

Interligamental Pudendal Neuropathies: Anatomical and Clinical Aspects

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Abstract

Among the diseases of the pudendal nerve, compression lesions are the most frequent - pinching in anatomically shaped canals (“traps”, “tunnels”) - tunnel syndromes. The statistics indicate the leading place in the frequency of compressions between the strained sacrospinous and the sacrotuberous ligaments - interligamentous pudendal neuropathy. Pathological tension of the ligaments (often with symptoms of fibrosis), by compressing the nerve, form characteristic clinical symptoms. Therapeutic techniques of myofascial release of the sacrotuberous ligaments and the articular sacroiliac complex sometimes alleviate the painful manifestations of interligamentous compressions for some time. On the other hand, a positive result from such effects may be a confirmation of the diagnosis. The pathognomonic sign of all tunnel syndromes is Tinel's symptom - tapping at the site of compression provokes the sensation of “passing an electric current” along the nerve. The author identified and proposed for practical application version of the symptom of Tinel with interligamental pudendal neuropathies.

Keywords: Interligamental Pudendal Tinel Symptom; Pudendal Neuropathy; Pudendal Symptom of Two Hammers

Introduction

Among the diseases of the pudendal nerve (pudendal neuropathy - PNP), the most frequent is its compression injury - tunnel neuropathy. Tunnel mononeuropathy is a clinical symptom complex caused by the compression of nerves and blood vessels in anatomically formed channels (“traps”, “tunnels”), as well as in other narrow anatomical gaps and make up 30% of diseases of the peripheral nervous system [1]. The prevalence of tunneling PNP may be indicated by the fact that out of 576 outpatient patients of both sexes referred to a neurologist by doctors of different specialties for pelvic pain, 8 people (1.4%) were later diagnosed with tunneling PNP [2]. To conduct an adequate analysis of the epidemiological statistics of this pathology today is impossible, since the current tenth International Statistical Classification of Diseases and Related Health Problems does not distinguish it as a separate nosology. It is encoded with the code G58.8 - “Other specified types of mononeuropathy”.

Anatomy of the Pudendal Nerve. Current Zones and Compression Mechanisms

The mechanism of development of tunnel forms of PNP is associated with the anatomical features of the location of the pudendal nerve (Figure) [3].

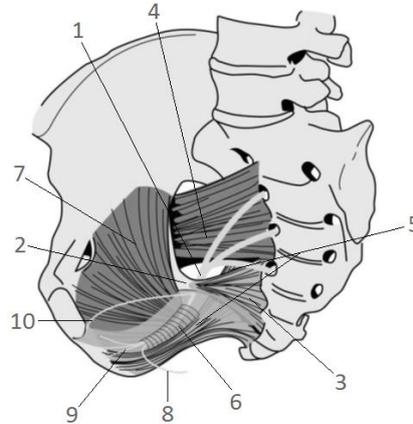


Figure. Anatomy of the pudendal nerve (<http://www.perineology.com/files/ics-glasgow-anatomy.pdf>). [3]

The nerve (1) is formed from the S2, S3, S4 spinal nerves, leaves the pelvic cavity through a small hole subpiriforme, bending around the back of the ischial spine (2) or the sacrospinous ligament (3) attached to it. Here, it can be compressed under a tense pear-shaped muscle (4) or between it and the sacrotuberous ligament (5), forming a subpiriforme pudendal neuropathy. Sometimes within the framework of the syndrome of the pear muscle, simultaneous compression of the sciatic and pudendal nerves occurs. Further nerve compression is possible between the strained sacrospinous (3) and the sacrotuberous (5) ligaments (interligamentary pudendal neuropathy). These ligaments in phylogenesis were the muscles that move the tail, and they have retained at the human contractile properties. The sacrospinous ligament tightens the lower sections of the sacrum and the pelvic bone, is of great importance in maintaining the body in an upright position and axial static loads. The sacrotuberous ligament attracts either the ischial bone or the sacrum, depending on the existing fixation point, plays an important role in motor acts [4]. The pathological tension of these ligaments provokes disturbances in biomechanics and postural imbalance not only in the pelvic region, but also in the entire human locomotor chain. Next, the nerve returns to the pelvic cavity. Here it can be compressed in the Alcock canal (6) formed by the split fascia of the internal obturator muscle (7). This canal is a gate for the pudendal nerve and blood vessels on their way from the pelvic cavity to the ischial-rectal fossa. The rectal (8) and perineal (9) nerves, as well as the dorsal nerve of the penis in men and the clitoris in women (10), depart from the nerve here.

