

# Phantom Pain Limb: A Case Report in a Soldier - Theory and Therapy

Zulfikar Chandra S. Harahap<sup>\*</sup>, Mustafa M. Amin, Elmeida Effendy

*Department of Psychiatry Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia*

## Abstract

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**\*Correspondence:** Zulfikar Chandra S. Harahap. Department of Psychiatry Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia. E-mail: [zcsarahap17note@gmail.com](mailto:zcsarahap17note@gmail.com)

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**BACKGROUND:** Incidents in the form of unwanted things at work often occur, including civilians or officials. Like what happened during training at an Active on Duty Military Personnel (ADMP). The incident caused chronic disability and pain that we know as phantom pain limb. The frequency of "phantom pain limb" develops in individuals. Therefore, identifying the best method for treating PLP is very important. This review highlights the field of phantom pain-related investigations, focusing on PLP.

**CASE REPORTS:** We found a case of phantom pain limb, in an Indonesia National Army or called Tentara Nasional Indonesia soldier who is still active; the OS is a referral from the neurology department. The OS was taken to the hospital because of complaints of previous leg pain and had received treatment.

**CONCLUSION:** There are several promising therapies, pharmacology and others, for their treatment, and many theories have been developed to explain what we observe in patient amputations. However, we continue to lack clear evidence and explanation of the reasons that some individuals develop PLP, and some do not, why some pain subsides over time, and other PLPs still exist, and what molecular and biological mechanisms work.

## Introduction

The published literature distinguishes "phantom sensation" and "phantom pain". For example, Weinstein proposed that phantom sensations can be divided into three categories; kinetic sensations, kinaesthetic components, and exteroceptive perceptions. The kinetic sensation is the perception of movement, with the perception of consideration of both spontaneous and strong-willed movements. In contrast, the kinaesthetic component refers to the size, shape, and position of lost body parts, while exteroceptive perceptions include touch, pressure, temperature, itching, and vibration [1], [2], [3], [4], [5].

Weinstein explained phantom pain as under the "exteroceptive perception" category, but distinguished pain from sensation suggested that phantom pain has a greater intensity than phantom sensation [6].

Also, several attempts have been made to make a precise description or definition for "phantom pain". Sherman and Sherman concluded from a survey effort that the phantom pain characteristics were divided into four domains: (1) the intensity of the pain sensation; (2) frequency of episodes; (3) duration of each episode; (4) description of pain. Previous work by Melzack, Previous work by Melzack also sought to characterise phantom pain. His work describes phantom pain as 4 different traits consisting of: (1) continuous, long-lasting pain after the injured tissue recovers; (2) consists of "trigger zones" that have the

potential to spread to other areas that are (healthy) from the body; (3) often develops in patients who experience previous pain in parts of the affected body (more common in amputated civilians than amputated military) and often resemble the pain experienced before amputation; and (4) both increase and decrease in somatic input appear to have a positive influence on pain, and sometimes it may even cure the pain of phantom pains. However, several attempts to classify and define phantom pains, the pathophysiology and aetiology of conditions remain a mystery [2], [3].

Perhaps the phantom sensation and phantom pain can occur in various parts of the body. There are reports of phantom sensations and pain originating from unique places such as the breast, nose and rectum, and phantom pain menstrual cramps after a hysterectomy, urination or erection after removal of the penis [7], [8].

Although so many body parts are associated with phantom pain and phantom sensation, phantom limbs that are far from the body parts most commonly reported are associated with phantom pain limbs. Leg amputation is usually due to vascular disease, diabetes or results from traumatic events such as vehicle accidents or war-related trauma, such as blast injuries from repairing explosive devices [9].

## Case Reports

A 31-year-old man visited the RSAL Psychiatric clinic, after being referred from the neurology department because he often felt sad, aloof, irritable, loss of appetite for at least three weeks. Because the patient is an active soldier (TNI), he should not look sad, as a mechanism of his ego defence, he takes a reaction formation, but it can be seen clearly from his expression that something is wrong with him. From the Neurology section, Phantom Limb Pain was diagnosed. This feeling of sadness disrupts social interactions with other people, including his family. These feelings make the patient less powerful and do not have the spirit of life. The patient is known to be a Navy personnel. He lost his right leg after going through a series of combat training a few months ago. The patient explained the pain in the form of burning, stabbing, aching and so on, which was triggered by several conditions such as wind gusts, cigarette butts falling, passing motorbikes, flaming fires burning cigarettes, objects falling on the floor and others. The patient has experienced this pain for one year. From the Neurology department, he got Lyrica/Pregabalin to reduce the sensation of the Neuropathic Like-Syndrome. He now works in the administration department. Hearing his classmates going to a new place, he grew increasingly inferior. History of psychoactive substance use is denied as

well as head trauma

On physical examination, blood pressure was 110 / 70 mmHg, HR 70 beats/min, respiratory rate 18 x/l, the temperature at 36.1°C. There was no abnormality in the head and hair. There was no enlarged thyroid gland. Normal nose, ears. Vesicular breath sounds, no additional sounds. Regular heart rhythm, no additional sound. Normal peristalsis, no organomegaly turgor, and good skin elasticity. The patient uses a prosthetic device on the right leg. Visual Analog Score (VAS) 7-8.

In the psychiatric examination, the sensorium was found in a fully conscious state; there are no twilight states, delirium, etc. Good time orientation, place, and people orientation. Good attention. Depressive mood, appropriate affect. The process of thinking was normal; there was no process of dereistic thinking. There was no tangentiality, circumstantiality, a flight of ideas and loose associations. The flow of speech was normal, but the patient tended only to answer what is asked and not spontaneously. The delusion was not found. Illusions and hallucinations were not found. Immediate memory, short-term memory, medium-term memory, and long-term memory are in good condition. Discalculosis is not obtained. No Deja Vu, jamais vu, and other paramnesia were obtained. No depersonalisation and deregulation. Dreams and fantasies were not clear. V degree insight. Judgment, automatic consideration.

