CASE REPORT

Chronic visceral pain secondary to ventral disc herniation: Development of visceral complex regional pain syndrome

Gabriela Rocha Lauretti, Raquel de Oliveira[1]

Departments of Biomechanics Medicine and Rehabilitation of Locomotor Members, [1]Teaching Hospital, School of Medicine of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

Address for correspondence:
Prof. Gabriela Rocha Lauretti,
Rua Maestro Joaquim Rangel, 644,
CEP 14025-610, Ribeirão Preto,
São Paulo, Brazil.
E-mail: grlauret@fmrp.usp.br

ABSTRACT

When an organ disease is ruled out as the origin of pelvic pain, the superior hypogastric plexus (SHP) injury and consequent dysfunction could be the mechanism of visceral chronic pain perpetuation. As much as a dorsal discus herniation may harm the dorsal or ventral roots, a ventral discus herniation at L4-L5 or L5-S1 may result in direct physical trauma to the SHP, maintaining chronic visceral pain mediated by sympathetic dysfunction, conceivably also afferent fibers dysfunction. We propose that similarly to nociceptive somatic dysfunction named complex regional pain syndrome, the maintained sympathetic pelvic pain secondary to straight physical damage to the SHP characterize in fact the same disease, but in nociceptive visceral tissue, named visceral complex regional pain syndrome, a concept constructed based on the International Association for the Study of Pain criteria (1994).

Key words: *Complex regional pain syndrome, ventral herniation, visceral pain*

INTRODUCTION

When an organ disease is ruled out as the origin of pelvic pain, other causes including injury of the sensory afferent or the sympathetic efferent fibers of the viscera should be taking into account. These fibers engage together to consist the superior hypogastric plexus (SHP), responsible for the innervation of pelvic viscera[1] and lye in front of the lumbar discus, emerging the possibility of secondary SHP dysfunction due to ventral discogenic herniation. It is described and discussed five cases of patients suffering from long lasting chronic pelvic pain, which was credited to be secondary to ventral lumbar disc herniation and introduced the new concept of visceral complex regional pain syndrome, built based on the International Association for the Study of Pain (IASP) criteria.[2]

CASE REPORTS

The Ethics Committee of the Teaching Hospital approved the study protocol (HC-FMRP-USP n°. 1430/2010) and patients gave written informed consent. Table 1 describes five patients with chronic pelvic pain. The spine magnetic resonance imaging (MRI) had obvious anterior disc protrusion and high signal intensity anterior to the disc protrusion on MRI (Time 2; Window 1-T2W1). All patients met the inclusion criteria: Pelvic pain for more than 6 months, anterior lumbar disc herniation, high signal intensity anterior to the disc protrusion on MRI (T2W1) and positive result secondary to SHP test block [Table 2]. Exclusion criteria were structural abdominal diseases, untreated coagulopathy, unstable medical illness, neuropathy secondary to diabetes, viral neuropathy, alcohol neuropathy or cognitive impairment that precluded an accurate response assessment.

Patient 1-Male, history of disturbing pelvic pain associated to upper right abdominal pain. Thoracic and lumbo-sacral magnetic resonance revealed ventral discus herniation at thoracic T11-T12 and lumbar L4-L5 levels. Patient was submitted to L3, L4, and L5 sympathetic test block [Figure 1], which evidenced a ventral discus extrusion deriving from L4 to L5, accommodating over the ventral face of the L5 lumbar disc [Figure 2]. Patient had relief from pelvic pain after sympathetic test block combined to SHP test block, and from upper abdominal right pain from right splanchnic test block at T11 and T12. After 5 months, as pain gradually returned, he was submitted to radiofrequency ablation.

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Patient 2-Female, disabling pelvic pain that got worst at sexual intercourse. Lumbar MR revealed a ventral discogenic herniation at L5-sacral S1. She was submitted to SHP test block and was pain free from pelvic pain. After 7 months, she was submitted to RF ablation of SHP. She is still comfortable after 4 years evaluation.

Patient 3-Female, worsening pelvic pain associated to right upper abdominal pain. Thoracic and lumbo-sacral magnetic resonance revealed obvious ventral discus herniations at T11-T12 and L5-S1 levels. Patient had relief from pelvic pain after SHP test block, and from upper abdominal right pain from right splanchnic test block at T11 and T12. She is still pain-free in 9 months evaluation.

Patient 4-Female, suffered from pelvic and perineal pain, married with no sexual intercourse for the past 3 years and under psychiatric supervision. Magnetic resonance revealed protruded ventral disc herniation at L5-S1 and sacral cysts. She was submitted to SHP block combined to impar block. Sacral cysts puncture at left foramina S2 and S3 was performed under fluoroscopy. She is still pain-free for the past 2 years evaluation.

