

# Video Journal of Movement Disorders

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## 痛みの生理学

望月 仁志<sup>1)</sup>、宇川 義一<sup>2)</sup>

### 要旨

痛みは組織に損傷を与えるような刺激に対して生じる感覚で、生体にとって重要な防御機構の一つである。痛み刺激を感知するのは特別な構造をもたないA $\delta$ やC線維の自由神経終末で、A $\delta$ 線維には機械的侵害受容器、C線維にはポリモーダル受容器が痛み刺激を信号に変換する。一次感覚ニューロンである脊髄後根神経節からの侵害性信号は、脊髄の後角にある二次感覚ニューロンに投射し、脊髄視床路・脊髄網様体路を經由して三次ニューロンのある視床に投射される。視床からの信号は、大脳皮質や大脳辺縁系で痛みとして感知され、自律神経反応、防御反応が引き起こされる。また、大脳皮質および脳幹部からは脊髄後角に対する痛みの抑制系経路が存在し、疼痛の抑制に寄与している。

Physiological signaling pathways for pain

Hitoshi Mochizuki<sup>1)</sup>, Yoshikazu Ugawa<sup>2)</sup>

### Abstract

Pain elicited by noxious stimuli (including physical, chemical, thermal, and toxic stimuli) is an important defense mechanism against harmful or dangerous invasions. Pain sensation is generated and regulated by the following sophisticated pathways. The free nerve endings of two types of peripheral nerve fibers first perceive such invasive changes: C fiber and A-delta fiber. The polymodal nociceptors in unmyelinated, slowly conducting C fibers respond to thermal, mechanical, and chemical stimuli. The mechanical nociceptors in myelinated, rapidly conducting A-delta fibers respond to strong mechanical stimuli. The primary sensory neurons in dorsal root ganglia receive the above noxious signals and project them to secondary sensory neurons in the dorsal horn of the spinal cord, which are further projected to tertiary sensory neurons in the thalamus via the spinothalamic tracts or spino-reticulo-thalamic pathways. Two kinds of signals from the thalamus are transmitted to several cerebral cortical areas. A part of the signals are projected to the limbic system including the cingulate cortex, and induces emotional, autonomic or defensive reactions. The pain signals of location and intensity are projected to the somatosensory or parietal cortices. To control overactivation of pain responses, the descending pain inhibitory systems regulate the spinal dorsal horn cells that reside in the brainstem (mediated by serotonergic, dopaminergic, and other transmitters), and the brainstem neurons are controlled by cortical neurons.

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Running title : Pain in PD

**Movement Disorders****Review**

Video Journal of MD 総説 Review 2

**パーキンソン病に認める痛みの病態と治療**渡辺 宏久<sup>1)</sup>、水谷 泰彰<sup>1)</sup>、伊藤 瑞規<sup>2)</sup>**要旨**

パーキンソン病 (PD) において、痛みは代表的な非運動症状の1つである。PDでは、PDの病態に由来する痛み、侵害受容性疼痛、神経障害性疼痛、痛覚変調性疼痛など多様な痛みを認める。また、複数認めうることも特徴である。PDでは、痛みに関わる上行性疼痛伝導路と下行性疼痛抑制系に種々の病変が出現する可能性があり、運動緩慢、筋強剛、ジスキネジア、ジストニア、アカシジア、うつなどが痛みに関連しうる。治療の第一は、適切な問診と神経診察に基づく病態把握であり、PD由来を考えるときには、抗パーキンソン病薬の最適化や非運動症状への対応となる。痛みは、PDの運動症状にも影響する可能性がある点に留意する必要がある。

Pathophysiology and Treatment of Pain in Patients with Parkinson's Disease

Hirohisa Watanabe<sup>1)</sup>, Yasuaki Mizutani<sup>1)</sup>, Mizuki Ito<sup>2)</sup>**Abstract**

In Parkinson's disease (PD), pain is one of the prevalent non-motor symptoms. Various types of pain are observed in PD, including pain caused by pathophysiology of PD, nociceptive pain, neuropathic pain, and nociplastic pain. In PD, lesions may involve both the ascending pathways that conduct pain and the descending pathways that inhibit pain. Symptoms such as bradykinesia, rigidity, dyskinesia, dystonia, akathisia, and depression may accompany pain in PD. Effective treatment begins with understanding the pathophysiology based on information obtained through interviews and neurological examinations. When pain is considered to arise from the pathophysiology of PD, optimizing antiparkinsonian medications and managing non-motor symptoms are crucial. Additionally, it is important to recognize that pain may also affect the motor symptoms of PD.

