A Novel Collaborative Protocol for Successful Management of Penile Pain Mediated by Radiculitis of Sacral Spinal Nerve Roots From Tarlov Cysts

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ABSTRACT

Introduction: Since 14 years of age, the patient had experienced extreme penile pain within seconds of initial sexual arousal through masturbation. Penile pain was so severe that he rarely proceeded to orgasm or ejaculation. After 7 years of undergoing multiple unsuccessful treatments, he was concerned for his long-term mental health and for his future ability to have relationships.

Aim: To describe a novel collaboration among specialists in sexual medicine, neurophysiology, and spine surgery that led to successful management.

Methods: Collaborating health care providers conferred with the referring physician, patient, and parents and included a review of all medical records.

Main Outcome Measure: Elimination of postpubertal intense penile pain during sexual arousal.

Results: The patient presented to our sexual medicine facility at 21 years of age. The sexual medicine physician identifying the sexual health complaint noted a pelvic magnetic resonance imaging report of an incidental sacral Tarlov cyst. A subsequent sacral magnetic resonance image showed four sacral Tarlov cysts, with the largest measuring 18 mm. Neuro-genital testing result were abnormal. The neurophysiologist hypothesized the patient's pain at erection was produced by Tarlov cyst-induced neuropathic irritation of sensory fibers that course within the pelvic nerve. The spine surgeon directed a diagnostic injection of bupivacaine to the sacral nerve roots and subsequently morphine to the conus medullaris of the spinal cord. The bupivacaine produced general penile numbness; the morphine selectively decreased penile pain symptoms during sexual arousal without blocking penile skin sensation. The collaboration among specialties led to the conclusion that the Tarlov cysts were pathophysiologically mediating the penile pain symptoms during arousal. Long-term follow-up after surgical repair showed complete symptom elimination at 18 months after treatment.

Conclusion: This case provides evidence that (i) Tarlov cysts can cause sacral spinal nerve root radiculitis through sensory pelvic nerve and (ii) there are management benefits from collaboration among sexual medicine, neurophysiology, and spine surgery subspecialties. **Goldstein I, Komisaruk BR, Rubin RS, et al. A Novel Collaborative Protocol for Successful Management of Penile Pain Mediated by Radiculitis of Sacral Spinal Nerve Roots From Tarlov Cysts. Sex Med 2017;X:XXX–XXX.**

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Key Words: Tarlov Cyst; Neurogenic Sexual Dysfunction; Penile Pain; Radiculitis of Sacral Spinal Nerve Root

INTRODUCTION

Male genital organs, including the penis, corpora cavernosa, corpus spongiosum, pelvic floor muscles, prostate, and scrotum, are innervated in part by the afferent (sensory) and efferent (motor) components of the pudendal somatic, pelvic, and hypogastric autonomic nerves.[1–3]

Injuries and neuropathies of the somatic and/or autonomic genital nerves can occur in the following well-described and well-recognized conditions: post-radical prostatectomy, multiple sclerosis, diabetes mellitus, traumatic pudendal neuropathy, and spinal cord injury.[4–7] Such injuries and neuropathies to the

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critical somatic and autonomic genital nerves could hypothetically irritate and/or block genital nerve function, which, depending on their location, intensity, and chronicity, can result in different distressing sexual health concerns.

Injuries and neuropathies of the somatic and/or autonomic genital nerves also can occur from less well-described and less well-recognized conditions. For example, in the sacral and lumbar spine regions, sacral spinal nerve roots are subject to compression or impingement radiculopathies from pathologies such as sacral spinal meningeal cysts (eg, Tarlov cysts), disc impingements, annular tears, facet (spinal synovial) cysts, and spinal stenosis.[8–11]

Should these sacral spinal nerve roots become compressed and/or irritated, neurologic sexual dysfunctions secondary to radiculopathy of the sacral spinal nerve roots can be realized.[8] Of critical importance, and having a uniquely different prognosis from such conditions as post-radical prostatectomy or diabetes mellitus, sacral spinal nerve root compression injuries and neuropathies are potentially reversible by spine surgery.[12]

This case report highlights evidence that Tarlov cysts can pathophysiologically produce the extremely distressing sexual health concern of painful penile genital neuropathy induced by sexual arousal. Previously, Tarlov cysts have been linked to cases of persistent genital arousal disorder (PGAD) in women.[8,12] This case report also emphasizes the management benefits of a collaborative association among experts in three disciplines: sexual medicine, neurophysiology, and spine surgery. Such an association was used to successfully manage this young patient who presented to our sexual medicine clinic with a 7-year history of severe, distressing penile pain that commenced within seconds of starting masturbation.

