

Treatment for Depression with Chronic Neck Pain Completely Cured in 94.2% of Patients Following Neck Muscle Treatment

Takayoshi Matsui^{1,2}, Toshiro Fujimoto^{3*}

¹Tokyo Neurological Center, Tokyo, Japan; ²Matsui Hospital, Kagawa, Japan; ³Fujimoto Hayasuzu Hospital, Miyazaki, Japan.
Email: ceo@fujimoto.or.jp

Received March 11th, 2011; revised April 14th, 2011; accepted April 23rd, 2011.

ABSTRACT

We report three patients with cervical neuromuscular syndrome (CNMS) who followed similar courses. Autonomic imbalance may occur following neck muscle pain, and a wide variety of somatic symptoms including headache and vertigo appear and a generalized poor condition may continue for long periods. If many such somatic symptoms persist for months to years, symptoms of depression are exacerbated. The patients end up in psychiatric clinics, where they are diagnosed with depression, but they do not respond to antidepressants. Thus, they continue to suffer for many years. These patients eventually were completely cured with the resolution of neck pain by neck muscle treatment, using two types of special low-frequency therapy equipment, far-infrared radiation and acupuncture. When treatment for the neck muscles is initiated, symptoms of depression are quickly relieved, and diverse somatic symptoms disappear one after another as neck muscle tension is gradually alleviated (the number of abnormal neck muscle checkpoints decreases). Such a course suggests that neck muscle tension and chronic pain are closely related to depression. Neck muscle-related depression due to CNMS clearly differs from psychiatric conditions such as major and bipolar depression. In patients with neck muscle-related depression, symptoms of depression are not accompanied by ungrounded anxiety, a sense of emptiness, apathy, or self-rejection. Neck muscle abnormalities leading to CNMS are caused by head injury, whiplash injury, and a prolonged forward-bent-posture due to using a personal computer, playing computer games, texting, and engaging in machine-paced work such as assembly-line operation.

Keywords: Cervical Neuromuscular Syndrome, Depression, Neck Muscle Pain, Neck Muscle Tension, Autonomic Imbalance

1. Introduction

Reports that chronic pain often causes depression and emotional disorders are increasing [1-5]. Although the relationship of chronic pain to depression remains unclear, it may be related to the multidimensional nature of pain, which has biological, psychological, and biopsychosocial parameters [6-9]. In particular, chronic pain and tension in neck muscles induce a wide variety of symptoms including chronic dystonia, headache, and dizziness [10-13]. These symptoms include headache, neck pain, and shoulder pain; dizziness and unsteadiness; nausea; insomnia; unsteady blood pressure; abnormal body temperature control; perspiration abnormalities; palpitation; salivation abnormalities; mild fever; visual and ocular abnormalities (reduced or blurred vision, easy fatigability and eye pain, increased sensitivity to light, and watery or

dry eyes); abdominal symptoms (nausea, anorexia, sense of abdominal fullness, swallowing difficulties, diarrhea, and abdominal pain); and mental symptoms (sickness on the day of or the before bad weather, depressed mood, reduced concentration, anxiety, lack of perseverance, easy fatigability, and feeling of chest compression) (**Table 1**). Symptoms such as panic disorder, menopausal disorders, chronic fatigue syndrome, and hyperhidrosis, which are not included in the Matsui Index, are also occasionally observed.

Patients suffering from these diverse symptoms have visited one hospital after another, but the causes remain unidentified, and they receive diagnoses of depression, autonomic disturbance, adjustment disorders, neuropathy, or hypochondriasis. These patients commonly exhibit symptoms of depression and are frequently diagnosed with depression by psychiatrists. However, their condi-

Table 1. Matsui index.