The patient is the second child of 3 siblings. The patient was born normally by being helped by a midwife. The patient was breastfed for two years. Do not have obstacles to physical development. Do not have obstacles in building relationships with other people, with peers, siblings or the opposite sex. Preschool life and school are within normal limits. The patient has a family and has a child who is two years old. The patient had thought about how the lives of children and their families would be, even though he was a TNI, but after this disability was not enough to get more income. He also had time to think whether his wife would still love her even in this situation.

### Diagnosis

- AXIS I: Moderate Depressive Episode.
- AXIS II: No diagnosis.
- AXIS III: Phantom Limb Pain.
- AXIS IV: socioeconomic life problems.
- AXIS V: GAF Scale.

### Therapy

- Psychopharmacology. Pregabalin (from the neurology section), Escitalopram 1 x 20 mg and Haloperidol 2 x 2.5 mg for two weeks.

- Mirror therapy/biofeedback.
- Interpersonal psychotherapy and CBT: Helps the patient understand the reality of incidents that occur personally, but in different perspectives to continue living.
- Social therapy: his family is invited together to support himself.

## Discussion

In making a diagnosis of a disorder, it is necessary to pay attention to the diagnostic criteria of a disorder whether or not it meets the criteria. There are many theories about the pathophysiology and aetiology in the literature. Both central and peripheral nervous system mechanisms have been proposed, and some experts suggest that phantom pain is a combination of both. Here are some theories that have been proposed for our discussion [1]. Central nervous system theory, cortical reorganisation is the most frequent reason for existence or the development of phantom pain, extensive experimental evidence has shown that somatosensory and cortical motors undergo neuroplastic changes.

Patrick Wall reported that in showing plasticity in the central nervous system. Since then, human and animal models have been used to investigate the extent of cortical reorganisation that occurs in the central nervous system following differentiation or amputation. Ramachandran et al. used magnetoencephalography to show cortical reorganisation in humans after amputation. They investigated four upper extremity regions that experienced amputations and were marked by a Penfield map, showing that it could rearrange sensory cortical motor organisations in humans [8], [10].

One of the central nervous system theories is; The Neuromatrix theory, Ronald Melzack, introduced this theory to explain the meaningful experience of limbs, such as phantom limb sensation or phantom limb pain. In particular, the Neuromatrix Theory proposes that "body-self neuromatrix" is a network of neurons in the brain that integrate various body inputs, including somatosensory, limbic, visual and thalamocortical components, and results in output patterns that evoke pain or other meaningful experiences. Neuromatrix involves sensory, affective and cognitive dimensions of the pain experience. Neuromatrix maintains a central representation of each limb, and afterlife experience, this representation can be changed or modified to reflect every new experience [11], [12].

Neuromatrix theory is a theory that proposes that the internal consciousness of a person's body is created in the brain and activated by various

perceptual inputs. Inputs received by the brain are as follows: (1) Somatosensory Input; (2) Visual Input; (3) Physical and cognitive tonic and emotional input; (4) Intrinsic nerve inhibition; (5) Inputs related to the body's stress system [12]. Additional Theory, Ramachandran and Hirstein "learned paralysis" this theory is related to the occurrence of will control over "phantom arm". Learned paralysis is most applicable, for example, in clinical scenarios of arms that are paralysed because of an avulsion of the brachial plexus that occurs before amputation of limbs [8]. In this theory, the brain has enough time to learn that limbs are immovable because when messages are sent from the motor cortex to paralysed limbs, visual feedback delivered through the brain informs the individual that the limb cannot move. As a result, this message continues to be received and repeated in the nerve pathways of the parietal lobe, and concludes in the brain and "learns" that the limbs remain in that position. This theory also shows that the same situation can occur after surgical amputation.

Instead, the brain receives information that a moving limb fails to receive feedback from newly amputated limbs to ensure that motor orders have been followed. As a result, an individual has control over the limbs immediately after amputation. However, after certain periods does not receive confirmation that the order is followed, the ability to control limb movements was reduced, and it paralysed the phantom. Finally, a theory proposed shows that Phantom Limb Pain results from a phenomenon called "proprioceptive memory" which refers to the internal awareness of limbs and the location of extremities, and proprioceptive memory refers to memories of the position of certain extremities. This hypothesis proposed that proprioceptive is an individual's memories that remain even after amputation. The mechanism of the brain associated with memory has not changed. Therefore, there is a possibility of memory of the motor and sensory information for members of the body can continue to be called. Because memory is still intact, "proprioceptive" performs as before amputation. Awareness that lost limbs appear through the visual system but not proprioceptive. The rest of the body continues to work like usual, the nerves associated with lost limbs are still active, resulting in false misrepresentations of the presence of limbs. In the case of "Phantom Limb Pain" the sensation of felt muscle cramps or joint fatigue, can be explained by the presence of proprioceptive memories [13].

In conclusion, our knowledge of PLP has increased dramatically since it was first articulated as a clinical problem several hundred years ago. We are significantly more aware of the incidence, severity, and manifestations. Also, there are several promising therapies, pharmacology and others, for their treatment, and many theories have been developed to explain what we observe in patient amputations. However, we continue to lack clear evidence and

explanation of the reasons that some individuals develop PLP, and some do not, why some pain subsides over time, and other PLPs still exist, and what molecular and biological mechanisms work. Except for opioids and mirror therapy, many of the others report treatment modalities do not have strong studies to support their effectiveness. Further studies are very important to find answers to these questions, to evaluate therapy, and to improve the care we can provide for amputee's patients who experience this unique condition.

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