



PALLIATIVE CARE CASE OF THE MONTH

“Phantom Limb Pain”

by

Carla Khalaf McStay, MD

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Case: Ms. R. is a 30-year-old female with gestational hypertension who suffered a cardiac arrest during the delivery of her daughter. Complications of extracorporeal membrane oxygenation (ECMO) cannulation resulted in a right hip disarticulation and loss of her right lower extremity. Palliative care was consulted for pain management. Six months after the initial amputation, Ms. R. described residual-limb pain at the site of her hip. She also endorsed phantom limb pain (PLP), which she described as shooting and burning pain in her absent right lower extremity. Her regimen consisted of low-dose gabapentin, methocarbamol, acetaminophen, and escalating doses of opioids. The case raised the question of how to treat PLP.

Background: Phantom limb pain is a complex syndrome that results in a perception of pain from a limb that has been amputated. It has been reported to affect up to 80% of amputees¹ Sensations felt in the absent limb can range from pain to other sensations including itching, numbness, and tingling. Despite its name, PLP has also been reported following amputations of other non-extremity body parts such as breast, eye, testicle, and tongue.

Phantom limb pain must be differentiated from residual-limb or stump pain, in which the location of the pain is in the area adjacent to the amputated limb. Phantom limb pain should only be diagnosed after other causes of post-amputation pain have been ruled out such as ischemia, infection, neuroma, and pressure-related wounds.²

The pathophysiology of PLP is not completely understood. It is thought to be due to changes that develop in the central and peripheral nervous systems post-amputation. After peripheral nerves are resected, they are thought to rewire in a way that decreases their threshold for activation. This can cause non-painful stimuli, such as light touch, to result in allodynia. This increased neuronal activity in the periphery causes central sensitization and cortical reorganization, leading to a system similar to hyperanalgesia.¹

Patient characteristics that make PLP more likely include a history of chronic pain, uncontrolled pain prior to operation, adult age, and female sex. Psychologic contributors such as depression are thought to increase the severity of the pain.¹ Oftentimes, pain in the phantom limb is similar to pain felt prior to amputation due to the development of “pain memories”.³

Treatment:

Pharmacologic Therapies

In the acute pain setting, there is evidence to support the use of IV ketamine and IV opioids, particularly in the perioperative period.⁴ However, ketamine is not supported as a long-term treatment. Randomized control trials have demonstrated a benefit of opioids in PLP.⁵ It is hypothesized that they reduce cortical reorganization.

The majority of studies showed benefit of opioids in the short-term management of acute pain.⁵ Long-term treatment of chronic opioids with PLP has not been investigated.

Another common approach includes treating PLP as a variant of neuropathic pain. While amitriptyline and other tricyclic antidepressants are commonly used, this is not supported by the available evidence.⁶ The data supporting gabapentin show mixed results.⁵ Other commonly used neuropathic agents such as serotonin-norepinephrine reuptake inhibitors (duloxetine and venlafaxine) and pregabalin have positive case reports but no randomized controlled studies regarding their efficacy.

There is one study showing improvement in PLP after application of a capsaicin 8% treatment patch to the residual limb for one hour.⁷ There are no available studies on capsaicin cream or lidocaine patches.

Mind-body approach to PLP

Guided imagery, biofeedback utilizing electromyography, muscle tension biofeedback, thermal biofeedback, visual mirror feedback, and auditory biofeedback have all been used for PLP. The data supporting these different approaches show considerable variability in the delivery of these techniques. Reaching definitive conclusions regarding these therapies is therefore challenging.⁸ Acupuncture may be effective in treating PLP, but it has only been studied in feasibility studies.⁹

Some of the most promising studies are on mirror therapy. Mirror therapy includes attempting to perform movements with the amputated limb while viewing the reflected image of the movement of their intact limb. It is thought that illusions or imagery of movement of the amputated limb alleviates the phantom limb pain due to neuron activation in the brain hemisphere contralateral to the amputated limb. In a randomized prospective study, it has been shown to reduce phantom limb pain in patients with lower limb amputation.¹⁰

General approach

Due the limited evidence, it is difficult to draw conclusive recommendations regarding the best treatment of PLP. It is likely best treated using a multimodal approach.⁵ The current data suggests using a multidisciplinary team to treat moderate/severe PLP, including physical medicine and rehabilitation, psychologists, physical and occupational therapy.

Follow Up: For Ms. R, a recommendation was given to optimize neuropathic management by increasing her gabapentin dose. Psychiatry, psychology, physical medicine and rehabilitation were consulted. Additionally, we spoke with physical therapy regarding utilization of mirror therapy. She responded well to titration of gabapentin. She was discharged to inpatient rehab with anticipation of receiving mirror therapy.

Personal details in the case published have been altered to protect patient privacy.

For palliative care consultations please contact the Supportive and Palliative Care programs at PUH/MUH, 412-647-7243, pager # 8511, Shadyside, 412-647-7243, pager # 8513, Perioperative/ Trauma Pain, 412-647-7243, pager # 7246, UPCI Cancer Pain Service, pager 412-644-1724, Magee Women's Hospital, pager 412-647-7243 pager # 8510, VA Palliative Care Program, 412-688-6178, pager # 296. Hillman Outpatient: 412-692-4724. For ethics consultations at UPMC Presbyterian-Montefiore and Children's pager 412-456-1518

With comments about “Case of the Month” call Dr. Robert Arnold at (412) 692-4834.



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