Table 1: Patients description and demographic data

Gender	Weight (kg)	Height (cm)	Age (year)	Race	Religion	Time of chronic pelvic pain (years)	Other comorbidities	Drugs used	Interference in sexual intercourse	Marital status
Male	105	178	57	White	Catholic	7	Obesity, hypercholesterolemia, hypertension, right upper abdominal pain	Venlafaxine, metamizol, NSAIs, paracetamol, codein, tramadol, oxycontin, gabapentin	Difficulty of erection	Married
Female	64	156	62	White	Catholic	6	Depression, low back pain	Venlafaxine, metamizol, codein, tramadol, butyl-scopolamine	Increased pain	Married
Female	73	164	54	White	Catholic	2	Right upper abdominal pain	Butyl-scopolamine, metamizol, codein, tramadol, NSAIs	No complains	Married
Female	62	161	60	White	Catholic	4	Depression Perineal pain	Nortriptilyne, pregabalin, gabapentin, tramadol, bupropion, NSAIs	Last sexual intercourse 3 years ago due to pain	Married
Female	64	153	72	White	Catholic	8	Low back pain Shoulder arthrosis	Amitriptyline, NSAIs metamizol, paracetamol, codein, tramadol	No sexual intercourse	Single

NSAIs: Nonsteroidal anti-inflammatory drugs

Table 2: Case conduction

VAS (cm)	Test blocks done at once	Conduction	Pain improvement (%)	Actual oral medication
10	L3, L4, L5 sympathetic test block to localize the ventral herniation compression to the SHP followed by the SHP test block, right splanchnic test block at T11 and T12 (2.5 ml volume at each site). Completion to 10-ml volume just at the SHP block	RF of L4, L5 sympathetic, HSP and T11 and T12 right splanchnic nerves	95	Bupropion
10	SHP test block (2.5 ml volume, >50% improvement in pain), completion to final 10 ml volume	RF of SHP and bilateral lumbar medium branches of L3-L5	90	Venlafaxine
8	SHP test block (2.5 ml lidocaine volume, >50% improvement in pain, completion to final 10 ml volume), right splanchnic test block at T11 and T12 (2.5 ml volume at each site, >50% improvement in pain)	Still pain-free for 9 months	100	Bupropion
10	SHP test block (2.5 ml volume, >50% improvement in pain, completion to final 10 ml volume) (3 times) Impar test block (2.5 ml lidocaine volume, >50% improvement in pain), completion to final 5 ml volume), sacral cysts puncture	Still pain free for 2 years	100	Nortriptyline, gabapentin, bupropion
8	SHP block (2.5 ml volume, >50% improvement in pain), completion to final 10 ml volume); laser ablation of L4-L5 intervertebral discus	Still pain free for 12 months	100	Amitriptyline, metamizol

VAS: Visual analogue scale; SHP: Superior hypogastric plexus; RF: Radiofrequency; HSP: Hypograstric sympathetic plexus

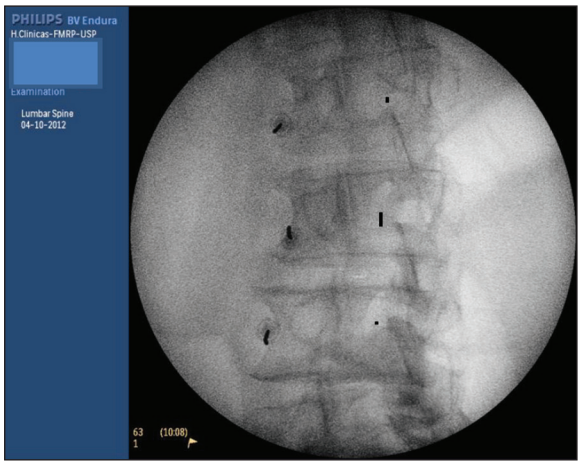

Figure 1: Oblique vision of lumbar (L) vertebral bodies, demonstrating the tunnel vision for the needle positioning for sympathetic ganglion block at L3, L4 and L5

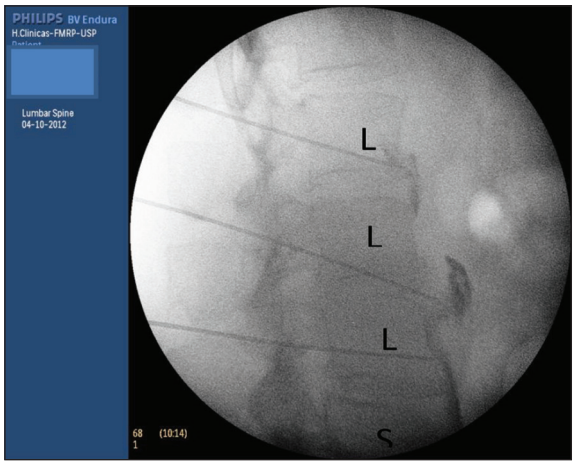

Figure 2: Lateral vision of ventral discus extrusion deriving from lumbar L4-L5, accommodating over the ventral face of the L5 lumbar disc, where superior hypogastric plexus lyes

Patient 5-Female, suffered from pelvic pain, single, no history of sexual intercourse. Magnetic resonance revealed big protruded ventral disc herniation at L4-L5 lumbar discus. She was submitted to SHP block with complete but not long lasting pain relief. Three months later she was submitted to L4-L5 discectomy by laser ablation (3 cycles of 400 joules, with 1 min interval between cycles (Medlaser, AVR Surgical). She is still very comfortable after 12 months evaluation.

