TH390 Management of phantom limb pain in traumatic lower limb amputation

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Phantom limb pain (PLP) is defined as a painful sensation referring to the missing limb and prevalence can be estimated in up to 80% of all patients after limb amputation.[1] The onset of PLP is variable, with most occurring soon after amputation but can be delayed in some patients. Pain intensity is frequently reported as moderate to severe. Generally, pain reduces in both frequency and duration during the first 6 months after amputation, however about 10% of amputees report having severe pain more than 6 months after surgery.

PLP is often projected to the distal parts of the missing limb (e.g. foot, toes). Pain may be related to certain position or movement of the phantom and may be exacerbated by physical factors like pressure on the residual limb or emotional factors like stress. PLP is more intense in the distal portions of the phantom and has qualities of neuropathic pain such as burning, stabbing, pricking pain. Telescoping i.e. the retraction of the phantom towards the amputated limb has been reported in up to 30% of patients. PLP affects patients' quality of life with 25-50% reporting severe pain-related impairment.

CASE REPORT

We describe a case of a 25-year-old female who was admitted to Khoo Teck Puat Hospital for polytrauma from a road traffic accident. She suffered the following injuries: traumatic subarachnoid haemorrhage (SAH) and subdural haemorrhage (SDH), left humerus open fracture, right tibia shaft, right ankle fracture and underwent fixation, left upper cervical ICA dissection and underwent stenting, left above knee amputation (AKA) with subsequent revision of stump. She was referred to the KTPH Pain Clinic after her traumatic AKA with complaints of phantom limb pain, she reported burning and stabbing pain in the missing limb which occurred daily and affected her sleep and quality of life. She was also diagnosed with hyper-vigilance and heightened startle response secondary to the accident not amounting to full fledged post traumatic stress disorder (PTSD) and anxiety.

She was started on gabapentin which was titrated to response up to 1800mg/day and nortriptyline 10mg once nightly. She was commenced on mirror therapy which provides the impression of viewing the amputated limb, which reduced her pain intensity. She was seen by psychiatry and started on escitalopram 15mg once nightly as well as psychology for relaxation strategies and mindfulness. She was also reviewed by occupational therapy regarding optimal fitting of her prosthesis. Through multi-disciplinary team care comprising pain physician, psychiatry and psychology, occupational and physical therapy, she had marked improvement in her PLP and was able to function independently in the community and with her activities of daily living.

DISCUSSION

Peripheral and central factors both contribute to phantom limb pain. Peripheral factors result from abnormal nociceptive input from the residual limb or ectopic discharge from a stump neuroma. Central factors are due to central sensitisation with increased excitability of the dorsal horn neurons, reduction of inhibitory processes and reorganisation of the somatosensory cortex.[2]

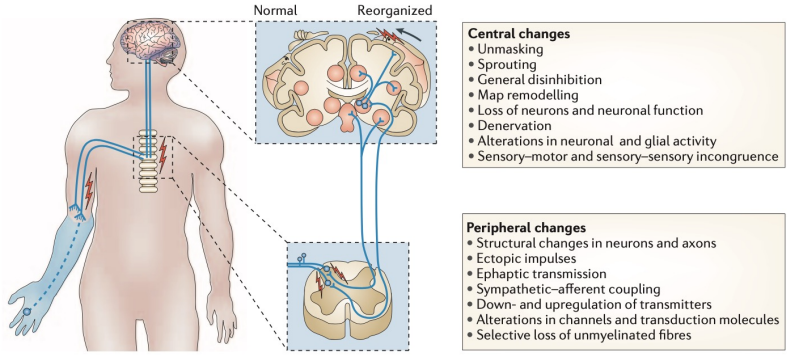
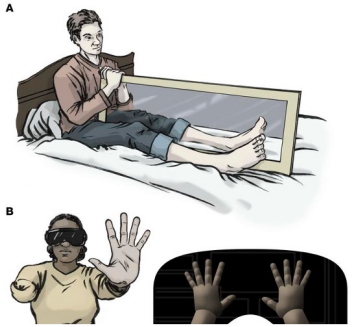


Figure 1 | **A schematic diagram of the areas involved in the generation of phantom limb pain and the main peripheral and central mechanisms.** The peripheral areas include the residual limb and the dorsal root ganglion, and the central areas include the spinal cord and supraspinal centres such as the brainstem, thalamus, cortex and limbic system. The proposed mechanisms associated with phantom pain are listed for the PNS and CNS.

Psychological factors do not seem to contribute to the causation but may instead affect the course and severity of the pain. Sodium channel blockers (gabapentin and pregabalin) and tricyclic antidepressants are the treatments of choice. Ketamine, topical lignocaine and capsaicin have been shown to reduce PLP. Mirror therapy is non-invasive, inexpensive and is effective in reducing PLP and enhances ability to move the phantom limb.



A. Mirror therapy. Amputee moves the intact right limb in front of a mirror to create a visual representation of the missing limb while simultaneously moving the phantom limb
B. VR therapy. Virtual image of missing limb is viewed with googles and amputee replicates the movements with his/her phantom limb

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A majority of patients experience PLP after amputation. Current evidence for prevention of PLP and pharmacological therapy for established PLP is lacking. Most clinicians adopt a pragmatic approach to the treatment of PLP. Preventive strategies include good surgical technique to optimise prosthesis fitting and regional anaesthesia to reduce perioperative pain. Multimodal therapy by an interdisciplinary team should be carried out to treat PLP. This includes pharmacotherapy with medications used to treat neuropathic pain and mirror therapy to modulate pain responses from the phantom limb.

References

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