



CASE STUDY

Pudendal nerve entrapment in a bareback rodeo cowboy: A case study

Mark R. Lafave^{a,*}, Bonnie Sutter^b

^a Mount Royal University, 4825 Mount Royal Gate SW, Calgary, AB T3E 6K6, Canada

^b University of Calgary, 2500 University Dr. NW, Calgary, AB T2N 1N4, Canada

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KEYWORDS

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Retrovesical pouch;
Perineal pain

Abstract The case of a 31 year-old bareback rodeo cowboy who suffered from pelvic floor pain and spasm is presented. The clinical care pathway for this case was not simple and in fact, misdiagnosed for months prior to seeking the care of an osteopathic manual therapist. The pelvic floor muscle spasm was presumably caused by pudendal nerve entrapment even though there were no diagnostic tests such as EMG to confirm it. The entrapment was thought to be from the abdominal viscera (mesentery and sigmoid colon) being adhered to peritoneal tissue in the small pelvis. Treatment consisted of four consecutive days of osteopathic manual therapy treatment due to special patient availability and circumstances. The treatment focused on a release of the root of the mesentery and ischial intraosseous lesions, the release of the sigmoid colon from posterior abdominal wall and iliopsoas muscle, myofascial release of the thoraco-lumbar fascia, and myofascial release of pelvic floor musculature including balancing of three diaphragms, and harmonizing the primary respiratory mechanism within the cranial-sacral system. The etiology is thought to occur due to the sport's natural ptosis forces on the viscera. The patient returned to bareback riding without any issue and on follow-up five years later, did not report any symptoms.

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Background

A 31 year-old, male professional bareback rider (patient herein) first presented to a certified athletic therapist (the primary author – ML) with pelvis and back pain at a national rodeo event

* Corresponding author. Tel.: +1 403 440 6246; fax: +1 403 440 6744.

E-mail addresses: mlafave@mtroyal.ca (M.R. Lafave), bsutter@ucalgary.ca (B. Sutter).

in November, 2006. The patient described an insidious onset of symptoms that slowly intensified from July 2006 to November 2006, and further grew into greater pain and debilitation during the national event. The clinical care pathway for this patient was complicated, involved many practitioners and ended well with the assistance of an osteopathic manual therapist. This case study will outline, chronologically, the successful and unsuccessful treatment that transpired over a five-year period between November 2006 and November, 2011. The literature for this type of diagnosis and injury will also be reviewed. The patient consented to sharing information about his case in this paper.

Clinical features, November 2006

The patient presented to a certified athletic therapist after the first bareback ride at the national event in November, 2006 with intense pain and spasm in his low back and pelvis. The patient described no problems while riding bareback horses (which is quite a vigorous and physically demanding sport), but rather upon the dismount from the horse. When the patient dismounted the horse, there was an intense perineal spasm that traveled upwards to the pelvis and lower back. The spasm peaked shortly after the patient dismounted the horse and it took 10 min to walk a short distance out of the rodeo arena. The clinical history revealed an insidious onset over the previous four months.

Physical examination by the athletic therapist revealed pelvic malalignment (left upslip and sacral torsion). There was significant hypermobility in the symphysis pubis joint with mechanical dysfunction at the sacroiliac joints and lumbar spine. There was acute treatment of the pain and spasm with ice, massage, tape, muscle energy and, chiropractic adjustments over the course of the 5 days of the national event as an attempt to permit him to continue to ride. Treatment only provided symptomatic relief as the perineal and pelvic spasm returned after every ride. The patient was advised by the athletic therapist and chiropractor to go home and rest for 6 weeks to permit his pelvis to heal.

Clinical features, January 2007

The patient was reviewed by a sport medicine physician and he concurred with the athletic therapist that the patient's pelvis was unstable, but had no medical solutions to offer other than rest and exercise. The patient was treated by the athletic

therapist with massage, myofascial release and muscle energy that seemed to correct any malalignment temporarily. The patient was prescribed strengthening exercises to improve his core stability: Kegel exercises¹; gluteus maximus exercises; hamstring curls; groin exercises; abdominal curls; and leg press exercises. The patient was also taught how to perform stretches on the piriformis, quadriceps, groin and hamstring muscles. The patient lived 2 h from any major center, so all of the exercises were to be done as part of a home program. The patient returned for a clinical visit to an athletic therapist every two weeks, was re-evaluated, treated with manual therapy and returned home. After six weeks of this treatment, the patient decided to test his riding ability on a mechanical device that simulated a bucking horse. There were no symptoms or ill effects from this practice event. The patient went on to ride a practice horse that bucked just like one from a real competition. The same symptoms described above came back immediately. At this time, the treating athletic therapist knew that the course of treatment had failed and alternatives must be sought out. A Canadian trained osteopathic manual therapist was asked by the athletic therapist to consult with the patient at this time, but the patient thought the history questions and treatment seemed too "voodoo like" and was more comfortable with mainstream medical professionals at this time.