CASE REPORT

The patient reported that the condition started when he was 14 years old, before his beginning masturbation, when he would awaken once or twice per month with painful erections without nocturnal emissions. He subsequently noted that within seconds of starting masturbation, he repeatedly experienced severe penile pain that was so intense that it prevented him on almost all occasions from proceeding to orgasm. He perceived the pain exclusively in the penile shaft, not in the glans penis or surrounding genitalia (ie, testes, scrotum, perineum, pelvic floor muscles, anus, or prostate). Voluntary pelvic floor contraction was not painful. Voiding and defecation did not elicit pain. The intense pain ceased within seconds after terminating erect penile stimulation. With the onset of infrequent nocturnal erections, the intense pain of his penis would wake him up. Although he almost never experienced a sexually induced orgasm, on those rare occasions when he did, he reported that even the passage of ejaculate fluid through the urethra was painful. He also experienced urinary urgency and complained of restless legs.

The patient experienced two possibly relevant etiologic episodes of trauma: when he fell down the stairs at 8 months of age and when he fell onto, straddling, the metal bar of the "monkey bars" at 7 years of age, injuring his perineal and coccygeal areas.

After presenting with symptoms at 14 years of age, the patient and his very supportive parents, strong advocates in communicating with the various physicians, sought medical assessments during the next 7 years. During his adolescent years, he was managed by specialists in chiropractic medicine, urology, neurology, pain medicine, physical medicine and rehabilitation, pelvic floor physical therapy, sexual medicine, psychiatry, and sex therapy with cognitive behavior therapy. Based on numerous careful physical examinations, ultrasound, and magnetic resonance imaging (MRI) studies, there was no evidence of tender Peyronie disease plaques; no apparent prostate, pelvic, scrotal, abdominal, or inguinal pathology; no tethered spinal cord or bladder or bowel pathology; and no evidence of a sexually transmitted infection; also normal were endocrine function, including testosterone, and non-hormonal blood test results. One pain specialist admitted to "no answers, no suggestions, and no tests that can be done." From multiple physicians over the years, the patient was prescribed the following medications, none of which alleviated the complaint of pain after initiation of penile erection by masturbation: pregabalin, lorazepam, paroxetine, nortriptyline, diazepam, doxazosin, acetaminophen, acetaminophen with codeine, a eutectic mixture of lidocaine 2.5% and prilocaine 2.5%, and botulinum toxin type A injected into the bulbospongiosus muscles. On separate occasions with different specialists, he received a dorsal nerve block and pudendal nerve blocks with local steroid triamcinolone peripherally in the perineum and at the Alcock canal. All these invasive procedures failed to block his symptom of intense penile pain at masturbation. In an additional procedure, lidocaine subcutaneously around the neurovascular bundle blocked not only the pain but also all penile sensibility, producing penile numbness and a lack of erection.

The penile pain with sexual stimulation discouraged him from initiating sexual relationships. He began to struggle emotionally at 19 years of age when he went to college. A sexual medicine psychiatrist assessed him and judged he did not present as overly anxious or histrionic in any way, but the clinician was concerned about emerging anxiety and depression as the young man came to the realization that this condition was not going to resolve naturally with time. The psychiatrist did not find sufficient psychiatric pathology to account for his pain. The patient's consultations with medical experts continued with the support of his parents.

At 21 years of age, after 7 years of examinations, he sought an opinion at a sexual medicine facility. His baseline sexual function questionnaire data were noted (Table 1). Included in the medical records was a pelvic MRI and a prostate MRI radiology report noting the presence of a Tarlov cyst on S2, listed as "incidental" (Figure 1). A sacral MRI, which can better detect spinal pathology not visible on a pelvic MRI, was obtained with T2

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