Symptoms
Headache or heavy headedness
Neck pain or tension
Stiff shoulders
Frequently catching a cold
Light headedness or vertigo
Feeling unstable while walking or standing
Nausea, anorexia
Difficulty in falling asleep and intermittent awakening at night
Unstable blood pressure
Difficulty remaining in a warm place for a prolonged period (abnormal body temperature control)
Frequent sweating
Pounding heart at rest
Visual difficulty, blurry vision
Easily tired or painful eyes
Over-sensitivity to light or difficulty in keeping eyes open
Dry eyes or excessive tears
Saliva production is copious or absent
Mild fever (at 37°C, occasionally exceeds 38°C)
Frequent diarrhea (gastrointestinal symptoms, such as abdominal pain)
Habit of lying down at daytime
Severe fatigability
Loss of interest in all activities or motivation
Feeling unwell during bad weather or the day before
Depressive mood or feeling down
Loss of concentration or attention
Generalized anxiety
Irritation or frustration
Impatience, difficulty in working or studying for long hours
Hot flushes, cold or numb hands or legs
Pain, pressure, or numbness in the chest

tions characteristically do not improve despite antidepressant medication or psychological therapies such as counseling causing prolonged suffering.

Matsui studied such patients for about 30 years to identify an appropriate treatment. After numerous trials and errors, he established a treatment for neck muscles in 2005, and showed that the wide variety of symptoms mentioned above can be cured by this treatment. These patients exhibit the important characteristic of having experienced symptoms for a prolonged period before the diagnosis of depression by psychiatrists. Abnormalities of the neck muscles probably induce the above somatic symptoms, and their persistence eventually leads to a

diagnosis of depression. These characteristics indicate a close relationship between the neck muscles and depression, which was completely resolved in more than 94% of the patients following the treatment of neck muscle abnormalities without antidepressants. Matsui called this new disease cervical neuromuscular syndrome (CNMS).

The objective of this study was to evaluate the close relationship between depression and chronic pain by presenting three cases selected from 130 patients who had neck muscle abnormalities, exhibited diverse symptoms, and were diagnosed with depression by psychiatrists but eventually were completely cured with the resolution of neck pain by neck muscle treatment.

2. Subjects and Methods

2.1. Subjects

One-hundred thirty-eight patients were treated for CNMS between January 6, 2006, and August 4, 2008. They were given the following primarily physical treatments targeted to the sites of objective abnormalities in two types of muscle.

2.2. Treatments

1. Two types of special low-frequency therapy equipment were used

1) Trimix Linus TM-5502 low-frequency SSP therapy equipment from Nihon Medix Co., Ltd., and

2) Topra LCA-204 W.E.S low-frequency therapy equipment from Celcom Medico, Inc.

2. Far-infrared radiation

Therapia 3300 infrared therapeutic device from Nihon Medix Co., Ltd.

3. Acupuncture

Nobel Pulse RP-4 electric acupuncture device from Riken Iryo Denki,

4. Drug therapy

Fursultiamine (50 mg/day), thiamine disulfide (100 m/day), pyridoxine hydrochloride (10 mg/day), and cya-

nocobalamin (1,000 g/day) were used.

2.3. Subjective Complaints

Thirty symptoms frequently observed in CNMS as shown in **Table 1** were selected and checked during history taking.

2.4. Objective Findings

Neck muscles were examined for muscle rigidity and tenderness at 34 checkpoints (**Figure 1**).

3. Results

Of the 138 patients treated at our hospital for neck muscle disorders between January 6, 2006 and August 4, 2008, 130 were cured, with a cure rate of 94.2%. Three typical cases are described.

3.1. Case 1

A 40-year-old female began to have headaches in the second half of her 20s. She had frequent headaches when she was 35, and she also had hot flushes, a feeling of chest compression, and palpitations, which she felt were due to the climacteric. This was followed by irritation and impatience, and she became unwilling to do anything and lost volition.