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## パーキンソン病患者の腰痛に対する運動療法

三原 雅史<sup>1)</sup>

### 要旨

腰痛は、脊柱やその周辺の筋骨格系の障害や神経障害、その他の臓器障害に伴って生じ、痛みの合併が多いパーキンソン病患者では約半数で報告されている。慢性腰痛は日常生活や生活の質に影響を及ぼし、パーキンソン病の固縮や姿勢異常が腰痛の増悪因子として重要である。一般の慢性腰痛に対しては体幹筋のストレッチやエクササイズなどの運動療法が推奨され、エビデンスは十分ではないものの、パーキンソン病においても同様のアプローチが推奨されている。本稿では、パーキンソン病患者の腰痛に対する運動療法について、いくつかの実例を動画で紹介する。

Exercise therapies for low back pain in Parkinson's disease

Masahito Mihara<sup>1)</sup>

### Abstract

Low back pain is associated with disorders of the spine and surrounding musculoskeletal system, as well as neuropathy and disorders of other organs. In patients with Parkinson's disease in whom pain is a common complication, low back pain is reported in approximately one-half of the patients. Chronic low back pain affects activities of daily living and quality of life. Rigidity and postural abnormalities in Parkinson's disease are important exacerbating factors for low back pain. Exercise therapies such as trunk muscle stretching and exercises are recommended for low back pain in Parkinson's disease. This video presents some examples of exercise therapy for low back pain in patients with Parkinson's disease.

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Running title : Symptoms and Diagnosis of NIID

**Movement Disorders**

**Review**

Video Journal of MD 総説 Review 4

## 神経核内封入体病 (Neuronal Intranuclear Inclusion Disease : NIID) の症状と診断

曾根 淳<sup>1)</sup>

### 要旨

神経核内封入体病 (NIID) は、核内封入体が神経系および全身の細胞に広く観察される神経変性疾患である。近年、皮膚生検がNIIDの診断に有用であり、原因遺伝子が*NOTCH2NLC*のGGCリピートの延長であると報告された。

NIIDの振戦については多くの報告がある。筆者も振戦を伴うNIID例を多数経験したが、多くが動作時振戦である。本稿では姿勢時振戦、安静時振戦および動作時振戦を動画で示している。

他の神経疾患コホートで*NOTCH2NLC*のリピートを解析した結果、延長を認めたとの報告がある。しかし、NIIDでは広範囲に病理学的な変化が出現するため、罹患期間中に他の神経疾患と診断される可能性がある。新たな知見を活用し、各疾患の疾患概念を再整理し、臨床に還元する必要がある。

Symptoms and Diagnosis of Neuronal Intranuclear Inclusion Disease

Jun Sone<sup>1)</sup>

### Abstract

Neuronal intranuclear inclusion disease (NIID) is a neurodegenerative disease in which intranuclear inclusions are widely observed in cells of the central and peripheral nervous systems as well as systemic organs. In 2011, skin biopsies were reported to be useful in diagnosis of NIID. Furthermore, report in 2019 revealed that the causative gene was an expansion of the GGC repeat sequence in the *NOTCH2NLC* gene, and the number of diagnosed cases has since increased. Many NIID cases are currently diagnosed antemortem by skin biopsy and genetic tests, and the clinical features of NIID are analyzed and reported.

Many reports have been published on the presence of tremors in NIID with GGC repeat expansion in *NOTCH2NLC*. I have also experienced many NIID patients with essential tremor-like symptoms, and I have the impression that most of them are action tremors. I have also seen patients with writer's cramp. This video presents postural tremors, rest tremors and kinetic tremors in the right upper extremity. Tremors appear during writing, resulting in poor handwriting.