Clinical features, March 2007

A new sport medicine physician prescribed a somewhat radical concept to help diagnose the problem at this time. The physician predicted the instability in the patient's left sacroiliac joint (SI) contributed to the pelvic floor spasm triggered from pain fibers innervating the SI joint. The physician prescribed fluoroscopic freezing of the SI joint with a Marcaine injection to determine if the pelvic floor pain and muscle spasm was the result of referred pain from the SI joint. The patient rode a bucking horse within 30 min of being injected. The spasm returned after the bareback ride exactly the same way it had done in the past. The sport medicine physician proposed no other treatment options and encouraged the patient to seek alternative care.

Clinical features, April 2007

The patient consulted three additional medical physicians in the United States of America, with no

concrete diagnosis offered. One physician provisionally diagnosed the complaint as a "sports hernia." Another option provided by a surgeon was to fuse both sacroiliac joints, however the patient refused this course of treatment and returned home to Canada.

Clinical features, May & June 2007

The patient continued to search for other practitioners who could help over these two months including naturopathic physicians, acupuncturists, chiropractors, massage therapists, healing hands specialists and, physiotherapists to name a few. In the patient's words, "they all thought they knew what the problem was, but not one of them actually fixed it." From January to June, 2007, the patient continued the exercise regime originally prescribed by the athletic therapist who first saw him. The patient reported feeling marginally better after bareback riding during this time because the spasm was not as intense as when he originally presented in November, 2006. However, it was clearly not 100% better. The patient continued to ride despite the spasm until July, 2007.

Clinical features, July 2007

The patient was invited to a very large, lucrative and prestigious invitation-only rodeo event. In order to be successful in this event, riders need to score and ride well five days in a row. The patient sought out osteopathic manual therapy (from the author BS) for evaluation and treatment. The following outlines the subjective, objective, assessment and plan (i.e. SOAP notes) for this patient:

Subjective

- Complaint of intense and debilitating perineal (pelvic floor) pain and spasm that began at the perineal body (just posterior to the scrotum) and traveled in a posterior and cephalad direction to the left sacroiliac joint
- The intense and debilitating spasm and pain dissipated after 10 min making the residual pain manageable
- Denial of any penile or testicular pain
- Denial of any bowel/bladder dysfunction
- The patient was severely frustrated and questioning if retirement from the sport was necessary

Objective

- Bilateral pelvic floor muscle spasm
- Sacrotuberous and sacrospinous ligament tension on the left side²
- Bilaterally flexed sacrum³
- L5-S1 hypomobility
- Group somatic dysfunction between T11-L1³
- Ischial bursa thickening and tenderness greater on the left than the right
- Hamstring flexibility as determined by a straight leg raise was reduced by 20° on the left side relative to the right side
- Intraosseous lesion of the ischial tuberosity, left greater than right⁴
- Increased tension and pain on the coccyx upon palpation⁵
- Lumbar spine was tensioned into lordosis
- Root of the mesentery was sheared inferior due to the mesentery adhesion to the retrovesical pouch⁵
- Thoraco-lumbar fascia tension⁵
- The Sigmoid colon was adhered to the left hip flexor
- The pubic tubercles and sacrum were compressed

Assessment

- Pelvic floor muscle spasm due to pudendal nerve entrapment thought to be due to compression superiorly from the mesentery and sigmoid colon lesions and inferiorly due to the hamstrings and ischial bursitis, and ischial intraosseous lesion

Plan (between July 2007 and November 2011)

The patient was treated on 4 consecutive days in July, 2007 with myofascial release, osteo-articular mobilization, cranial and visceral release techniques. It is unusual to treat osteopathically on consecutive days. However, due to the patient's sport, the urgent need to compete and remoteness of his home base, it was decided the patient and the osteopathic manual therapist would monitor his symptoms to determine the course and length of daily treatment. The first day primarily focused on a release of the root of the mesentery and ischial intraosseous lesions. When the patient returned the next day, there was a 50% improvement of the patient's symptoms. The second day focused on the

release of the sigmoid colon from posterior abdominal wall and iliopsoas muscle. Further, a thoracolumbar fascia release was completed on the second day.⁵ There was an additional 25% improvement of the patient's symptoms on the third day. The third day of treatment focused on a release of pelvic floor musculature including balancing of the three diaphragms, and harmonizing the primary respiratory mechanism within the cranio-sacral system.² The final treatment consisted of: 1) a re-evaluation and treatment of the previous day's treatments to improve the mobility in the pelvic girdle and viscera; 2) normalization of the remnant cranio-sacral and spinal lesions. The patient felt no pain or other symptoms after the fourth day of treatment.