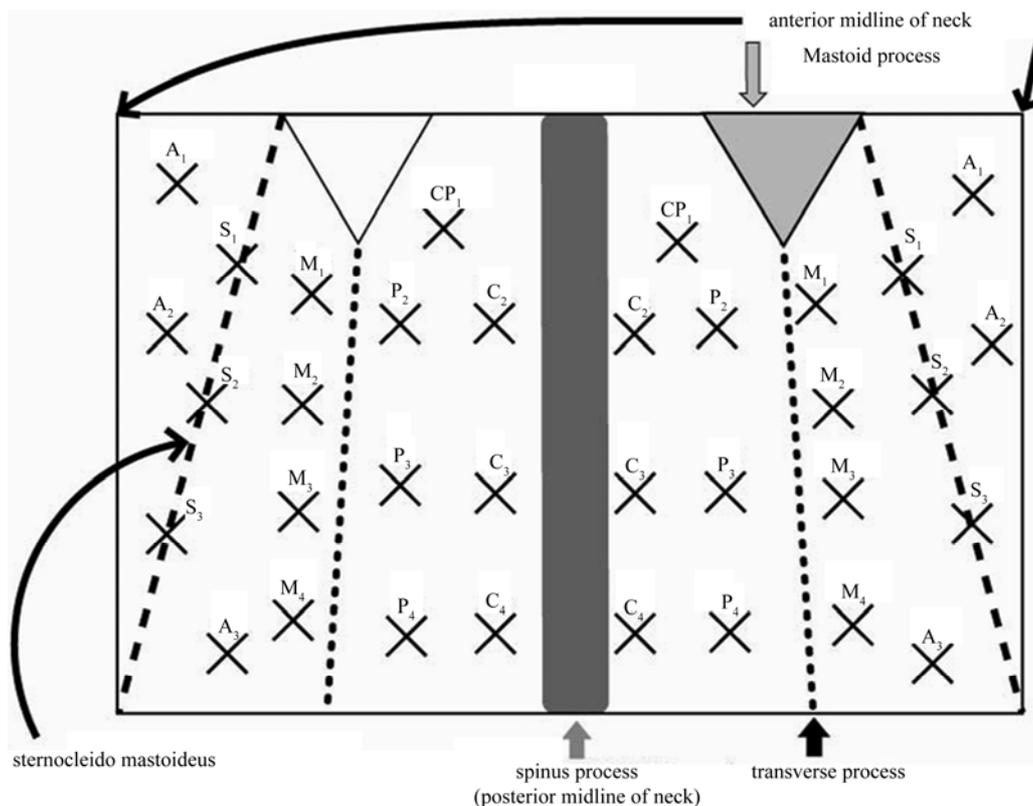


Figure 1. Muscle rigidity and tenderness were examined at the 34 checkpoints in the neck muscles.

At the age of 38, she suddenly felt a stinging sensation in her eyes and had an episode of mosaic defects of the visual field, which lasted for five minutes. Similar episodes recurred many times, and defects of the visual field persisted for 30 minutes per episode. Although she consulted an ophthalmology department, no abnormality was found. She was referred to a neurology department and underwent various examinations including MRI, CT, and blood tests. She was diagnosed with migraine and tension headache and medicated. She thereafter began to feel heaviness of the neck and head and often spent all day in bed. She was dazzled by light and could not drive or go out without sunglasses even on cloudy or rainy days. Headaches further intensified despite medication. She began to stay recumbent whenever possible as she felt dizzy in an upright position and as if the ground was swaying when she walked. Vertigo sometimes persisted even after she lay down. She consulted one hospital after another and repeatedly underwent various examinations, but no abnormality was detected. While she complained of many abnormalities, she was not diagnosed. Her family could not understand why she was sick. Because she appeared normal, she was thought to be lazy and malingering, and this suspicion grew in her family. She gradually lost the willingness to do anything and tended to avoid even talking to others. When she went shopping, she felt sick in crowded places, and she once fell asleep in her car at a shopping center. She began to avoid going out. Because she showed no improvement under the care of a neurologist, she was referred to a psychiatrist and was diagnosed with depression.