DISCUSSION

This discussion focus on the importance of the consideration of the spine en block, including its ventral and dorsal regions. When pain is characterized as nociceptive somatic, the dorsal region of the spine should be carefully evaluated. However, visceral and sympathetic pain refer us to the ventral aspect of the vertebral bodies at the medium-lower thoracic, lumbar and sacral regions.

Because of its site of localization just anterior aspect of the vertebrae L5-S1 bodies, a herniation could harm the cellular body of the sympathetic postganglionic neuron when it synapses with the efferent sympathetic preneuron;[3] and it has been proposed the possibility of intact preganglionic axons sprouting collaterals to supply denervated ganglion cells.[4] As a consequence, chronic pelvic pain can become self-perpetuating, and now comes a question whether visceral chronic pain secondary to discogenic herniation and sympathetic hyperactivity could be classified as complex regional pain syndrome, based on the IASP criteria defined in 1994.[2]

As part of our protocol, all patients were firstly submitted to central neuraxial block [Table 2] aiming to central desensitization.[5] Clinical observation reveals that both peripheral and central mechanisms are involved in the generation and maintenance of cross-viscera sensitization and hypersensitivity.[6] Mechanisms underlying visceral hypersensitivity may include sensitization of afferent neurons and sympathetic efferent fibers (peripheral sensitization) and sensitization of spinal cord dorsal horn neurons.[7] Another important mechanism is wind-up, a form of homosynaptic activity-dependent plasticity characterized by a progressive increase in action potential output from dorsal horn neurons. The amplification process could also be aided by alterations in spinal or supraspinal glial-neuronal relations.[8] Among peripheral mechanisms, N-methyl-D-aspartate receptors were demonstrated to be expressed on the cell bodies and peripheral terminals of the primary afferent nerves innervating the colon.[9] In addition, peripheral inflammation activates microglia in the spinal cord that release proinflammatory cytokines[10] and can influence the excitability of central neurons.

As conclusions, the ventral part of the spine should be carefully evaluated looking for any reasons for HSP harm and dysfunction, such as ventral L4-L5-S1 discus intervertebralis herniation. Because visceral nociceptive tissue can, as much the somatic nociceptive tissue, suffer from secondary nervous tissue damage with consequent afferent C and Ad-fibers and efferent sympathetic dysfunction, it equally could be classified as complex regional pain syndrome of the visceral tissue, or visceral complex regional pain syndrome.

REFERENCES

1. Plancarte R, de Leon-Casasola OA, El-Helaly M, Allende S, Lema MJ. Neurolytic superior hypogastric plexus block for chronic pelvic pain associated with cancer. Reg Anesth 1997;22:562-8.

2. Reinders MF, Geertzen JH, Dijkstra PU. Complex regional pain syndrome type I: Use of the International Association for the Study of Pain diagnostic criteria defined in 1994. Clin J Pain 2002;18:207-15.
3. Zaitouna M, Alsaid B, Diallo D, Benoit G, Bessede T. Identification of the origin of adrenergic and cholinergic nerve fibers within the superior hypogastric plexus of the human fetus. J Anat 2013;223:14-21.
4. Kepper ME, Keast JR. Specific targeting of ganglion cell sprouts provides an additional mechanism for restoring peripheral motor circuits in pelvic ganglia after spinal nerve damage. J Neurosci 1998;18:7987-95.
5. Mishra S, Bhatnagar S, Rana SP, Khurana D, Thulkar S. Efficacy of the anterior ultrasound-guided superior hypogastric plexus neurolysis in pelvic cancer pain in advanced gynecological cancer patients. Pain Med 2013;14:837-42.
6. Brumovsky PR, Gebhart GF. Visceral organ cross-sensitization — An integrated perspective. Auton Neurosci 2010;153:106-15.
7. Anand P, Aziz Q, Willert R, van Oudenhove L. Peripheral and central mechanisms of visceral sensitization in man. Neurogastroenterol Motil 2007;19:29-46.
8. Aziz Q, Botha C, Willert R. Pharmacology of visceral pain: Central factors. Dig Dis 2009;27 Suppl 1:31-41.
9. McRoberts JA, Coutinho SV, Marvizón JC, Grady EF, Tognetto M, Sengupta JN, *et al.* Role of peripheral N-methyl-D-aspartate (NMDA) receptors in visceral nociception in rats. Gastroenterology 2001;120:1737-48.
10. Milligan ED, Watkins LR. Pathological and protective roles of glia in chronic pain. Nat Rev Neurosci 2009;10:23-36.

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