Interligamentous Compression. Statistics. Clinical Picture

Data on the percentage of the above localizations of tunnels differ in several studies (table).

Author	Compression sites of the pudendal nerve		
	interligamentous	Alcock channel	others, including combined compression
Bautrant E et al., 2004 (n=406) [5]	68%	12%	20%
Antolak SJ, 2011 [6]	>90%	<10%	-
Zaitsev AV et al., 2016 [7]	42%	26%	17%
Izvozhikov SB, 2019 (n=75)	68%	13.3%	18.7%

Table: The frequency of localization of tunnels in several studies

Entitled to state the maximum frequency of interligamentous tunnels.

Interligamentous forms of PNP are characterized by persistent aching pain in the buttock or anogenital area in combination with mild sphincter disorders (in the absence of symptomatology of equine compression). The latter are manifested in the form of mild urinary retention or urinary incontinence (less often), weakening of erection; disorders of the sphincter of the rectum are quite rare. The pain increases when walking, in a sitting position, during stool, intercourse, urge to urinate. Characterized by a positive test for tension of the genital nerve (stretching the sacrospinous ligament when passively bringing the knee to the opposite shoulder causes pain in the coccyx and buttock) and soreness of the homolateral sciatic spine [8]. Sometimes, using techniques of myofascial release of the sacrotuberous ligaments and the articular sacroiliac complex, the painful manifestations of interligamentous compressions can be somewhat reduced for some time [9]. These techniques can be used both for diagnostic and therapeutic purposes in this pathology.

Tinel's Pudendal Symptom

The first variant of Tinel's symptom (named after French neurologist Tinel Jules) is a pathognomonic sign of tunneling neuropathies - percussion at the site of nerve compression causes a feeling of "electric current", often with a sensation of pain, along the nerve, often in the distal direction. The symptom is associated with partial damage to the nerve or with the process of its regeneration. There is a direct dependence of the degree of compression on the severity of the symptom. The paronomasia statement is logical: "Each tunnel should have its own Tinel" [9]. This symptom is described many times during intracanal compression of the pudendal nerve. Transvaginal / transrekraralny palpation or tapping of the area of the channel Alcock causes the corresponding sensations in the zone of innervation of the pudendal nerve. Symptom Tinel can also be detected by percussion of the dorsal penile / clitoral branch at the lower edge of the pubic bone. Conducting research in this direction, the author found an opportunity to identify the symptom of Tinel with interligamental PNP [9]. Technically, the test is performed as follows. The patient lies on his back so that the ischial tubercle is slightly protruding beyond the edge of the couch, then as much as possible brings the knee to the shoulder of the same name, stretching the sacrotuberous ligament. Perhaps the position of the patient lying on his stomach on the leg bent and brought to the shoulder. A doctor in the ischiorectal fossa palpates the ligament and tightly presses the "plysimeter" against it (for example, the impact part of the neurological hammer). Then, a low-amplitude percussion strike

is applied to the “plysimeter” (preferably with another hammer, with the base of the palm; in the latter case, it is much more difficult to control the impact force). Thus, the shock wave propagates along the tensioned ligament to the tunnel site, causing more nerve irritation. It is much easier to carry out this test without stretching the sacrotuberous ligament - in the position of the patient lying on his stomach with his legs extended; but in this case, the symptom may not be clear. This symptom can be called “interligamental pudendal symptom of Tinel”, or “pudendal symptom (test) of two hammers”.

Conclusion

PNP is an actual pathology associated with pelvic pain, frequent violations of excretory and sexual functions. Given the anatomical features, the pudendal nerve is the most vulnerable among the nerves innervating the pelvic organs and the perineum. The most frequent place of its compression is the area between the sacrospinous and sacrotuberous ligaments. The problem of both diagnosis and treatment of PNP is aggravated by the fact that access directly to the pudendal nerve and its branches is much more complicated than to the peripheral nerves of other localizations. Therefore, doctors whose professional interests are in the pelvic area are recommended to have basic skills in the manual diagnosis of soft tissue structures of the pelvis.

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