She was medicated with an antidepressant and tranquilizer and received counseling, but these treatments were ineffective. She became more depressed and developed vertigo, headache, and nausea. Because she could not even stand up due to vertigo, she consulted an otorhinolaryngologist, whose diagnosis was Meniere's disease. She received an intravenous antivertigo drip and took more than 10 kinds of oral preparations daily with no improvement. She frantically screamed and threw things at her children and became unable to perform housework. Around this time, her husband heard of CNMS and took her to the TNC, where she was admitted for treatment.

On admission, no particular abnormality was noted on ECG, chest X-ray, blood chemistry tests, or urinalysis. Abnormality was observed at all 34 checkpoints in the neck muscles, and, on inquiry, 26 of the 30 symptoms on the checklist were positive. One week after admission, nausea, mild fever (a characteristic symptom of CNMS, the cause of which remains unknown), and intestinal symptoms such as diarrhea disappeared. After two weeks, most symptoms of depression including depressed mood,

lack of volition, unexplained anxiety, irritation, and impatience disappeared.

Three weeks after admission, symptoms including a lack of concentration and impatience were resolved, resulting in the resolution of all mental symptoms. After four weeks, symptoms including easy fatigability, blurred vision and eyestrain, abnormal body temperature control (not being able to stay in a warm room), and abnormal perspiration disappeared.

General fatigue was resolved after five weeks. Vertigo and dizziness disappeared after six weeks, insomnia was resolved after seven weeks, and cold feet disappeared after nine weeks. After 10 weeks, headache and weather-dependent sickness were fully resolved. The intensification of symptoms before bad weather is a characteristic of CNMS. Only neck and shoulder stiffness remained, and, although they were also expected to be resolved by continuation of the hospital stay, the patient was discharged after 10 weeks for family reasons.

About two months after admission, she began to wish to be discharged, being very eager to resume her life, and appeared to be a totally different person compared with when she was admitted. Because autonomic activities were normalized, she even began to appear much healthier than an average woman of her age. This is a common feature of patients who have undergone this treatment, and many of them begin to look 10 or more years younger than they used to. The patient also stated that she felt as mentally and physically healthy as if she had been reborn. At discharge, the patient, whose gait had been unstable, walked steadily and held cheerful conversations, being relieved of the symptoms of depression. She said she had begun to think positively.

No recurrence of depression has been noted for three years since discharge.

3.2. Case 2

Four years prior, a 55-years-old male had developed headache and eye strain. He could not continue working into the evening due to neck pain, headache, and eye symptoms. Because symptoms of depression were also exacerbated, he consulted a psychosomatic clinic. The diagnosis was depression, and sleeping pills and serotonin and norepinephrine reuptake inhibitors (SNRIs) were prescribed. However, the treatment was ineffective for headache, and no improvement in the eye symptoms was noted. Although the doctor told him that headache and neck pain would be alleviated with the resolution of depression, symptoms of depression alternately showed mitigation and exacerbation over more than a year. The sleeping pills and SNRIs had some effects on the symptoms of depression, but no effect on the headache and

eye strain, which were his chief complaints. Patients with depression often experience an exacerbation of symptoms at fixed hours of the day such as the early morning, but this patient felt well every morning, and headache and eye pain gradually intensified as he worked, so he questioned his diagnosis of depression. He obtained a medical certificate issued by his attending physician, and was transferred to a less strenuous division of his company. Despite the decrease in work-related stress, no improvement in his condition was observed during the year that followed. He, therefore, consulted a contract physician of the company and was advised to take a two-month leave of absence, which he took two years ago, with no improvement in the condition.

Nine months ago, he was informed of a newly described disease called CNMS and consulted the TNC. Abnormality was noted at all 34 checkpoints in the neck muscles. At that time, he was taking SSRI and SNRI prescribed by the psychosomatic clinic. While hospitalization was necessary, he could not be admitted immediately because of a long waiting list, so he received neck muscle treatment as an outpatient. He had been medicated with paroxetine hydrochloride at 20 mg/day and sertraline hydrochloride at 50 mg/day for depression, but paroxetine hydrochloride was gradually reduced until complete withdrawal during outpatient management.

