a severe case of postherpetic itching in a 10-year-old male with Fanconi's and aplastic anemia, refractory to conventional treatments and requiring intravenous sedation.

Results: Our use of 3 sequential stellate ganglion blocks with 5.5 mL of 0.25% bupivacaine provided significant improvement of the symptoms for 4 months after the last procedure.

Conclusion: Although further evaluation is needed, we feel that novel use of sympathetic blockade may provide treatment for intractable itching. Highlighted is the possible influence of the sympathetic system in the pathophysiology of postherpetic itch.

Implication: The use of serial stellate ganglion blocks may be a treatment option for patients with intractable itching and postherpertic neuralgia of the neck and arm region. This technique may lead to more permanent solutions such as pulse radiofrequency lesion or chemical neurolysis of sympathetic ganglions for postherpetic itch.

Key words: Stellate, intractable itching, postherpetic itch, pain, pediatric

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Acute herpes zoster is a painful rash caused by reactivation of latent varicella zoster virus in sensory ganglia. Some patients, however, continue to have pain in the same location, long after the rash has healed, known as postherpetic neuralgia (PHN). Interestingly, instead of the classic symptoms of burning pain and allodynia, some patients predominately complain of severe itching, which may or may not be associated with numbness (1). This is known as postherpetic itch (PHI). Like PHN, PHI occurs in the region of the prior acute zoster rash, and is especially common after zoster of the face and neck. While it has been said that itch and pain cannot occur simultaneously, PHI can occur with or without zoster pain (2).

As an adjunct to medical treatment, sympathetic

nerve blocks have been used for decades with varying degrees of success to treat the pain associated with acute herpes zoster and PHN (3). The following is a case report of the use of sympathetic block in a complicated pediatric patient for treatment of severe intractable PHI.

Case Report

This is the case of a 10-year-old, 70-pound boy with history of Fanconi's syndrome and severe aplastic anemia who presented with severe intractable PHI and secondary local cellulitis of the ipsilateral posterior neck, posterior back, and posterior scalp.

The patient received bone marrow transplants 10 and 4 months prior to presentation. His early post-transplant course was complicated by multiple hospital admissions and viral infections, including disseminated acute varicella zoster. Approximately 3 weeks prior to our visit, he was admitted for recurrent herpetic zoster of the neck and scalp. The shingles lesions eventually began to subside, but the patient experienced an ensuing itch with numbness in the area of the zoster. The severity of the PHI caused persistant scratching with his fingernails into his skin and development of secondary cellulitis.

Multiple treatment approaches were undertaken to attempt to decrease the itching; counseling to avoid scratching, increased parental supervision, strict wound care with heavy, thick dressings to the affected area, padded gloves, and medications. He was given antibiotics, antifungals, and antivirals, as well as H-1 and nonselective antihistamines, intravenous ondansetron, tricyclic antidepressants, anticonvulsants, cromolyn, and analgesics (narcotic and non-narcotic). Finally, as further damage to his neck appeared imminent, the decision was made to sedate the patient using continuous intravenous lorazepam and fentanyl. Failure of these measures to control his itching resulted in consultation of the anesthesia pain service for possible nerve block.

On our initial assessment, the patient was moderately sedated but arousable. The cellulitis was extensive, but localized, and the remainder of his exam was unremarkable. His vital signs were within normal limits and platelet levels and coagulation studies were normal. Also of note, the immunodeficiency as part of his prior treatment for Fanconi's anemia had largely resolved (i.e. CD4, CD8 and B cell counts were adequate).

Procedure

The patient and parents were amenable to the placement of a left stellate ganglion block under monitored anesthesia care after risks, benefits, and alternatives were discussed. Following sterile prep and draping procedures, the patient's neck was extended. After Chassaignac's tubercle was identified, the carotid sheath were retracted laterally with 2 fingers and skin infiltration with 2% lidocaine was performed. A one inch, 20-gauge needle was inserted perpendicular to the skin until direct contact with Chassaignac's tubercle was made. The needle was then withdrawn 2 mm and after negative aspiration for blood and cerebrospinal fluid (CSF), 0.5 mL of 0.25% bupivacaine was administered. There was no change in vital signs after 2 minutes so an additional 5 mL of the same medication was administered in one mL aliquots.