The patient was advised to continue with the stretching and strengthening previously prescribed by the athletic therapist. The patient was instructed to use an inversion traction unit to counterbalance the sport's natural ptosis forces on the viscera. He was instructed to invert on the table to 45° from the horizontal for 30–60 s at a time 3 times per day, every day. The patient returned for treatment one year later (July, 2008) with reduced symptoms as previously described, was treated in a similar fashion and did not return for another year. The patient returned again in July, 2009 with similar, but less severe symptoms, was treated and has not returned for treatment. In November, 2011, the patient was contacted to ascertain the health status of their pelvis and low back. The patient reported no signs or symptoms since the last treatment in July, 2009.

Review of literature

The pudendal nerve arises from the sacral plexus at the S2-S4 levels. It has multiple functions including motor (20%), sensory (50%) and autonomic (30%).^{6,7} The pudendal nerve separates into its three branches around the Alcock's Canal: inferior rectal nerve; perineal nerve and; the dorsal nerve of the penis/clitoris. Each aspect of the nerve may have sensory, motor or autonomic function.⁷

Pudendal nerve entrapment has been reported in activities such as an ironman athlete,⁶ a water-polo player,⁸ stationary biker,⁹ and cycling,¹⁰ but never reported with rodeo cowboys. This condition is more commonly reported in females (two thirds) than males.¹¹ Most options for treatment have been surgical whereby the pudendal nerve is freed from the regions where it may be commonly be entrapped.^{7,11,12} There have been three¹¹ or four¹² sites proposed for the pudendal nerve entrapment:

1) anterior to the piriformis muscle; 2) between the sacrotuberous and sacrospinous ligaments at the ischial spine; 3) the fascia medial to the obturator internus muscle (Alcock's Canal) and; 4) distal branches of the pudendal nerve as they exit from the Alcock's Canal. Clinical presentation varies based on where the nerve is entrapped.

The etiology described in most cases has been trauma,⁸ repetitive sitting on a bicycle seat^{6,9,10} or gynecological issues from childbirth.¹³ In the case study presented here, the mechanism of injury appeared to be entrapment of the pudendal nerve between the sacrospinous and sacrotuberous ligaments at the ischial spine or in the Alcock's Canal. The entrapment due to pressure from abdominal viscera is thought to be due to the nature and demands of bareback riding itself.

Bareback riding is second only to bull-riding for injury rates in all rodeo events.¹⁴ Bareback riders have a 24.5/1000 competitive exposure chance of injury in this event.¹⁴ There are no published injury rates specific to the pelvic body region currently. Bareback riding is a rodeo event whereby cowboys lean back (supine) and ride a saddle-less horse that is bred to buck when there is a person is on its back.¹⁵ The cowboy wedges their hand into a leather rigging tied onto the upper spine of the horse just above its mane. Cowboys are judged based on their ability to flex their hips followed by a reaching and kicking motion with their feet (spurring forward) with each jump/kick from the horse. The cowboy leans back, but as they flex and extend their hips, their spine also flexes and extends at the lumbopelvic junction. Each jump of the horse produces tremendous axial (caudad to cephalad and vice versa) forces. The objective is to ride and be judged on spurring technique for 8 s.

The etiology of the pudendal nerve entrapment was due to the mesentery (and its root) and sigmoid colon shearing inferiorly to the retro-vesical pouch due the biomechanics of riding bucking horses. Part of the rationale for the diagnosis of pudendal nerve entrapment etiology is based on the patient's rapid and successful response to visceral and soft tissue treatment over the four-day period. The other aspect responsible for the diagnosis was the pain and perineal spasm that occurred after each ride.

Conclusions

The incidence of pelvic-related injury in bareback riders is not known. Considering the multitude of

differential diagnoses for pudendal nerve entrapment and the vast array of failed treatments, this diagnosis should have greater attention. It should be pointed out that a number of mainstream medical practitioners were unable to help this patient and it was not until an alternative medicine healthcare provider diagnosed and treated the condition that this patient improved. There have been a number of cases where surgical intervention for this condition has led to both success and failure.^{9,11,12,16} However, there are two cases (in addition to this one) that have documented success with conservative treatment.^{6,8} Arguably, if patients could be treated conservatively with success, then inherent risks of surgery or other invasive treatments could be avoided. Future research should capture the diagnostic criteria (history and physical examination) for entrapment of the pudendal nerve, and this would permit a greater understanding of the etiology, underlying pathology and, ultimately, the best course of treatment. Finally, patient-practitioner trust is essential for successful diagnosis and treatment this condition due to the sensitive nature of this injury.

Author contribution statement

The concept of a case study paper for this patient was discussed, conceived and written by both authors. Both authors acted as a practitioner for this patient and thus, both bring a different perspective to the paper from their respective professional experiences and background. Mark Lafave is an athletic therapist and thus, treated with skills of an athletic therapist. He wrote the section where the treatment was rendered by the athletic therapist. Bonnie Sutter is both an athletic therapist and an osteopath (manual practitioner) and thus, wrote the sections from that perspective. Both authors wrote the other common sections together including the introduction, review of literature and conclusions. The entire

paper was truly a collaborative effort with both authors.

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