The patient was admitted to Matsui Hospital two months previous. On admission, abnormality was noted at 22 checkpoints in the neck muscles. The number of symptoms had been reduced from 22 to 14 as a result of outpatient treatment, and the number of abnormal checkpoints was decreased from 34 to 22. Because all symptoms of depression had disappeared during outpatient treatment, the antidepressants were gradually reduced to complete discontinuation.

Two weeks after admission, all eye symptoms including dazzling, dry eye, and blurred vision disappeared. Dizziness also disappeared, and the number of symptoms affirmed on inquiries had decreased to five. After three weeks, headache also disappeared, and the dose of the antidepressant sertraline hydrochloride was reduced from 50 to 25 mg. After four weeks, insomnia was resolved. After five weeks, neck pain disappeared, and all antidepressants were withdrawn. After seven weeks, shoulder stiffness and cold feeling in the hands and feet disappeared, and, as no symptom was noted on inquiries, indefinite complaints were judged to have been resolved.

Thus, all symptoms disappeared and all checkpoints in the neck muscles became normal during an 8-week hospitalization, and the patient was discharged in a favorable condition. No recurrence has been noted for 18 months after discharge.

3.3. Case 3

A 24-years-old female became totally unable to do housework due to neck pain, headache, nausea, vertigo, shoulder stiffness, and eye pain. She could not even leave her house. She consulted a hospital, was diagnosed with depression, and was administered an antidepressant.

One and a half years ago, she sustained a whiplash injury and was treated for six months, but the neck pain was exacerbated. As the symptoms intensified, she repeatedly attempted suicide.

She heard about the newly described disease CNMS and consulted the Tokyo Neurological Center, where she was diagnosed with CNMS and admitted.

On admission, 21 of the 30 symptoms on the checklist were noted. Although 25 symptoms were noted at the initial examination, four symptoms disappeared during outpatient care. Abnormalities were observed at all 34 checkpoints in the neck muscles.

One week after admission, loss of interest or motivation, depressive mood, generalized anxiety, and irritation or frustration had disappeared. The number of symptoms had decreased from 21 to 16 with the disappearance of most symptoms of depression.

After two weeks, the number of symptoms had decreased to seven, with no symptom of depression remaining. Symptoms including vertigo, dizziness, shoulder stiffness, insomnia, general fatigue, and coldness of the hands and feet also disappeared.

After three weeks, symptoms became unaffected by the weather.

After five weeks, hyperhidrosis disappeared.

After six weeks, headache disappeared.

After seven weeks, eye symptoms such as blurred vision, eyestrain, and eye pain disappeared.

After eight weeks, neck pain had almost disappeared.

The number of symptoms was 0 at eight weeks after admission, but neck muscle abnormality remained at 2 checkpoints. She was discharged early due to her work, but her cure was nearly complete. No neck pain or depression has occurred during the three and half years since discharge.

4. Discussion

These are the first case reports of the condition called cervical neuromuscular syndrome (CNMS) by Matsui. This syndrome involves chronic neck pain (neck muscle tension), psychiatric symptoms (depression, anxiety), and autonomic imbalance, but the symptoms of depression are resolved first by treatment for the neck muscles, generalized somatic symptoms then disappear with decreases in neck muscle abnormalities, and both psychological

and somatic symptoms of CNMS eventually disappear. This study indicates the importance of the neck muscles. This seems natural as the neck is the interface between the head and trunk. CNMS presents such a diversity of symptoms that patients are unsure of which medical specialty they should consult. However, whichever specialty they consult, only medication to alleviate the symptoms in the field of that department is available. Patients eventually end up at the psychiatric department and are diagnosed with depression, but this condition is not cured by antidepressants.

Patients with CNMS show similar clinical courses. They show an onset with pain of the neck muscles, followed by autonomic imbalance, and as a wide variety of somatic symptoms including headache and vertigo appear, a poor overall condition continues for some time. In addition, if many symptoms persist for months to years, the patients become depressed and suffer over a long period.