Ptosis and miosis consistent with Horner's syndrome developed on the ipsilateral side within 10 minutes of the block. The ipsilateral arm had a palpable and recorded increase in temperature between 3–4 °C. When the patient recovered, he noted a dramatic relief in the itchiness. The sedatives were kept off and he was allowed to not wear padded gloves. His mood and affect improved substantially, and was noted by his nurses as seeming like a "different kid." This level of relief lasted for 24 hours. Serial blocks were performed on post-block day 3 and day 6. At the time of his hospital discharge, 2 weeks after the stellate ganglion blocks were performed, the wounds were noted to be granulating and the cellulitis had resolved. The patient's intravenous opioid and benzodiazepine regimen was transitioned to an oral regimen, and the patient was discharged with antihistamine and benzodiazepine medications for his pruritus. During the ensuing months, the patient's opioid regimen was discontinued, and at 4 months post procedure, the patient's pruritus, while still present, was significantly improved.

Discussion

Herpes zoster is characterized by hemorrhagic inflammation and neuronal damage and destruction affecting the sensory nerves: dorsal root ganglion, the dorsal root, and the primary afferent peripheral nerve. Primary afferent neuron activity in response to tissue damage causes sensitization of the dorsal horn neurons to further input, resulting in spontaneous ac-

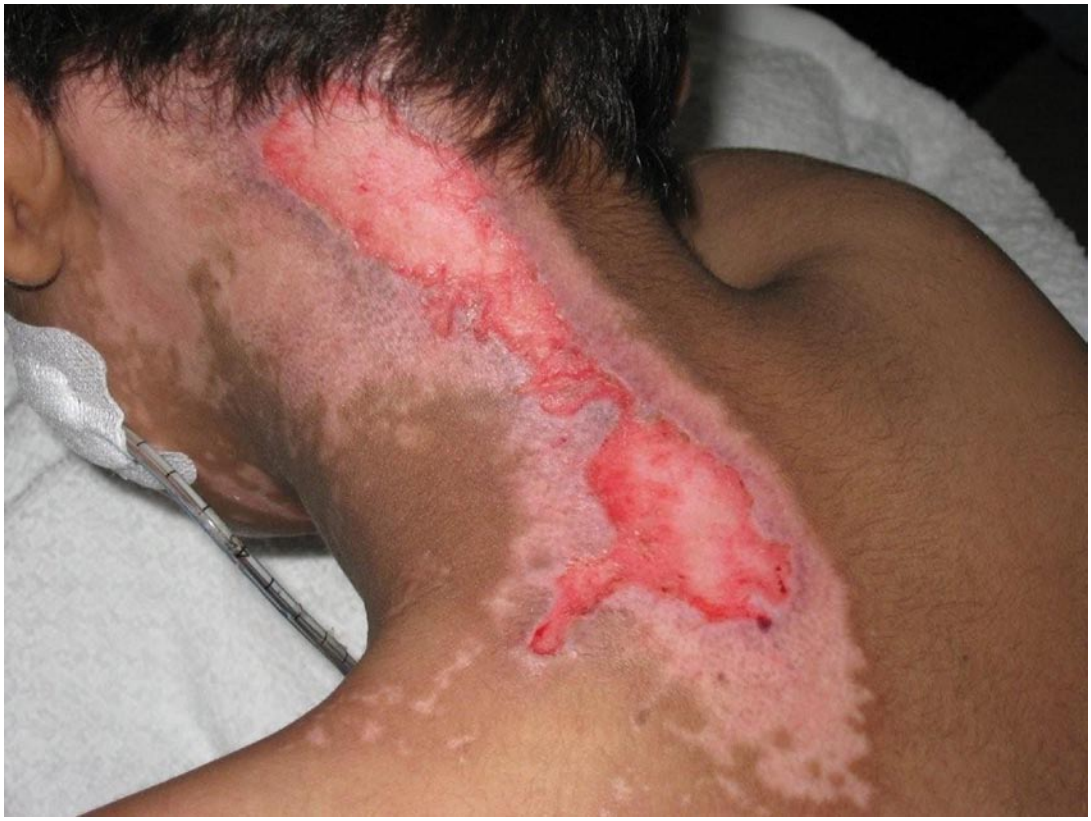

Fig. 1. *The extent of ulceration after itching. Picture taken after third stellate ganglion block showing the beginning of granulation and resolution of cellulitis.*

tivity producing the persistent pain in PHN, even after the tissue damage of herpes zoster heals. It is likely cellular changes found in acute herpes zoster and PHN are related to the itching found in PHI (1).

A proposed mechanism of itching in PHI involves a loss of sensory afferent neurons due to damage during acute zoster, but with preservation of few scattered sensory afferent neurons. This preservation allows for activation of a small number of second-order neurons without recruitment of inhibitor neurons—essentially producing transmission to the brain as itch. Skin infiltration with local anesthetic can block the scattered afferent sensory signals (2). In addition, itch-specific C-fibers have large innervation territories and often extend from a normal dermatome into the adjacent zoster-affected dermatome (3). In the setting of the severe sensory neuron loss in the zoster dermatome, unprovoked firing of these fibers occurs. However, the skin is numb from the sensory loss and this often results in painless injuries from scratching (4).

