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GANGLION IMPAR INJECTION FOR RELIEF OF REFRACTORY ANORECTAL PAIN IN MULTIPLE SCLEROSIS PATIENTS

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Background: Pelvic, perineal, and anorectal pain can be common findings in patients with Multiple Sclerosis (MS). These patients can develop bowel and bladder dysfunction with disease progression, as well as musculoskeletal component of their pain. The ganglion impar injection and radiofrequency ablation procedure are well-documented interventions to treat visceral pain arising from the pelvis as well as nociceptive pain from the anus and rectum.

Case Report: We discuss the cases of two MS patients with significant disease progression who present with anorectal pain refractory to medical and surgical treatment. The ganglion impar block was offered to both of these patients with significant pain relief reported immediately and after several weeks.

Conclusion: Ganglion impar block and radiofrequency ablation are safe and effective interventions for pelvic and perineal pain and can be beneficial for severe refractory anorectal pain in MS patients.

Key words: Rectal pain, pelvic pain, perineal pain, Multiple Sclerosis, ganglion impar, interventional pain, radiofrequency ablation

BACKGROUND

Multiple sclerosis (MS) is an immune-mediated neurological disease that currently affects over 2.2 million people worldwide, with the highest prevalence in North America (prevalence 164.6:100,000) (1). An estimated 46% of patients with MS experience some form of MS-related pain, with estimates ranging from 30%-90% (2). Approximately 30%-35% of these patients seek out treatment for this pain, with a greater percentage requiring daily treatment compared to pain patients without MS. The pain associated with MS is varied, including migraines and cluster headaches, itching, burning, and shooting sensation with pseudo-radicular pain, as well as cramping and aching with spasms and visceral pain (3,4).

Pelvic pain is another often overlooked area of pain for MS patients. Up to 40% of patients with MS develop some form of anorectal dysfunction (5), and 80%-90% of patients develop bladder dysfunction (6). Symptoms of anorectal and pelvic floor dysfunction tend to be associated with more advanced disease and are correlated with longer disease duration, older age, and greater disease disability (7,8). As a result, patients who present with pelvic pain are often already at an advanced stage of MS and have tried oral pain medications or have failed conservative therapy.

The authors present 2 cases of MS-related pelvic pain where patients had relief from outpatient ganglion impar blocks.

Case 1

A 66-year-old female with MS presented with several months of severe anorectal pain with exacerbation of pain with evacuation. She initially was treated for

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chronic constipation with glycerin and enemas. She took acetaminophen for her rectal pain with limited benefit. She met with a colorectal surgeon to discuss surgical options, ultimately opting for laparoscopic end sigmoid colostomy to alleviate evacuation pain. Despite surgery, she continued to experience rectal pain and therefore underwent a ganglion impar block with 3 mL of 0.25% bupivacaine and 10 mg of dexamethasone. She reported 50% relief after the procedure that was sustained for approximately 2 months.

Case 2

A 68-year-old female with MS presented with chronic anorectal pain. She described the pain as an aching, spasmodic rectal pain associated with irritation of the anal skin area. She was using diltiazem cream, lidocaine jelly, acetaminophen, baclofen, and amitriptyline with minimal relief. She was scheduled for a ganglion impar injection for refractory rectal pain and received 3 mL of 0.25% bupivacaine and 10 mg of dexamethasone with the first injection. She reported a 25%-50% reduction in pain within 24 hours after the injection that lasted for approximately one week. She had a repeat ganglion impar injection in 4 weeks with 3 mL of 0.25% bupivacaine and 12 mg of betamethasone. After her second injection, she reported an initial 80% relief with subsequent return of her pain after 2 weeks. Due to the SARS-CoV-2 pandemic, she was not able to schedule any additional procedures for several months. During this time, she was taking tramadol-acetaminophen, baclofen, and gabapentin. She received her third ganglion impar injection 5 months later with 3 mL of 0.25% bupivacaine with 40 mg methylprednisolone with pain relief lasting approximately 6 weeks after the procedure. She was subsequently scheduled for a ganglion impar radiofrequency ablation, which was performed with a 22G 10 mm active tip radiofrequency (RF) needle with 1 mL of 1% lidocaine pre-ablation and 2 mL of 0.25% bupivacaine and 10 mg of dexamethasone post-ablation after thermal radiofrequency at 80 °C for 90 seconds as well as 4 minutes of pulsed radiofrequency ablation. She noted approximately 8 weeks of relief prior to return of pain.

DISCUSSION

MS pain is often categorized as either neuropathic pain or nociceptive pain (9). Neuropathic pain in MS patients is caused by axonal damage, demyelination, and neuroinflammation. The most commonly described neuropathic pain related to MS are dysesthesias, such as burning, tingling, itching, temperature sensation abnormalities, and electric shocks, which tend to affect the extremities.

Nociceptive pain in MS is often a consequence of an associated disability. Patients with lower extremity weakness often have compensatory gaits and postural abnormalities, resulting in back and hip pain (6). Those with prolonged immobility are at increased risk for pressure ulcers (10). The term mixed pain is often given to nociceptive pain that is a result of a neuropathic lesion. Examples include lesions of the corticospinal pathway resulting in tonic spasms—intermittent, involuntary muscle contractions—that can lead to ischemic muscle pain. Central nervous system (CNS) lesions can cause a disinhibition of upper motor neurons that result in spasticity, resulting in a hyperactive stretch reflex and prolonged muscle contraction. Lengthening a contracted muscle causes injury to the muscle fibers and activates the muscular nociceptive receptors.