When treatment of the neck muscles is initiated, depression is quickly alleviated, and the somatic symptoms called indefinite complaints disappear one after another with relief of the tension of the neck muscles (decrease in the number of abnormal checkpoints) [11]. These changes suggest a close relationship between chronic neck pain and depression. Furthermore, the alleviation and cure of depression not responding to antidepressants by treatment of the neck muscles suggest neck pain as a possible cause of depression.

Concerning the relationship between depression and chronic pain of the neck muscles, Gatchel and Dersh suggested two major problems (2002) [14]. The first is the ambiguity of the definition of depression. In psychiatry, the term depression is used to refer to mood disorders [15,16], and depression is defined as specific depressive disorders [17] (as discrete psychiatric disorders by the DSM-III). Also, according to the DSM-IV-TR, which is currently used, depression does not include symptoms due to general physical disorders. Only when there is evidence that the condition is a direct physiologic result of a general physical disorder, can the diagnosis of "mood disorders due to 'the presence of general physical disorders'" be made rather than depressive disorders, even when the condition is physiologically related to general physical disorders. On the other hand, outside psychiatry, depression is described as a general phenomenon of depressive symptoms [17].

Secondly, there is a criteria overlap between depression and chronic pain [18,19]. Depression as a general medical term is related to symptomatic overlapping between chronic pain and depression. Due to criteria overlap, symptoms of depression are described as reactions to

chronic pain. The borderline between physical and psychological variables in the depression-related items on the Minnesota Multiphasic Personality Inventory, Beck Depression Inventory, and Center for Epidemiology Studies Depression Index is unclear, and interactions between the mind and body were noted in somatic disorders [18,19]. The diagnostic criteria of depression include a few physical disorders that may be induced by chronic pain. The possibility that depression and chronic pain may be interpreted by the cause-effect relationship has been suggested [18,19]. Are depression and chronic pain comorbidities?

Depression caused by CNMS has specific characteristics. Depression due CNMS often results in suicide. Most patients with CNMS admitted to our hospital stated that they had considered or attempted suicide. The likelihood of suicide is considered to be greater in CNMS than in depression. The 30 checklist items for the diagnosis of CNMS were selected from symptoms frequently observed in patients with this disorder. It is important to note that these items do not include feeling sad or meaningless.

This is considered to be an important difference of neck muscle-related depression due to CNMS compared with major or bipolar depression. Patients with neck muscle-related depression do not complain of ungrounded sadness, emptiness, inexplicable meaninglessness, or self-refusal, even when they have severe symptoms of depression, cannot leave their homes for years, and describe themselves as living corpses. Neck muscle-related depression may cause a prolonged depressed mood and apathy and force the patients to shut themselves in their rooms, but not unexplained sadness.

Symptoms of neck muscle-related depression are 1) loss of interest or motivation in all activities; 2) depressive mood and feeling down; 3) anxiety for no reason; 4) loss of concentration or attention; 5) irritation or frustration; and 6) impatience and difficulty in working or studying for many hours. CNMS caused by neck muscle abnormalities induces autonomic imbalance and brings about many indefinite complaints of physical disorders. Because these symptoms are clearly related to neck muscle abnormalities, they naturally disappear if the abnormalities are corrected.

We have succeeded in curing many depressed patients by employing this quite rational approach, *i.e.*, normalizing the neck muscles. The rapid propagation of personal computers, computer games, and mobile phones may be a major factor in the recent rapid increase in a new-type of depression caused by neck muscle abnormalities and increases in the number of suicides in Japan.

Neck muscle abnormalities leading to cervical neuro-

muscular syndrome (CNMS) are caused by 1) injuries such as head injury and whiplash; and 2) a prolonged forward-bent-posture when using a personal computer, playing computer games, texting using a mobile phone, and protracted machine-controlled work such as assembly-line operation.

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