After zoster-induced nerve injury and inflammation, coupling may occur between primary sensory neurons and sympathetic postganglionic neurons, thus allowing sympathetic mediation of pain and/or itching. Similar to patients with reflex sympathetic dystrophy, PHN patients experience pain with alpha-adrenergic receptor activation (5). Wu et al (5) conducted a review of the literature on sympathetic nerve block efficacy for the treatment of pain caused by zoster and for the prevention of PHN during acute zoster. While it was acknowledged that adequately controlled studies are lacking in number and are difficult to perform, literature review generally supports the use of sympathetic blockade during acute zoster because it is well established that sympathetic blockade reduces the overall duration of pain (6). Sympathetic blockade for prevention of PHN is controversial, and conflicting studies exist; the results for sympathetic blockade in

patients with prolonged PHN are even less hopeful (7). However, our patient was experiencing postherpetic (> 4 months) itch without significant pain, questioning whether previous studies reporting on the effectiveness of sympathetic blocks for zoster pain can be partially attributed to the treatment of itch (8). Currently, pain and/or allodynia are primary outcome variables for sympathetic blockade use in zoster (9).

As compared to adults, invasive nerve blocks such as the stellate ganglion block have additional risk-benefit considerations in the pediatric age group. Heavy sedation or even general anesthesia is usually needed to achieve the level of cooperation needed to perform these blocks safely and expeditiously. Hence, consideration should be given to the idea of placing a percutaneous catheter during the initial block. Then it can be redosed easily and without additional procedures and anesthesia (10). Further safety considerations may include the use of lidocaine, as opposed to bupivacaine, and the use of fluoroscopy or ultrasonography for needle and medication placement. In our case, the child's guardian did not consent for the use of fluoroscopy. As a result, there is a possibility the local anesthetic could have been systemically absorbed and led to the resolution of pruritus as detailed in other case studies which reported successful treatment with intravenous lidocaine (11).

Conclusion

This report involves a successful intervention for intractable itching, which gave our young patient dramatic reprieve from his suffering and may someday provide ideas for advancement for the treatment of PHI. We emphasize further trials and research are needed to understand if this technique should be in the armamentarium for the treatment of PHI. This case report also highlights mechanisms of pain and itch and their relationship to the sympathetic ganglion.

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