Neuropathic pelvic pain often presents as perineal numbness, paresthesia, and lancinating pain with or without an associated rectal, urinary, or gynecological dysfunction. First-line treatment of neuropathic pain includes tricyclic antidepressants (TCAs), serotonin/norepinephrine reuptake inhibitors (SNRIs), anticonvulsants, and topical lidocaine (11). Nociceptive pelvic pain, on the other hand, is often visceral in nature and poorly localized, caused by distention and spasm of pelvic organs (12). Bladder and bowel dysfunction can present as either retention or incontinence, owing to the complex coordination of muscles by the central nervous system involved in urinary and fecal evacuation (9). Conservative treatment of pain related to organ distention includes anticholinergic and antispasmodic medications and, in the case of constipation, pro-motility agents, laxatives, and suppositories. Physical therapy also plays a role in the conservative treatment of pelvic pain, with focus on training of pelvic floor muscles (13).

When patients do not respond to medical treatment, introduction to more invasive treatments of pain control may be appropriate. Traditionally, this includes intrathecal pumps, spinal cord stimulators, and sacral neuromodulators (14). While these devices have the potential to provide long-term pain relief, patients may be hesitant to undergo surgery and commit to implantation of a foreign device, many of which are not MRI compatible. Outpatient nerve and sympathetic blocks provide a minimally invasive option for this set of

patients. Literature on regional blocks for the treatment of MS pain is limited, with much of the discussion revolving around perioperative nerve blocks and the concern regarding peripheral nerve injury in a population with existing neurologic compromise. Although MS is a disease of the central nervous system, patients may have subclinical peripheral nerve involvement, with abnormal nerve conduction studies seen in approximately 30% of patients (15). Although no guidelines nor recommendations currently exist, regional anesthetic techniques are not contraindicated in patients with MS based on available evidence, and its use is left to the judgment of the medical provider based on thorough evaluation of the patient's existing neurologic deficits (16).

The ganglion impar block has the potential to provide patient relief from visceral pelvic pain. The ganglion impar, also known as the ganglion of Walther, is the terminal ganglion of the 2 paravertebral sympathetic chains and is located just anterior to the sacrococcygeal junction (17). It acts as the convergence point of afferent nerves from the perineum, distal anus, distal rectum, urethra, vulva, and distal vagina (18).

There are several approaches to the ganglion impar block, including the use of curved or bent spinal needles through the anococcygeal ligament, but fluoroscopic guidance has allowed for easier trans-coccygeal and trans-sacrococcygeal techniques. The patient is placed prone, and the lateral fluoroscopic view is used to identify the sacrococcygeal junction, the first or second intercoccygeal junctions. The skin is anesthetized, and a 22G or 25G needle is advanced through the sacrococcygeal ligament (or intercoccygeal ligament) under fluoroscopic guidance until the tip sits just anterior to the coccyx bone. Contrast is injected to verify the retroperitoneal location, commonly seen as a "comma sign" under fluoroscopy. Once the position is verified, a local anesthetic with or without a steroid can then be injected. If a successful block is achieved, with success determined to be at least a 50% relief of pain following injection, subsequent blocks can be performed or an ablative technique may be considered.

Either conventional or pulsed radiofrequency ablation can be considered as the primary ablative method. There are benefits as well as detriments to both. With conventional radiofrequency ablation, heat is used to produce a lesion to disrupt pain signals; however, this thermal energy can also cause injury to surrounding structures. With pulse radiofrequency ablation, the temperature is typically not raised beyond 42°C; however, a longer duration of ablation may be required to achieve an adequate lesion size. For the patient in Case 2, we chose to use a short period of time with conventional radiofrequency ablation to avoid an increase in temperature of surrounding tissues and to decrease the risk of bowel injury. We also implemented a pulsed radiofrequency ablation method to achieve an adequate lesion size with an increase in ablation time without the increase in temperature.

While the ganglion impar block is generally safe and well-tolerated, there may be some rare adverse effects such as motor, sexual, bladder, and bowel dysfunction, perforation of the rectum and sciatic nerve impingement, and infection. Conventional radiofrequency ablation is commonly associated with pain during the procedure, but only rarely results in neuritis, deafferentation pain, motor deficit, allodynia, or dysesthesia. In comparison, pulsed radiofrequency ablation is a more novel technique that is also effective for pain relief in chronic perineal pain of nononcological origin, but its only known complication is infection at the site of skin puncture.

The rate of success with treating pelvic pain in MS patients with the ganglion impar block is unknown, as no efficacy studies currently exist targeting this patient population. An observational study of 16 patients with non-MS-related, chronic perineal pain by Toshniwal showed that all patients had a 50% pain reduction after the injection and all patients had reduced pain scores at 2-month follow-up (19). A retrospective pilot study of 22 patients with coccygodynia by Gunduz achieved at least 50% pain relief in 82% of patients, with relief lasting a median of 6 months (20). Further studies for the treatment of MS-related pelvic pain would be necessary to determine efficacy.

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