A series of reports of cohorts with various diseases such as leukoencephalopathy, amyotrophic lateral sclerosis, oculopharyngodistal myopathy, and essential tremor have described the presence of GGC repeat expansion in *NOTCH2NLC*. In NIID patients, intranuclear inclusions are prevalent in the nervous system, and neuronal loss can be associated with a variety of clinical manifestations. Therefore, there is a possibility that NIID cases may be clinically diagnosed as other neurological diseases during the long disease period. Examination of both the presence of intranuclear inclusions in skin biopsy samples and the GGC repeat expansion in *NOTCH2NLC* is desirable to differentiate from other neurological diseases showing similar clinical findings. It is necessary to utilize new findings to reorganize the disease concept of each disease and apply it to clinical practice.

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## バルベナジンが著効した遅発性ジスキネジアの1例

野元 正弘<sup>1)</sup>

### 要旨

双極性障害により治療中の40歳代女性に生じた遅発性ジスキネジアの1例を報告した。舌の持続的な不随意運動で不快感が強かった。バルベナジン40mgにより消失したが、倦怠感のために休薬した。チアプリドに変更したところ再発したために、再度バルベナジンを開始したところ、ジスキネジアは消失して倦怠感は軽快して治療できている。

A case of tardive dyskinesia showing marked improvement by valbenazine tosilate therapy

Masahiro Nomoto<sup>1)</sup>

### Abstract

The report presents a case of significant improvement of tardive dyskinesia by treatment with valbenazine tosilate. A female patient in her forties was referred to our hospital for treatment to control continuous involuntary tongue movements. She had been receiving treatment with antipsychotic medication for bipolar disorder for 10 years, and experienced persistent tongue movements for the last 6 months. Neurological examinations revealed pronounced lingual dyskinesia, resulting in impaired chewing and considerable discomfort. She was initially prescribed a daily dose of 40 mg of valbenazine tosilate, which had beneficial effects on the lingual dyskinesia. However, because of malaise during treatment, valbenazine tosilate was replaced by tiapride. Discontinuation of valbenazine tosilate led to relapse of lingual dyskinesia with marked discomfort. Re-initiation of valbenazine tosilate resulted in continuous improvement of dyskinesia without malaise.

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Running title :

Letter to the editor

## The posture of "Ohikae-nasutte", a greeting used by Japanese outlaws in Edo era, is useful for patients with parkinsonism with difficulty rising from the chair

Fumio Kondo<sup>1)</sup>

Treatment of patients with parkinsonism faces many challenges including freezing of gait, falls, and postural instability. The disability to stand up significantly impairs activities of daily living and can be a burden to caregivers, causing distress. Clinicians should work on improving this symptom to provide relief for the patients and their caregivers.

When getting up from a chair, we draw our lower limbs towards the body and lean the head forward. Patients with Parkinson's disease tend to lack these movements<sup>1)</sup>. While drug interventions may not always improve these movement defects, patients desire helpful cues and effective rehabilitation.

In a patient with progressive supranuclear palsy who was concerned about his difficulty in standing up, I instructed him to adopt the "Ohikae-nasutte" pose. Slowly, he stooped and extended their right hand

forward with the palm up, eventually successfully rising from the chair (**Video**). This posture includes putting the hand forward, abducting the upper limbs, and moving the center of gravity forward as a result. Calling out "Ohikae-nasutte" and demonstrating the posture by caregivers may serve as a visual and auditory cue to start moving the center of gravity.

"Ohikae-nasutte" is a greeting style used by outlaws in the Edo era, as seen in Kabuki. They repeatedly said "Ohikae-nasutte" while pulling their left foot, bending their knees, and extending their hand forward with the palm up. This peculiar posture symbolizes that the outlaws are not carrying knives or weapons and have no hostile intent towards the unfamiliar rivals. This style of greeting often appears in comedic cinematography, bringing joy and relief to many Japanese people. In our clinic, I have introduced this

**Video** 視聴する場合には▶をクリック



Video Video recording to show the PSP patient to stand up

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